

I hereby give notice that a hearing by commissioners will be held on:

Date: Monday, 15 May 2023
Time: 9.30am
Meeting Room: Uxbridge Theatre
Venue: 35 Uxbridge Road, Howick, Auckland 2014

APPLICATION MATERIAL

SECTION 92 DOCUMENTS – VOLUME 4

**5 REEVES ROAD, PAKURANGA HEIGHTS (EB2);
207 TI RAKAU DRIVE, PAKURANGA HEIGHTS
(EB3R)**

**AUCKLAND TRANSPORT IN CONJUNCTION
WITH EASTERN BUSWAY ALLIANCE**

COMMISSIONERS

Chairperson Sarah Shaw
Commissioners Ian Munro
Nigel Mark-Brown

**Patrice Baillargeon, Senior Hearings Advisor
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Note: The reports contained within this document are for consideration and should not be construed as a decision of Council. Should commissioners require further information relating to any reports, please contact the hearings advisor.

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10 NOVEMBER 2022

FINAL S92 RESPONSE FOR EB3R

10 November 2022

Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

Attention: Warwick Pascoe

Dear Warwick

Re. Response to Council further information requests for the EB3R Application Package

I am writing in regard to Auckland Council's (the Council) further information request letter of 9 September 2022 for the Eastern Busway 3 Residential (EB3R) application package. Please note that a separate response has been provided to Council in regard to the Eastern Busway 2 (EB2) package.

AT has reviewed the Council's letter and has identified those matters which it considers need addressing prior to the limited notification of the EB3R's resource consent application. These matters are limited to:

- Response to request for examples of habitat restoration plans (HRPs) and Urban Design Landscape Plans (UDLPs)
- Relationship of EB3R to Council reserves
- Industrial trade activities (ITAs)
- Construction and operational noise
- Urban design
- Confirmation of consent triggers associated with wetland/stream works under both the Auckland Unitary Plan (AUP(OP)) and the National Environmental Standards for Freshwater (NES:F), as well as associated ecological assessment
- Earthworks.

It is AT's position that the other matters raised in the Council's letter do not materially affect the ability for potential submitters to understand the scope, location and scale of works proposed by the resource consent application. Responses to these other matters will be provided in late November and includes the following topics:

- Arboricultural effects management
- Social impact assessment
- Detailed methodologies for intersection, busway and cycleway design.

Based on the above approach, AT provides the following responses in relation to Council's queries¹.

Planning

12. *Please provide a collated set of plans that identify construction works including, but not limited to:*
- a. The extent of earthworks proposed as part of construction, including details of cut and fill (referenced in the Earthworks and Streamworks discussion);*
 - b. The extent of earthworks located in or within 100m of a natural wetland (referenced in the Earthworks and Streamworks discussion);*
 - c. The extent of mangrove removal; and*
 - d. The extent of vegetation clearance located in or within 10m of a natural wetland.*

A consolidated set of drawings is provided as **Attachment 1**. These drawings show the outfall works proposed as part of EB3R, construction access and construction footprint.

13. *Notwithstanding the information sought by specialists in the following requests in this regard, in order to understand the scope and level of detail proposed to be provided within the Habitat Restoration Plan (which compliments the Lizard Management Plan) and an Urban Design and Landscape Plan (UDLP) in particular, please provide examples of such plans that have been recently prepared by AT.*

AT considers that the proposed condition set for EB3R provides sufficient detail for Council specialists to understand the objectives, content and enforcement of these management plans. The conditions are sufficient to understand the measures that will be employed to address the Project's landscape and ecological effects. The use of proposed conditions for these purposes is a common approach used when processing and assessing significant infrastructure projects across New Zealand. We understand that Council's specialists should also be familiar with this approach given their experience on other infrastructure projects in the Auckland Region.

In addition, we note that such plans are often bespoke in content, in that they are drafted in a manner which reflects both a project's individual effects and the unique characteristics of the receiving environment. Given this, and the fact that this is the first urban busway in Auckland within an established area and without the boundary of a motorway, it is doubtful whether any examples taken from other transport infrastructure projects would be useful in Council's understanding of EB3R's proposed plans.

Given the above, AT considers that the provision of example plans would not be useful or assist Council's processing of both application packages.

¹ The responses are numbered as they appeared in Auckland Council's own letter.

15. *Information on this parking area(s) is spread between a number of documents and plans. In order to understand the functioning of the parking area and its interface with neighboring properties and streetscape in both configurations, please provide consolidated scaled plans which set out:*
- a. The carpark access to enable assessment of the parking area against the relevant access and parking standards within E27 of the AUP:OP;*
 - b. Pedestrian connections between the carpark and the Edgewater Shops the parking area is designed to serve;*
 - c. Landscaping (if relevant); and*
 - d. Boundary treatments with adjacent properties.*
- Please also provide details of any lighting and/or security arrangements for this parking area.*

A plan of the car park is provided as **Attachment 2**, which demonstrates compliance with Chapter E27 of the AUP(OP) and shows the pedestrian connection to the Edgewater Shops. It should be noted that the car park has also been designed to meet AT's engineering standards. Please note that no new lighting is proposed, while existing boundary fencing will be retained around the edge of the car park. Boundary landscaping comprising a mix of grasses, shrubs and trees will be planted. Landscaping for the car park will be confirmed through the development of the Urban Design and Landscape Plan (UDLP), which is a requirement of the UDLP conditions in AT's proposed conditions set.

16. *Please advise the duration the parking area is intended to be used for in its 'temporary configuration'.*

The temporary configuration will be in place for approximately 30 months and the permanent design will be implemented once the new westbound lanes on Ti Rakau Drive are completed.

Industrial Trade Activity (ITA)

It is noted that several queries were raised in Council's further information request letter in relation to the Project and the consenting requirements associated with ITAs. However, following discussions with Auckland Council officers, it has been confirmed that an ITA is not proposed as part of the current EB3R application package based on the AUP(OP)'s definition of an ITA². As such, no further comment is provided in regard to this matter.

Open Space

21. *Please provide mitigation landscaping plans for all open spaces affected. This is typically a requirement under schedule 4 of the RMA. This should be suitably detailed and include general species selections, densities and planting grades/size at the time of planting.*

² The AUP(OP) defines an ITA as: "has the same meaning as industrial or trade process under section 2 of the Resource Management Act 1991 but does not include a production land activity".

A full set of plans addressing landscape, ecological and arboricultural works were provided as Appendix 4 of the AEE. These plans show the inductive type, size, location and site coverage of the landscaping proposed by AT.

AT is conscious that further refinement of these plans is required and will occur through the detailed design phase of the Project, in conjunction with Auckland Council Parks team, the Council's arborists and mana whenua. This is provided for by the proposed conditions set, which requires the preparation and certification of an Urban Design and Landscape Plan (UDLP) prior to the commencement of related construction activity. The UDLP includes the following specific requirements:

- Landscape design details for works at:
 - Riverhills Park
 - Within Ti Rakau Drive.
- A maintenance plan and establishment requirements over a three-year period for landscaping and five years for specimen trees following planting.

Furthermore, the proposed condition set requires that AT organise a final handover and site walkover with Auckland Council representatives to confirm that all landscaping and urban design works have been undertaken as previously certified. This handover will also identify where, if required, any planting requires further maintenance or other actions to rectify landscaping in poor condition.

The proposed conditions also require the above-described landscaping to be undertaken during the first planting season following EB3R becoming operational. If the weather in that planting season is unsuitable (as determined by Council), then planting must occur at the next practicable opportunity.

The UDLP conditions should also be read in conjunction with the ecological and arboricultural conditions, including the requirements for a habitat restoration plan (in relation to herpetofauna) and a tree protection management plan (TPMP). These conditions, in association with the UDLP, demonstrate a robust mitigation and management approach by AT. The conditions impose strict timing, certification and implementation timeframes, as well as the objectives of the various plans.

As such, AT considers that adequate information in regard to open space landscaping (that complies with the requirements of Schedule 4) has been provided at this time.

22. Please show how you have addressed low speeds and traffic control or pedestrian rights-of-way for roads adjacent to parks, especially where there are sport clubs.

With regard to EB3R, works are proposed in proximity to and within both Ti Rakau Park and Riverhills Park. It is noted that at Ti Rakau Park, the majority of works have been previously addressed by the resource consent application for the extension to the William Roberts Road extension (Council Reference: LUC60401706).

It is noted that EB3R will improve pedestrian and cyclist safety in the vicinity of Riverhills Park. The proposed works will provide dedicated walking and cycling connections to Ti Rakau Drive, as well as signalized pedestrian crossings. These new works will reduce the need for active mode users to enter the road carriageway. Furthermore, no changes are proposed to the existing vehicle access to Riverhills Park given the location of the vehicle accessway and car park outside the EB3R footprint.

23. *Please explain how safe public access will be retained throughout the construction period to open spaces and esplanade reserves.*

As detailed in Section 7.4 of the submitted AEE, EB3R will be subject to a Construction Traffic Management Plan (CTMP). The objective of the CTMP is to identify the means to be used to avoid, remedy or mitigate the adverse effects of construction of the Eastern Busway Project. A draft of the CTMP was provided as Appendix 10 of the AEE and includes the following hierarchy of measures in relation to pedestrian/cyclist access (including to open spaces):

1. Carry out construction whilst maintaining access to existing footpath with no impact to pedestrians
2. Realign or redirect the facility onto temporary surfacing on the same side of the road
3. Close the footpath, with an alternative footpath provided on the opposite side of the road. Safe crossing points will be provided and signage
4. Temporarily close the facility, with an alternative route signposted and communicated to the public.

Please refer to the draft CTMP for further detail regarding specific pedestrian and cyclist access interventions.

24. *Please explain whether the directly affected sports fields (i.e., Ti Rakau and Riverhills), will be able to be used during construction, and whether there are any proposals to relocate the clubs during construction? And if so, for how long? Please also explain how the construction will affect parking around these clubs.*

It is envisaged that both parks will be operable during construction. EBA have been meeting regularly with both Pakuranga Jaguars (Ti Rakau Park) and Fencibles United (Riverhills Park) and EBA have developed a good working relationship with both clubs.

The Project has been discussed at length with the Pakuranga Jaguars Rugby League Club. EBA will continue to engage with this club through the Project's detailed design phase, including in relation to the provision of parking and access to the clubhouse, as well as in relation to relevant management plans (e.g. Construction Environmental Management Plan (CEMP) and CTMP) There is no proposal to relocate this club.

Upgrades to the fields within Riverhills Park will take place in the off season to mitigate any disruption to Fencible United AFC. EBA have been meeting regularly with this club to clarify their needs and logistics and to date there has been nothing identified that would necessitate relocating the club. Parking will not be affected, given the works within the Riverhills Park are away from the car park.

The management of the Project's construction traffic effects will be addressed in the CTMP, with a draft CTMP provided with the EB3R application package.

25. *Please explain how the bus stations and shared used paths integrate with the existing open spaces where it may have severed the open space.*

The Project does not sever access to public open space. The Project will provide improved walking and cycling connections to Council reserves. The Project will also provide improved public transport connections to these parks, given the provision of new bus stations, dedicated bus lanes and changes to bus service routes.

Please refer to the submitted arrangement plans (Appendix 4 of the AEE) which show these improved active and public transport connections.

Social Impact Assessment

AT and EBA have reviewed the questions posed by Auckland Council's technical reviewer. It is considered that many of these questions relate to a differing of professional opinion regarding the methodology and reporting style employed rather than any matters fundamental to either understanding the potential social effects of the Project or the mitigation proposed. Furthermore, and as discussed at the meeting of 18 October 2022, the matters raised by the SIA technical reviewer (Queries 26 to 42) are not material to the limited notification of EB3R and can be addressed at a later date. On this basis, AT are currently preparing a separate document which addresses the following matters, which will be provided independently of this s92 response letter:

- Vulnerable groups
- Impact Summary tables
- Extent and duration of works
- Polymer Plant plan
- Conditions Map.

It is noted that at the time of writing, AT has acquired all full sites needed within EB3R and only has four outstanding partial acquisitions to complete.

Construction Noise and Vibration

45. *The construction noise and vibration assessment includes an assessment of effects across several sections but most comprehensively in section 7. The appendices include large tables of receiver addresses and predicted noise and vibration levels for various phases of work. It is difficult to combine these parts of the document to determine the overall magnitude of construction noise and vibration effects that are likely to be generated by the project.*

Please provide a chart or other method of showing the number of receivers that are predicted to be exposed to different levels of effects.

The objective of the request is to provide a clear and understandable description of the overall magnitude of construction noise and vibration effect that the projects will have, by level, effect and number of receivers. For example, Table 12 could have a column added that sets out the approximate number of residential and commercial receivers that are predicted to receive noise levels in each bracket of noise effect. The same could be performed for Table 13 (vibration). This is one suggestion. There may be other methods that could satisfy the request.

Please see below Table 1 below that sets out a range of noise levels at external facades and the number of receivers expected to experience these noise level. Table 12 of the CNV assessment is also reproduced for context as Table 2 below.

AT notes that the objective of the request is to “provide a clear and understandable description of the overall magnitude of construction noise and vibration effect that the projects will have by level, effect and number of receivers.”

While Table 1 is useful for quantifying the number of dwellings where particular noise levels are expected, does not reflect the overall level of noise effects expected at receivers from construction for the entire construction period (i.e. maximum noise levels are not continuous for the entire duration of construction at any one location). For example, if any given dwelling is unoccupied during the works (as we expect a number of dwellings to be when construction is taking place during daytime hours, given that those affected will be provided advance warning of works as a requirement of the CNVMP), then these noise effects will be adequately managed at that dwelling. Other mitigation and management measures are detailed in the submitted noise and vibration assessment, while noise effects must be considered in the context of the duration of an exposure. As discussed in Section 9.1 of the CNV assessment, the majority of works will not remain in one location continuously. Rather, these works will progress linearly across the Project’s alignment, so that noise levels will reduce at a given receiver as the works move away. Longer term works in any one location are required to meet the noise and vibration standards detailed in the proposed conditions, as well as the requirement for a Schedule where these standards cannot be met³.

³ Condition 37 states:

Table 1 Counts of affected receivers - EB3R

Noise Level at external facade, dB LAeq	Count of receivers affected during worst case scenario (concrete saw, 30% on-time, with mitigation)	Count of receivers affected during typical scenario (excavator, with mitigation)
65 - 70	0	23
70 - 75	33	28
75 - 80	28	13
80 - 85	3	2
85 - 90	8	6

Table 2 Potential noise effects from construction on receivers

External Noise Level	Potential Daytime Noise Effects Outdoors	Corresponding Internal Noise Level	Potential Daytime Noise Effects Indoors
65 dB LAeq	Conversation becomes strained, particularly over longer distances	45 dB LAeq	Noise levels would be noticeable but unlikely to interfere with residential or office daily activities.
65 to 70 dB LAeq	People would not want to spend any length of time outside, except when unavoidable through workplace requirements	45 to 50 dB LAeq	Concentration would start to be affected. TV and telephone conversations would begin to be affected.
70 to 75 dB LAeq	Businesses that involve substantial outdoor use would experience considerable disruption.	50 to 55 dB LAeq	Phone conversations would become difficult. Personal conversations would need slightly raised voices. Office work can generally continue, but 55 dB is considered by the experts to be a tipping point for offices. For residential activity, TV and radio sound levels would need to be raised.
75 to 80 dB LAeq	Some people may choose protection for long periods of exposure. Conversation would be	55 to 60 dB LAeq	Continuing office work would be extremely difficult and become unproductive. In a

Unless otherwise provided for in the CNVMP, a Schedule to the CNVMP (Schedule) shall be prepared in consultation with the owners and occupiers of sites subject to the Schedule, when:

- a) Construction noise is either predicted or measured to exceed the noise standards in Condition 28, except where the exceedance of the LAeq criteria is no greater than 5 decibels and does not exceed:
 - i. 0630 – 2000: 2 periods of up to 2 consecutive weeks in any 2 months; or
 - ii. 2000 - 0630: 1 period of up to 2 consecutive nights in any 10 days;
- b) Construction vibration is either predicted or measured to exceed the Category B standard set out in Condition 30 at the receivers.

External Noise Level	Potential Daytime Noise Effects Outdoors	Corresponding Internal Noise Level	Potential Daytime Noise Effects Indoors
	very difficult, even with raised voices.		residential context, people would actively seek respite.
80 to 90 dB L _{Aeq}	Hearing protection would be required for prolonged exposure (8 hours at 85 dB) to prevent hearing loss.	60 to 70 dB L _{Aeq}	Untenable for both office and residential environments. Unlikely to be tolerated for any extent of time.

46. *The appendices demonstrate that some of the receivers are predicted to experience noise and vibration levels that are high enough to cause significant adverse effects. The precise extent (especially for vibration) and approximate duration of the effects are not known. It is therefore impossible to determine whether there are going to be receivers that suffer significant disruption during the works that might last for a period long enough to cause an overall significant adverse effect. Please provide an assessment that:*
- Shows the receivers that are subject to noise and vibration levels that are above the project standards for short periods, (perhaps a few days to a week);*
 - Shows the receivers that are subject to noise and vibration levels that are above the project standards for longer periods, (perhaps 1-4 weeks);*
 - Shows the receivers that are subject to noise and vibration levels that are above the project standards for short periods, (perhaps longer than 4 weeks).*

The duration of exposure to noise and vibration levels above the Project criteria⁴ will be dependent on the specific plant items that are being used for that phase of works, and their proximity to the affected receiver.

For most of the works, it is difficult to quantify the precise number of days any given receiver will be exposed to noise and vibration levels above the relevant criteria at this stage, as most of the works are not fixed in one location and will progress linearly along the Project alignment. There will likely be temporary exceedances when the works take place immediately outside residential dwellings, but noise levels will decrease as the works move along the road corridor.

Residential dwellings that front directly towards the works could experience noise levels that exceed the criteria intermittently for a total of 1-4 weeks over the total duration of the Project, and vibration levels that exceed the criteria intermittently for up to a week in total over the duration of the Project. The works will be managed at these locations through the CNVMP and Schedules, which will help to reduce overall effects.

We expect that noise levels at receivers set back by the first row of residential dwellings from the construction footprint will experience levels above the relevant criteria for only up to a week at any one time. Exceedances of the noise criteria at these receivers may

⁴ The Project criteria are based on the standards of the AUP(OP) and NZS:6806.

occur if line of sight to the works is achieved, but noise will quickly reduce as the works progress. We do not expect the vibration criteria to be exceeded at these receivers.

47. *Please describe the likely degree of effects on the receivers in Categories b and c above so that the overall level of effect can be determined. This assessment might demonstrate (for example) that some businesses or dwellings (near to parts of the project where there is a significant volume of work) are predicted to receive noise or vibration levels above the project standards for long periods, and that the standard noise and vibration measures may not be sufficient.*

Effects at receivers will differ based on the specific uses of the buildings and their construction.

For receivers that directly front towards the linear progression of works, we expect that effects will generally be higher when works are immediately in their vicinity (i.e. directly in front of these sites) but will reduce as the works progress. There may be cases where the works take place in a single location for an extended period of time (i.e. longer than one week), such as for the construction of the retaining walls within Riverhills Park. These works will be managed at these locations through the CNVMP and Schedules, which will help to appropriately manage overall effects.

48. *If the assessment arising from questions 46 and 47 demonstrate that the effects may be significant, (causing business disruption or long term (> several weeks) of serious residential disruption) please propose mitigation measures that could be employed to adequately mitigate these effects. These may include temporary relocation (for example).*

As required, activity-specific Schedules will be prepared in accordance with the requirements of the proposed conditions⁵. The receivers covered in the activity-specific Schedules will likely be those that directly front towards the works that will progress linearly along the Project alignment.

There are a number of mitigation measures that can be implemented where effects may be found to be significant. These include:

- Increased frequency of consultation with affected receivers
- Scheduling of construction activities to avoid sensitive times, where practicable

⁵ Condition 38 states:

The objective of the Schedule is to set out the BPO for the management of noise and/or vibration effects of the construction activity beyond those measures set out in the CNVMP. The Schedule must include but not be limited to details such as:

- a) *Construction activity and location plan, start and finish dates;*
- b) *the nearest owners and occupiers of the sites to the construction activity;*
- c) *the predicted noise and/or vibration level for all receivers where the levels are predicted or measured to exceed the applicable standards in Conditions 28 and/or 30*
- d) *the proposed site-specific noise mitigation*
- e) *the consultation and outcomes with owners and/or occupiers of properties identified in the Schedule; and*
- f) *location, times, and types of monitoring.*

- Unattended and attended noise and vibration monitoring
- Site specific mitigation
- Temporary relocation during disruptive works (for residential receivers only).

The measures listed above (among others) will be considered for each receiver when the Schedules are prepared.

The Schedules will be most relevant during worst-case construction activities. During typical construction activities and as the works progress along the Project alignment, the works will be appropriately managed through the CNVMP including continuous active engagement with receivers, and we consider that the noise and vibration criteria will be complied with at the majority of receivers.

Pre construction assessments will be undertaken as necessary. Where required, long-term vibration loggers will be deployed at affected receivers, and notice of any high vibration generating works in the vicinity of these receivers will be provided in advance of the works taking place.

49. *Please identify any businesses or activities that might be particularly sensitive to vibration due to the equipment they use, processes or products they provide, or where their particular circumstances are such that the construction vibration will cause business disruption. If there are any businesses in this category, please identify appropriate mitigation measures to adequately mitigate the effects.*

No businesses or activities that are particularly sensitive to vibration have been identified along the EB3R alignment.

Operational Noise

51. *Section 5.2.9 of the Operational Noise Assessment sets out that the speed limits in several sections of the existing road are expected within the transport model at the time of growth under the do-nothing scenario. The assessment goes on to state that this speed limit reduction has not been included in the do-nothing predictions for the Design Year because, "NZS 6806 states that the Do-Nothing scenario should include no alterations to the roads assessed."*

The relevant clause of NZS6806:2010 is the definition of 'Do-Nothing' in section 2.2. Section A2.2 contains helpful text for a worked example. The definition of do-nothing is (emphasis added) : The predicted road traffic noise level at the assessment position(s) of protected premises and facilities and the design year assuming no alterations are made to the existing road.

The text in A2.2 (for the worked example) states (emphasis added): Using an appropriate noise model ... predict noise levels for the design year taking into account the future traffic flow (AADT), and assuming no alterations are made to the existing road layout.

The text in A2.2 makes it clear that an 'alteration' is a physical change to the layout. The operational noise assessment suggests that altering the speed limit is an alteration to the existing road, and so has excluded it from the do-nothing scenario. This is inconsistent with NZS6806:2010.

If the future alteration to the speed limit in the do-nothing scenario is not incorporated in the do-nothing scenario, but is in any of the future design scenarios, the assessment of noise effects will automatically show that any design scenario will generate lower noise levels than the do-nothing, because the speed limit drop is incorporated. This is artificial and misleading. If the project does not go ahead (i.e. the do-nothing) the speed limits will drop before the design year and the noise levels will reduce. This is an actual and predicted change that should be incorporated in the do-nothing scenario, just like traffic growth over time is incorporated.

Please adjust all of the do-nothing noise level predictions to take into account the speed limit reductions that will occur with growth. This will lower the noise levels for the do-nothing scenario across large parts of the project and will allow a true and accurate description of the actual change in noise level and effect that will arise for the various options when compared to the do-nothing. Once the do-nothing noise level predictions are adjusted, it is expected that there will be a number of consequential changes required throughout the assessment (such as Figures 7 and 8, much of the accompanying text).

The speed limit drop has been incorporated in the model based upon Phase 3 of the "Safe Speeds Programme". The relevant text, tables and graphs in the report have been updated accordingly

We note that the speed limit corrections only resulted in 1-2 dB changes across the model at some Protected Premises and Facilities (PPFs), therefore the outcome of the assessment did not change. We have appended a table to this letter showing the updated noise model results (**Attachment 3**).

52. *Section 5.5 states that the noise level assessment for buses has been undertaken on the basis that 100% of the bus fleet will be electric in the Design Year (2048). The design year is approximately 26 years away. Allowing for the construction phase, there may be 20 years of use of the roads before the Design Year arrives. This is a significant period of time. It is expected that there will be a transition in the bus fleet from diesel to electric that will occur over time. However, it is not known when that transition will start or how long it will take.*

Please provide some insight into the probable amount of time it will take for the bus fleet to transition to 100% electric. If that time is more than 1-2 years from the opening of the busway, please provide an assessment of bus noise using 100% diesel fleet and perhaps a 50% diesel / 50% electric fleet. This will enable the effects of buses over the next 26 years to be properly understood. This request includes the busway generally and the specific effects around the bus stops.

EBA has advised that the bus fleet travelling from Botany to Reeves Road is expected to be approximately 50% diesel / 50% electric up to 2035, after which the fleet is expected to be 100% electric.

The results of the assessment of noise from buses travelling along the busway will be valid regardless of the distribution of electric and diesel buses, as above approximately 50 km/h, it is tyre noise and wind noise that dominates over engine noise (which will be the same for both diesel and electric buses).

Regarding noise from diesel buses at bus stops – the study referenced in the report (Laib et. al.) reported a sound power level for the diesel bus 7 dB higher than that provided for the electric bus, i.e. 90 dBA SWL. This would correspond to a noise level of 54 dB L_{Aeq} at the façade of 2/2 Chevis Place (the closest PPF to a bus stop, approximately 25m away). This is equal to the measured ambient noise in the area during the night-time period and is significantly below the measured ambient noise in the area during the daytime period. We therefore consider that noise from diesel buses idling at bus stops will not appreciably change the existing ambient night-time noise environment along Ti Rakau Drive, and so we consider that noise effects from diesel buses idling will be negligible.

53. *Section 5.6 of the assessment contains a very brief assessment of the noise effects of the project. Please provide a meaningful and sufficiently detailed assessment of the noise effects that refers to, and explains the effects of the project against, the objectives of the World Health Organisation Environmental Noise Guidelines for the European Region (2018) and the specific recommendations for road traffic noise. This should include any statistical analysis to demonstrate how the predicted noise levels compared to the recommendations. The assessment may also refer to other publications or research such as Miedema and Oudshoorn*

The World Health Organisation Environmental Noise Guidelines for the European Region (WHO ENG) provides recommendations to protect human health from exposure to environmental noise generated from a range of sources, one of which is traffic noise. The study sets out noise levels of 53 dB L_{den} and 45 dB L_{night} at which onset of adverse health effects begin to arise in populations. Converting between L_{den} and L_{night} to the $L_{Aeq(24h)}$ metric used in the noise assessment⁶, this threshold level for onset of noise effects is approximately 50 dB $L_{Aeq(24h)}$ for traffic noise at the most exposed façades of buildings.

In line with this, an updated set of noise contour maps showing the 50 dB $L_{Aeq(24h)}$ noise contours for the chosen mitigation option are provided as **Attachment 4**. The mitigation proposed now also includes an additional noise wall for 148 Edgewater Drive⁷.

⁶ $L_{Aeq(24h)} = L_{den} - 3$ dB, $L_{Aeq(24h)} = L_{night} + 6$ dB, as per Brink, M., Schäffer, B., Pieren, R., & Wunderli, J. M. (2017). *Conversion between noise exposure indicators L_{eq24h} , L_{Day} , $L_{Evening}$, L_{Night} , L_{dn} and L_{den} : principles and practical guidance. International Journal of Hygiene and Environmental Health.* <http://doi.org/10.1016/j.ijheh.2017.10.003>. The worse-case noise level of 50 dB $L_{Aeq(24h)}$ from conversion of the L_{den} criterion is referenced.

⁷ Condition 83 has been updated to include this additional noise wall.

In summary, a total of 209 PPFs in the Do-Nothing scenario and 243 PPFs in the chosen mitigation option are predicted to have noise levels above 50 dB $L_{Aeq(24h)}$, out of 273 PPFs across EB3R.

A total of 39 PPFs within the assessment area are predicted to have an increase in external noise level that brings the level at the worst-affected façade to 50 dB $L_{Aeq(24h)}$ or above when comparing the chosen mitigation option and the Do-Nothing scenario. Of these 39, 24 are predicted to have a noise level increase of 3 dB or greater.

Noise levels are predicted to reduce below 50 dB $L_{Aeq(24h)}$ from the Do-Nothing scenario to the chosen mitigation option at 5 PPFs.

Although a number of PPFs are predicted to receive noise levels above 50 dB $L_{Aeq(24h)}$ where health effects may begin to occur, we note there are some limitations to the data that must be considered.

For example, the highest noise level at a given PPF is along the façade facing the road, which may not have any bedrooms. Night-time noise effects will be overestimated if bedrooms are set further back within the house. The construction of buildings must also be considered; some buildings will have facades that better insulate from noise than others, and where a building has mechanical ventilation, windows may be shut while a supply of fresh air is maintained. These factors could lead to noise levels higher than 50 dB $L_{Aeq(24h)}$ being acceptable at the façades of buildings.

Also, health effects from noise are difficult to predict at a single receiver, since the likelihood of onset of health effects from noise will vary from person to person depending on a range of factors, e.g. age, ethnicity, co-morbidities etc.

Nevertheless, a separate scenario has been modelled where 2m high noise barriers are implemented at PPFs where the noise level with the chosen mitigation option is above 50 dB $L_{Aeq(24h)}$, and where the noise barriers will be effective, i.e. do not require gaps for driveways. In this scenario, only 1 additional PPF had its predicted noise level brought down below 50 dB $L_{Aeq(24h)}$. However, these barriers were not considered BPO mitigation as the noise reductions were in all cases only by 1 dB or less, and this PPF was already set back behind other PPFs.

Even though the modelling indicates that noise levels are not reduced to below 50 dB $L_{Aeq(24h)}$, this does not mean there is no benefit in reducing noise levels at PPFs. When considering the project at a high level, by reducing noise levels across the project where practicable via the measures set out in the CNVMP and Schedules, the likelihood of health effects arising is also reduced.

54. *The assessment of the effectiveness of road-side barriers discounts them entirely because they do not screen the upper storeys of multi-storey buildings. This ignores the potentially significant benefit that barriers can have on rooms at the ground floor and also the outdoor living environment.*

Please provide more informative comment on the actual and potential benefits of barriers in a more holistic sense, that includes the potentially significant benefits at lower levels. The evaluation of the utility of barriers should be revised to have proper regard to the potentially significant benefits they can have at the ground floor.

Noise barriers were not investigated further at double-storey PPFs as they did not provide the required noise reductions at the assessment position of the PPFs (as defined in NZS 6806, i.e. the exterior wall most affected by noise from the altered road, 1.2-1.5m above each floor level of interest), and therefore did not change the Category of those PPFs.

While we acknowledge that noise at the outside and ground floor of PPFs will reduce if noise barriers are included at double-storey PPFs, we do not consider them to be BPO mitigation when considered in the implementation framework of NZS 6806.

However, in response to the question, we have now considered noise barriers at two-storey PPFs in NZS 6806 Category B or C that could benefit in noise reductions at the ground floor.

There were 19 PPFs across EB3R that were predicted to be in either Category B or C in the Do Minimum scenario and were double-storey. However, all of these PPFs had a driveway facing the road, such that the PPFs would be able to achieve line-of-sight to the roads at ground floor even with the noise barrier and would therefore have their performance compromised. Noise barriers were not considered further at these PPFs.

55. *The proposal involves the removal of a number of buildings to make way for the project. New traffic lanes will be constructed on many of the properties that will be vacated. This will expose the houses immediately behind to greater levels of road-traffic noise. In some cases, the increase will be significant.*

The noise assessment appears to rely on future development on the residual land to provide a degree of screening to mitigate the effects. However, it is not certain that the residual land will be large enough or reasonably able to accommodate future dwellings that will adequately screen the existing dwellings.

a. Please demonstrate that it is certain that the residual land will be large enough and reasonably able to accommodate buildings that will adequately reduce the noise to existing dwellings;

b. If it is not certain that development on the residual land will deliver the outcomes in (a), demonstrate what the Best Practicable Option will be to mitigate the effects and achieve a reasonable level of noise. This should include an assessment of screening options that includes the following:

- An assessment of screening from barriers, acknowledging the significant positive effects they can have on ground floor and yard spaces;*
- An assessment against NZS6806 and the relevant recommendations of the World Health Organisation's Environmental Noise Guidelines for the European Region (2018).*

All mitigation options modelled as part of the NZS 6806 assessment assumed that the residual land would remain vacant and would not be developed. Also, effects from changes in noise levels at PPFs were assessed when comparing the Do Nothing and chosen mitigation option without the assumption that residual land would be developed.

AT is not relying on the development of residual land to mitigate noise effects from the Project.

Transport Assessment

AT has reviewed the transport queries raised by Council and considers that responses to these queries are not required prior to the limited notification of EB3R. This is due to their lack of impact on the required footprint of EB3R or on the quantum of transport effects generated by the proposed works. Furthermore, the mitigation and management methods proposed by AT (such as a CTMP) will remain largely unaltered by the planned responses to these queries. As such, AT plans to respond to these transport queries during November in a separate response to Council.

Urban Design

81. *Should an Auckland Urban Design Panel review not be advanced, please advise on:*
- a. the details of the methodology undertaken through AT's own internal expert review process to address such issues,*
 - b. other reasons as to why a review by the Auckland Urban Design Panel isn't necessary, and/or*
 - c. further detail on the "Urban design details for works" as set out in the Urban Design and Landscaping Plan proposed as mitigation.*

In addition to and as discussed in response to the open space queries, AT is required to provide an UDLP to Auckland Council for certification prior to the commencement of related construction activities. This is a standard approach employed on major transport projects in Auckland. Please refer to the open space queries earlier in this letter for further detail regarding the UDLP and the measures that will be employed to address the Project's visual, landscape and urban design effects.

It is also noted that the urban design process for the Project is discussed in depth by the AEE (Sections 3.2.5 and 7.5.2), and in the Natural Character, Landscape and Visual Effects Assessment (Appendix 18 of the AEE). These documents highlight the various urban design and landscape interventions employed by the Project, while the Project's landscaping elements are also illustrated by the Landscape, Ecological, and Arboricultural Plans (Appendix 3 of the AEE). AT considers that these documents are adequate to enable Auckland Council to assess the visual, landscape and urban design effects of the Project.

Given the above, AT does not consider that the Project requires review by the Auckland Urban Design Panel. It would be highly unusual for a transport project of this type to appear before the Panel and it is noted that the Panel is better suited to assessing

residential/commercial building developments rather than transport infrastructure. It is AT's view that the current Project does not differ from any other infrastructure project so as to require it to go before the Panel.

88. *Please provide urban design information in the AEE on how the project, its stations and streetscape will address the future public realm / private land interface, which will be developed to substantially greater scale and intensities under the IPI plan changes.*

Given the proposed status of Plan Change 78 and the limited scope of the permitted activity provisions with immediate legal effect, AT considers it inappropriate to undertake a detailed assessment of the Project in relation to what are currently hypothetical development scenarios that are not part of the existing environment (as defined by the RMA).

Regardless, AT notes that the Project enables further intensification, as enshrined by the Project's own objectives and highlighted throughout the AEE. Please refer to these documents for further detail.

89. *Please provide information on the ecological re-planting of the (coastal) wetland and its margins and the stream riparian margins, to include larger specimens further from the water's edge.*

AT propose to implement a habitat restoration plan (HRP) as detailed in the proposed conditions set (Conditions 75 to 77). The HRP has been proposed given the potential effects on native lizard species, particularly given the works proposed around coastal margins. The purpose of the HRP is identified as:

"detail the site-specific lizard habitat restoration measures which addresses the impacts of the Eastern Busway Project (Package EB3R) on lizard habitat as identified within the 'Eastern Busway: Ecological Impact Assessment report'".⁸

The HRP is required to have the following information:

- Identification of restoration areas to a quantum of 0.3 ha
- Details of planting design, supplementary lizard refuges and other measures to enhance lizard habitat
- A programme of maintenance and pest management for a minimum of three years
- A schedule identifying selected native plant species, with a preference on Auckland eco-sourced plantings.

Further detail of EB3R's landscaping will also be provided as part of the as part of the UDLP following further engagement with Council Parks and mana whenua. The UDLP will be

⁸ Condition 76.

subject to certification by Auckland Council and it is that certification process that is considered the appropriate time to provide the requested information.

Lastly, it should be noted that the esplanade reserves will be retained in Auckland Council ownership and works at these locations will be subject to asset owner approval, which may impose other planting requirements on the Project.

90. *Please confirm that the Applicant considers the proposed Edgewater and Gossamer intermediate stations and in-road planting and street trees to be a permitted activity as 'public amenities' or 'road network activities', able to be established as part of a permitted baseline.*

As stated in the EB3R AEE AT confirms that the abovementioned works are permitted by the AUP(OP) and should be considered part of the permitted baseline.

91. *Please confirm there are no new street trees proposed along the northeastern side of Ti Rakau Drive, even though some existing street trees will be removed to create pedestrian and cycle facilities.*

No new trees are proposed at these locations given space constraints within the Ti Rakau Drive corridor. Road corridor space is constrained given the need to accommodate the cycleway, improved footpaths and existing significant underground services. However, it is also considered that the large areas of landscaping proposed alongside the bus lanes and on the southern side of Ti Rakau Drive will provide a positive contribution to the visual amenity values within this section of EB3R.

92. *Please provide an indicative tree and plant species list within the application documents (even though subject to later co-design) and provide in the LEAMP an indication of the scale of the trees proposed at maturity in addition to the planting bag sizes.*

This information will be provided as part of the UDLP (as required by the conditions of consent) and is subject to further development with both Council Parks and mana whenua. The UDLP will be subject to certification by Auckland Council, and it is that certification process that is considered the appropriate time to provide the requested information.

Earthworks and Streamworks

93. *Please provide a drawing showing the overall earthworks for each, EB2R and EB3R areas, that are subject to the E26 infringements and National Environmental Standards for Freshwater (NES-F) Regulations and include with the extent of the 100m setback from all natural wetlands. Please include the location of the access ways to the works areas (e.g. to outfall construction).*

Drawings detailing setbacks and construction access are provided as **Attachment 1**.

94. *It is acknowledged that cut and fill plans have been provided for the central line through the road alignments, and that the retaining wall locations have been provided. However it is unclear what cut/ fill will be required across the site to construct the road alignment and any batters that will be formed at the road edges. Please provide a cut / fill plan view that estimates, and locates, the cut and fill requirements across the entire project's alignment.*

The Concept ESC Drawings and the Consent Plans indicate the extent of works, as well as the cut / fill extent lines.

As described in the Erosion and Sediment Control Effects Assessment technical report, the works will occur on generally flat grade land that is based on existing site contours. Tables 3.1 and 3.2 in that technical report provide breakdown of estimated earthwork areas and earthwork volumes. These tables also indicate the general locations of the cut and fill works and should be read in conjunction with lodged drawings and works descriptions.

In general the works involve the trimming and widening of berms, the excavation and formation of new carriageway including the removal of the central medians, minor cutting of batters, placement of fill and associated drainage, structure placement, and installation of stormwater outfalls.

The main earthworks area is the widening of Ti Rakau Drive, in EB3R. These works are clearly shown on the submitted plans.

The trimming and widening of berms and the removal of the central medians, and minor drainage and services trenching operations will be a cut and rapid cover operation. In addition, large portions of the works are civil operations that do not require earthworks. These works primarily involve milling and resurfacing of the existing road surfaces and existing stabilised areas. The estimated milling volumes have been included in Tables 3.1 and 3.2.

For the other areas of more traditional cut to fill earthworks (stormwater pipeline installation, and the widening of Ti Rakau Drive, cut material will be excavated and removed off site. The imported fill material will be primarily aggregate (regarded as a stabilised product).

95. *As a general observation, the reference / labels used for the stormwater outfalls vary across the documents (e.g. AEE, ecological assessment reports, Erosion & Sediment Control Plan (ESCP) Report, drawings). For ease of reference, please provide a table that identifies the location of each outfall (e.g. a screenshot of the aerial image and address) and the reference relative to each document.*

A table identifying each outfall, the work proposed and related consent triggers is provided as **Attachment 5**. The table identifies that three of the EB3R outfalls MCC108699, MCC108703 and MCC108707 require resource consent under the AUP(OP)'s vegetation

and streamworks rules. These triggers are further detailed in the response to Query 106 and in **Attachment 5**.

It should be noted that the figures shown for vegetation clearance within AUP(OP) riparian yards and coastal areas differ from those associated with NES-F rules given the differing setbacks in both sets of rules (i.e. AUP(OP) setbacks are greater than the 10m setbacks present in the NES-F).

96. *For the purposes of clarity, please use a consistent naming reference for each new outfall, e.g. the proposed outfall near Riverhills Park as part of EB3R is described as “New outfall adjacent MCC_108746”, while the two new outfalls associated with EB2 are described as “Outfall 06-05” and “Outfall 89-18”.*

AT does not propose to alter the naming of the outfalls given they are based on Auckland Council asset records. Furthermore, the current outfall names have been used across a wide range of Project documentation and changing their names could cause significant confusion and other issues associated with the Project’s delivery. Lastly, the outfalls are also clearly identified on the submitted consent drawings and the table provided as **Attachment 5**.

106. *Council’s Specialist – Earth, Streams and Trees has identified additional reasons for consent in association with the NES-F relating to Earthworks and Diversion / Discharge of water during earthworks and Diversion / Discharge, please refer to the attached document (Attachment Two) for further details.*

In light of above, please review and revise the NES-F triggers / reasons for consent as identified in section 5.3.3.

An ecological assessment detailing the in-stream works proposed, as well as both the mitigation and management measures that will be employed is provided as **Attachment 6**. That assessment and the table provided as **Attachment 5** have identified the following further matters for resource consent under Chapters E3 and E26 of the AUP(OP), in addition to those previously detailed in the lodged application documents:

AUP(OP) Rules under Section 9(2) of the Resource Management Act 1991 (RMA)

- Rule E26.3.3.1 (A77) - Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4.

Comment: Outfalls MCC108699, MCC108703 and MCC108707 require the removal of 2150 m² of vegetation within the riparian and coastal areas. As such, they do not comply with Standard E26.3.5.2 and require resource consent as a **restricted discretionary activity**.

AUP(OP) Rules under Section 13 of the RMA

- Rule E3.4.1 (A44) – Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.14 to E3.6.1.23.

Comment: Outfalls MCC108699, MCC108703 and MCC108707 each feature more than 5m of scour management work. As such, they do not comply with standards associated with Standard E3.6.1.14(1b) and require resource consent as a **discretionary activity**.

- Rule E3.4.1 (A44) - Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.14 to E3.6.1.23.

Comment: Outfalls MCC108699 and MCC108703 each involve more than 10 m of stream disturbance. As such, they do not comply with Standard E3.6.1.14(2) and require resource consent as a **discretionary activity**.

No additional NES-F consent triggers have been identified as detailed in **Attachment 5**.

It is noted that these additional matters for consent do not alter the bundled activity status of EB3R, which was lodged as a **non-complying activity**.

107. *Please amend the assessment of effects to ensure it assesses all reasons for consent.*

No amendments are proposed to the AEE given that the effects associated with earthworks and vegetation clearance in proximity to and within wetlands has already been comprehensively assessed by the submitted application documents and by the attached ecological assessment.

It is noted, as per the response to Query 106, that additional consents are required for three outfalls (MCC108699, MCC108703 and MCC108707). The ecological assessment prepared for these works (**Attachment 6**) details the current compromised nature of the three affected streams and that outfall works in these locations are appropriate. Furthermore, the ecological assessment also identifies the construction practices required to manage the outfalls' construction, as well as the offsetting required for the permanent occupation of streambeds.

Both the construction management measures and offsetting requirements have been incorporated into an updated set of conditions (**Attachment 7**). AT considers that the policy assessment of these works is adequately addressed by the existing s104 commentary in the previously submitted AEE.

It is noted that AT has sought to minimise both the disturbance and permanent occupation footprint of these outfalls. This includes a redesign of MCC108699, which results in the outfall structure being moved partially outside of the existing stream channel. The relocation of this outfall is clearly show in Figure 1, with the outfall now located further northwards of the existing stream channel with reduced effects on that stream.

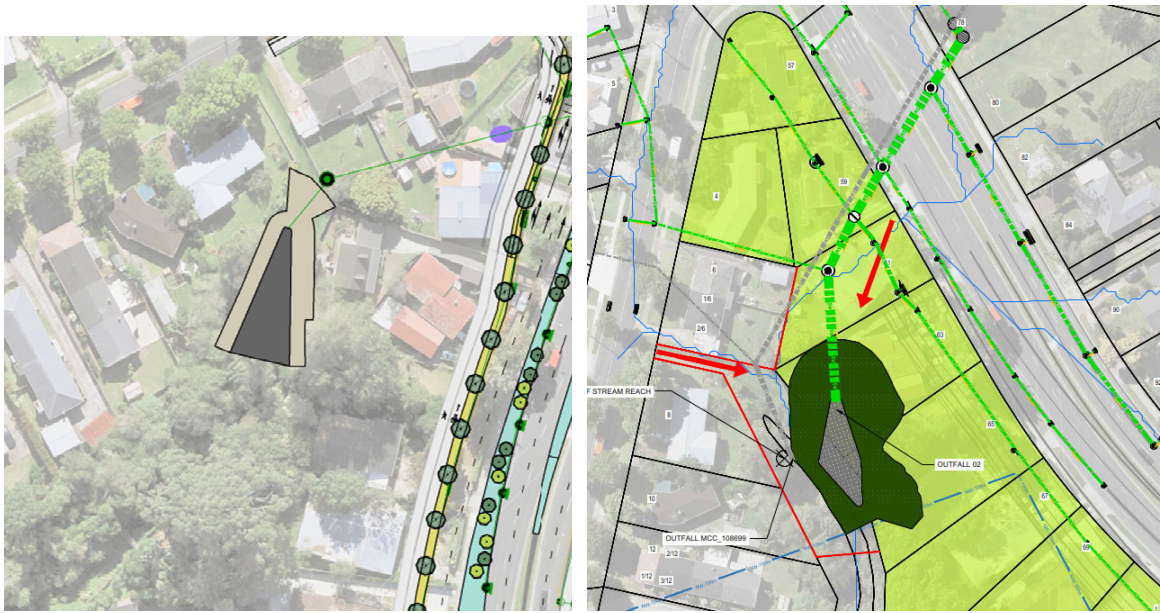


Figure 1 - MCC108699's design as lodged (left) and as now proposed (right)

Lastly, the works associated with outfall construction within the mangrove wetlands have been appropriately addressed by the submitted application documents, including the coastal ecology assessment. Furthermore, the proposed conditions and associated management plans address any potential adverse effects associated with these activities.

Based on the above, no further alterations to the submitted AEE and application documents is necessary.

108. *It is currently unclear whether consent under E3 would be required for the works associated with stormwater outfall and 'vegetated riprap' as shown on the ESCP drawings SK-000011 and SK-000012, which are located adjacent to or within 'streams 3a and 3b' as shown on figure 5-11 of the ecological effects assessment.*

The drawings do not currently identify where the stormwater outfall construction is located in relation to the stream bed or provide the dimensions of the structures.

Further information is required to determine any additional reasons for consent under E3 (and NES-F where applicable) for the EB3R works:

- a. Please locate the stream extent on the drawings to clarify whether works and/or structures will be located within the bed of a stream.*
- b. Please provide the dimensions of the proposed structures located within the bed of the stream on the relevant drawings. (Dimensions of the existing structures would be helpful as a comparison to the proposed structures).*
- c. Please confirm the total length of stream works proposed, as applicable.*
- d. Please assess the proposed structures and works against the rules of chapter E3 of the AUP:OP and (regulations of the NES-F where applicable). Please either:*

- *clarify how the structures / works will meet the permitted activity criteria; and/or*
- *provide an assessment of effects where consent is triggered.*

In each case, please clarify that the structure has been designed to occupy the minimum length / area of stream bed as possible.

Updated outfall drawings are provided as **Attachment 1**, with further details provided in **Attachments 5 and 6**. The additional consent triggers, in relation to streamworks are provided in the response to Query 106. Commentary regarding permanent occupation of streambeds is provided in the response to Query 107.

109. *Regarding construction of the proposed outfalls and vegetated ripraps (including those not associated with a stream); and the new 'naturalised watercourse / swale' at Riverhills Park, it is considered that a silt fence is likely not to be the best option for the management of sediment-laden runoff from the works area.*

In light of the above, please review the proposed sediment controls as shown on the ESC plan.

AT has sought a EB3R land use consent to undertake earthworks across the EB3R construction footprint. While these works will be staged, it is not proposed to stage them in a manner to meet permitted activity standards.

The submitted Erosion and Sediment Control Effects Assessment (Appendix 13 to the AEE) provides a concept of the types of erosion and sediment controls (ESC) that may be employed. These conceptual controls will be confirmed through site specific erosion and sediment control plans (ssESCPs) for each earthworks stage/operation, with the ssESCPs subject to a certification process by Auckland Council⁹.

Given this approach, no further changes are required to the ESC drawings.

⁹ Condition 54 states:

Prior to the commencement of earthworks within a given area or stage, a Site Specific Erosion and Sediment Control Plan (SSESCP) must be prepared in accordance with Auckland Council's Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region Guideline Document 2016/005 ("GD05") and submitted to Council for certification. No earthworks activity within the specific area or stage must commence until the Council has certified that the SSESCP satisfactorily meets the requirements of GD05.

The SSESCPs must contain sufficient detail to address the following matters:

- Contour information;*
- ESC measures for the works being undertaken within a particular construction area;*
- Chemical treatment design and details;*
- Catchment boundaries of works and devices installed;*
- Location of the work;*
- Details of construction methods;*
- Design criteria, typical and site-specific details of erosion and sediment control; and*
- Design details for managing the treatment, disposal and/or discharge of contaminants (e.g. concrete wash water).*

110. *Please identify on the ESC drawings the proposed construction access way to the outfall construction areas. Please ensure this is included within the total earthworks areas (or stream works), as applicable.*

Construction access has been added to the drawings provided as **Attachment 1**. In general, access will be in the immediate location of the outfall and generally run parallel to the stormwater line connecting to the outfall structure. The same construction access will be used to install the pipeline and the outfall.

Each operation / activity will be certified by an ssESCP which will specify (in accordance with GD05) what works are to occur and how they will be managed. Those works will be within the scope of the works proposed in the application and will continue to be low risk from a sediment management perspective.

Lastly, the total “area of earthworks” identified in the technical report includes the total estimated earthworks area, including access tracks and trenching for stormwater related construction. As such, the total area does not require updating.

111. *To understand the potential effects of these works:*

a) Please clarify whether any of these changes will require earthworks and clarify the total area of works proposed.

b) Please identify whether any additional reasons for consent will be triggered as a result of these works (e.g. under the AUP:OP or the NES-F). Where works are proposed to be undertaken as a permitted activity, please demonstrate how works will be managed to achieve permitted activity criteria (e.g. please provide the ESCP for these works).

Firstly in response to Query 111(a), construction access will be in the immediate location of each outfall and generally run parallel to the stormwater line that connects to the outfall structure. The same construction access will be used for pipeline installation and the outfall. This is the same methodology considered by the submitted earthworks assessment and AEE. As such, no additional consent triggers have been identified and all relevant types of resource consents have been sought.

In regard to 111(b), each operation / activity will be certified by an ssESCP that will specify (in accordance with GD05) exactly what works are to occur and how they will be managed. Those works will be within the scope of the works proposed in the application and will continue to be low risk from a sediment management perspective.

Lastly, the total “area of earthworks” identified in the technical report includes the total estimated earthworks area, including potential access tracks. As such, the total area does not require updating.

112. *ESCP Drawing SK-000014 identifies a stormwater line directed to the south of the drawing. For avoidance of doubt, please clarify whether this stormwater line(s) and/or outfall will be upgraded as part of the proposed development. Please update the drawings and provide details where necessary.*

Line 304 runs through the Pakuranga Chinese Baptist Church site and connects to Manhole MCC_75123. No works are proposed to the outfall or the pipe between the outfall and manhole MCC_751243. The ESC for works at this location will also be controlled via a ssESCP based on the certification process previously detailed.

Conclusion

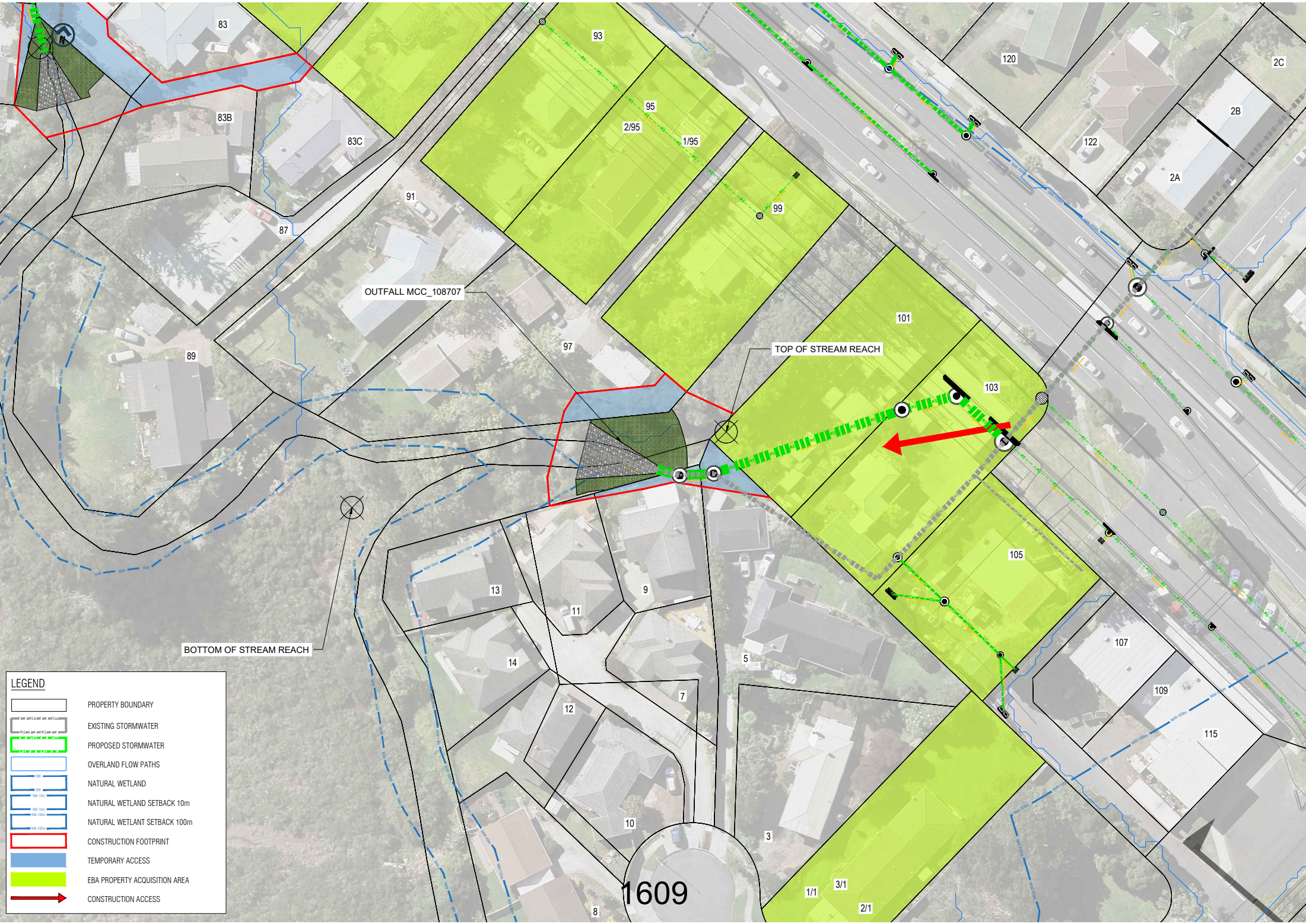
Based on the above points and the attached documents, AT considers that Council can proceed with limited notification of the EB3R resource consents. This is based both on the significant volume of application material previously provided to Council, as well as the additional material provided with this response letter. A thorough assessment of EB3R will be available to notified parties, enabling them to understand the location, purpose, scope and scale of the proposed works, while the remaining Council queries relating to specific matters do not materially affect the overall quantum of effects anticipated.

Yours sincerely



Matt Zame
Alliance Project Director
Eastern Busway

Attachment 1 – Updated Drawing Set



LEGEND

	PROPERTY BOUNDARY
	EXISTING STORMWATER
	PROPOSED STORMWATER
	OVERLAND FLOW PATHS
	NATURAL WETLAND
	NATURAL WETLAND SETBACK 10m
	NATURAL WETLAND SETBACK 100m
	CONSTRUCTION FOOTPRINT
	TEMPORARY ACCESS
	EBA PROPERTY ACQUISITION AREA
	CONSTRUCTION ACCESS

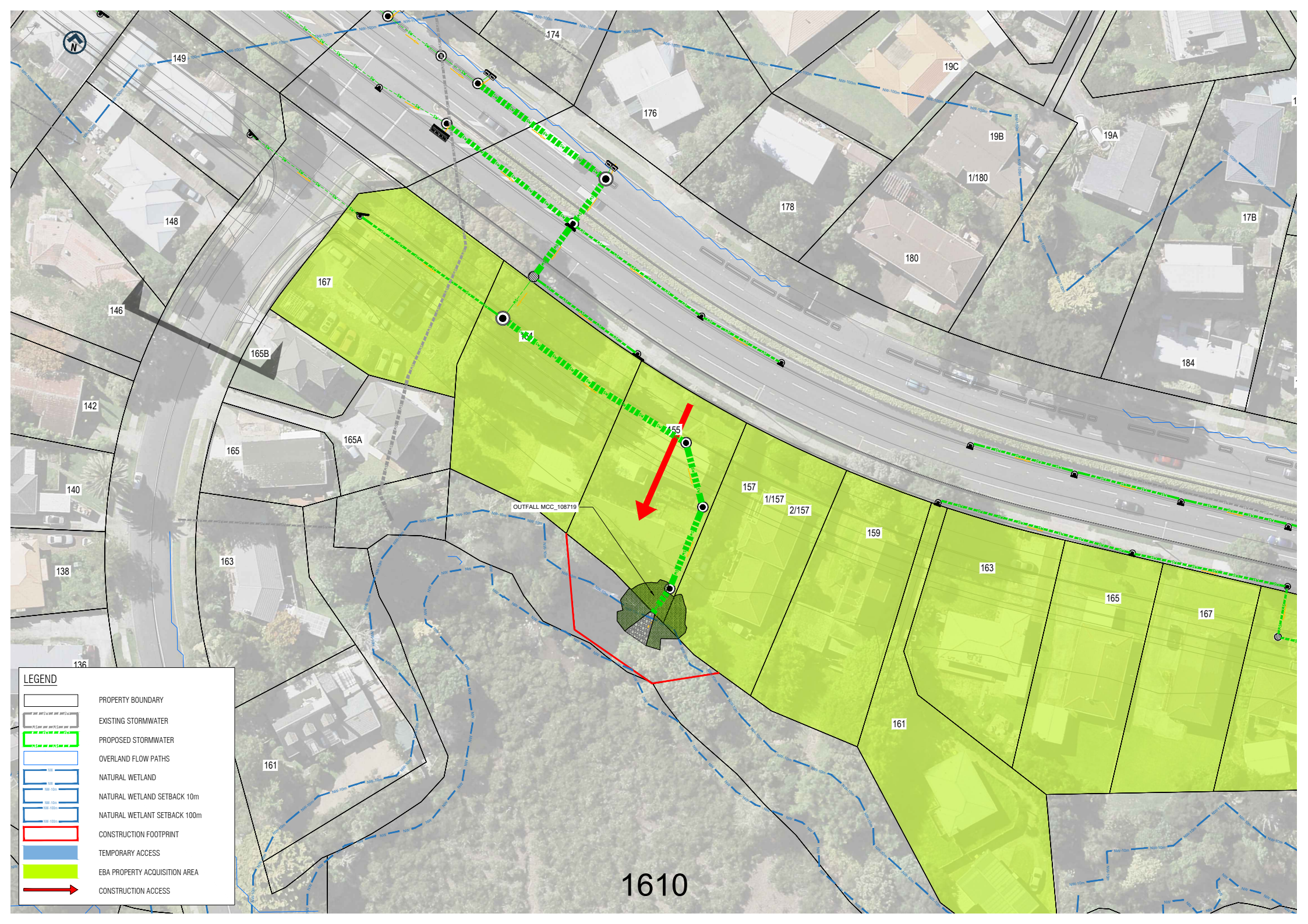
OUTFALL MCC_108707

TOP OF STREAM REACH












BOTTOM OF STREAM REACH

1609

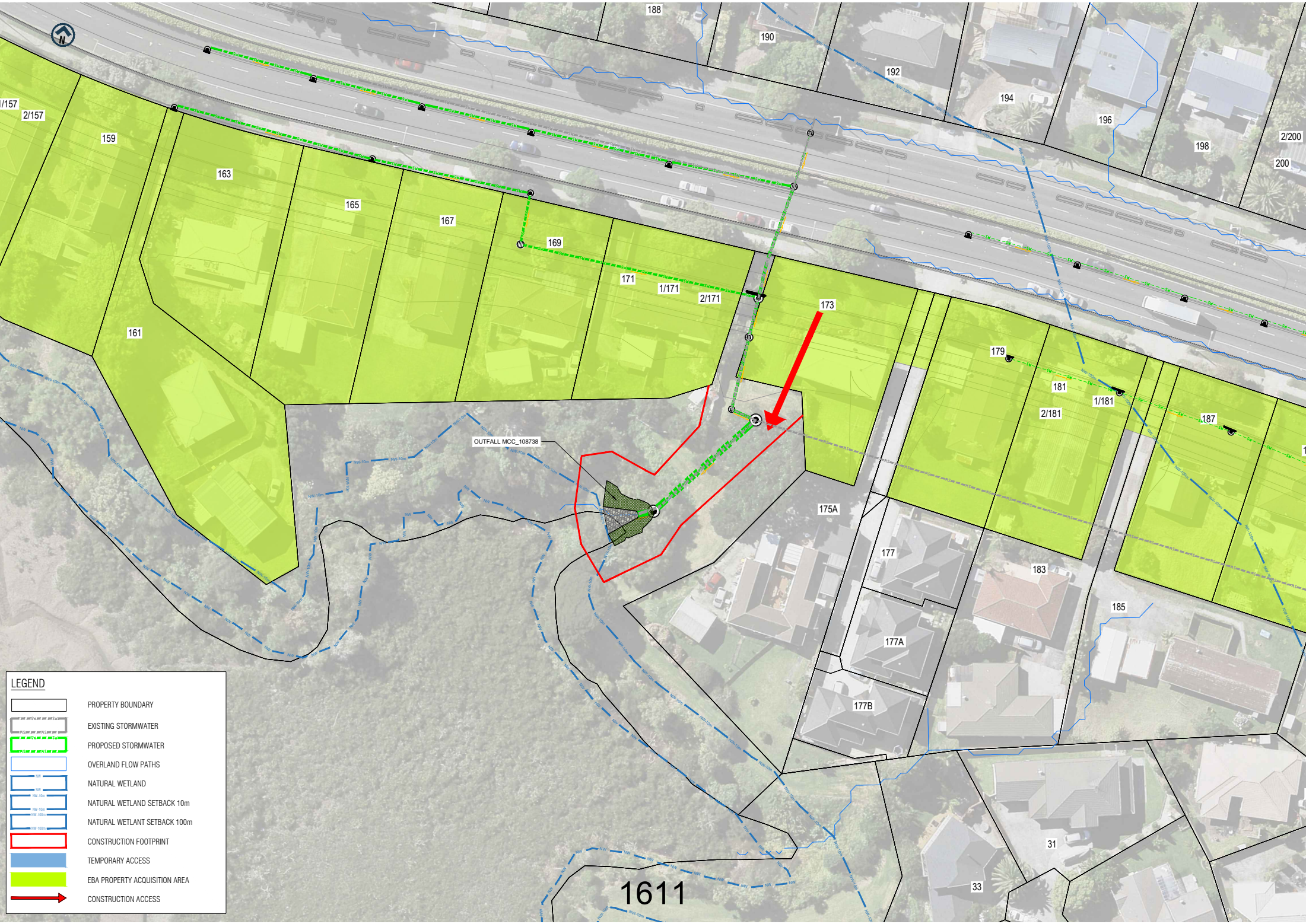
83 83B 83C 91 87 89 97 93 95 2/95 1/95 99 101 103 105 107 109 115 120 2B 2A 122 13 11 9 7 5 3 1/1 3/1 2/1 8 10 12 14 1609



LEGEND

	PROPERTY BOUNDARY
	EXISTING STORMWATER
	PROPOSED STORMWATER
	OVERLAND FLOW PATHS
	NATURAL WETLAND
	NATURAL WETLAND SETBACK 10m
	NATURAL WETLAND SETBACK 100m
	CONSTRUCTION FOOTPRINT
	TEMPORARY ACCESS
	EBA PROPERTY ACQUISITION AREA
	CONSTRUCTION ACCESS

1610



LEGEND

	PROPERTY BOUNDARY
	EXISTING STORMWATER
	PROPOSED STORMWATER
	OVERLAND FLOW PATHS
	NATURAL WETLAND
	NATURAL WETLAND SETBACK 10m
	NATURAL WETLAND SETBACK 100m
	CONSTRUCTION FOOTPRINT
	TEMPORARY ACCESS
	EBA PROPERTY ACQUISITION AREA
	CONSTRUCTION ACCESS

OUTFALL MCC_108738

1611

33

31

175A

177

177A

177B

183

185

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1/181

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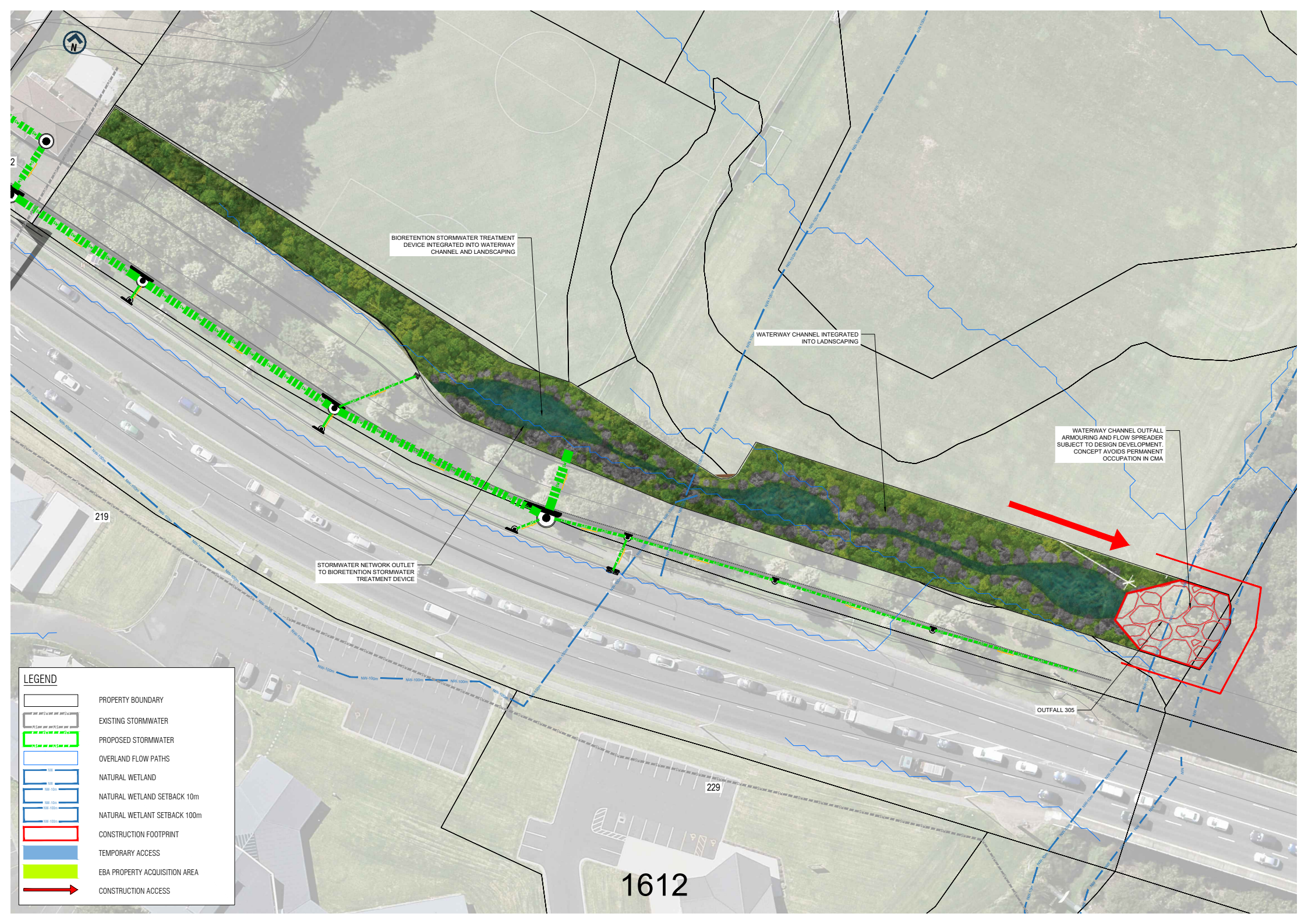
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BIORETENTION STORMWATER TREATMENT DEVICE INTEGRATED INTO WATERWAY CHANNEL AND LANDSCAPING

WATERWAY CHANNEL INTEGRATED INTO LANDSCAPING

WATERWAY CHANNEL OUTFALL ARMOURING AND FLOW SPREADER SUBJECT TO DESIGN DEVELOPMENT. CONCEPT AVOIDS PERMANENT OCCUPATION IN CMA

STORMWATER NETWORK OUTLET TO BIORETENTION STORMWATER TREATMENT DEVICE

OUTFALL 305

LEGEND	
	PROPERTY BOUNDARY
	EXISTING STORMWATER
	PROPOSED STORMWATER
	OVERLAND FLOW PATHS
	NATURAL WETLAND
	NATURAL WETLAND SETBACK 10m
	NATURAL WETLAND SETBACK 100m
	CONSTRUCTION FOOTPRINT
	TEMPORARY ACCESS
	EBA PROPERTY ACQUISITION AREA
	CONSTRUCTION ACCESS

1612

219

229



LEGEND

- PROPERTY BOUNDARY
- EXISTING STORMWATER
- PROPOSED STORMWATER
- OVERLAND FLOW PATHS
- NATURAL WETLAND
- NATURAL WETLAND SETBACK 10m
- NATURAL WETLAND SETBACK 100m
- CONSTRUCTION FOOTPRINT
- TEMPORARY ACCESS
- EBA PROPERTY ACQUISITION AREA
- CONSTRUCTION ACCESS

1613

PLACE

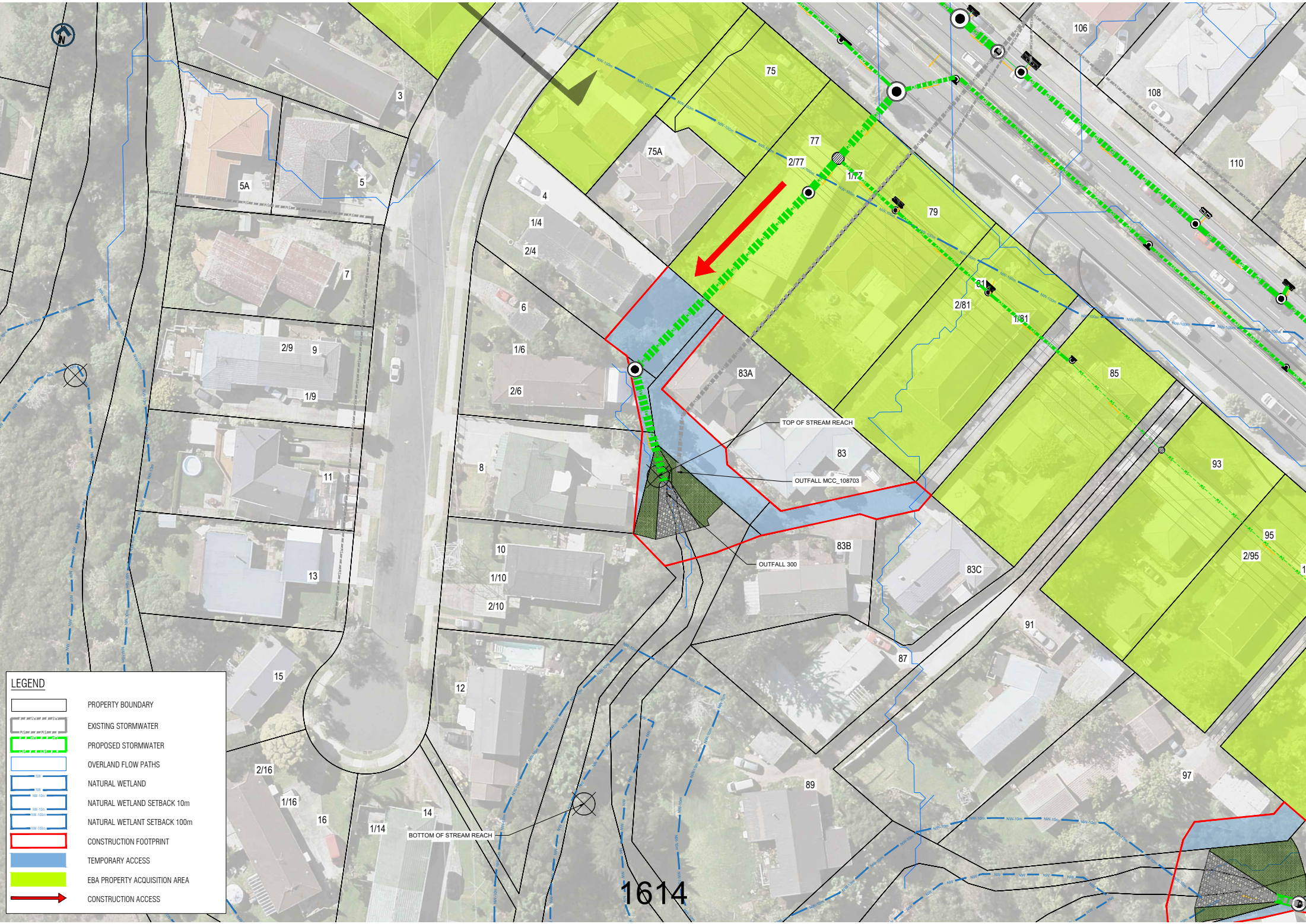
TIIPAKAU DRIVE












TOP OF STREAM REACH

OUTFALL 02

OUTFALL MCC_108699

BOTTOM OF STREAM REACH



LEGEND	
	PROPERTY BOUNDARY
	EXISTING STORMWATER
	PROPOSED STORMWATER
	OVERLAND FLOW PATHS
	NATURAL WETLAND
	NATURAL WETLAND SETBACK 10m
	NATURAL WETLAND SETBACK 100m
	CONSTRUCTION FOOTPRINT
	TEMPORARY ACCESS
	EBA PROPERTY ACQUISITION AREA
	CONSTRUCTION ACCESS

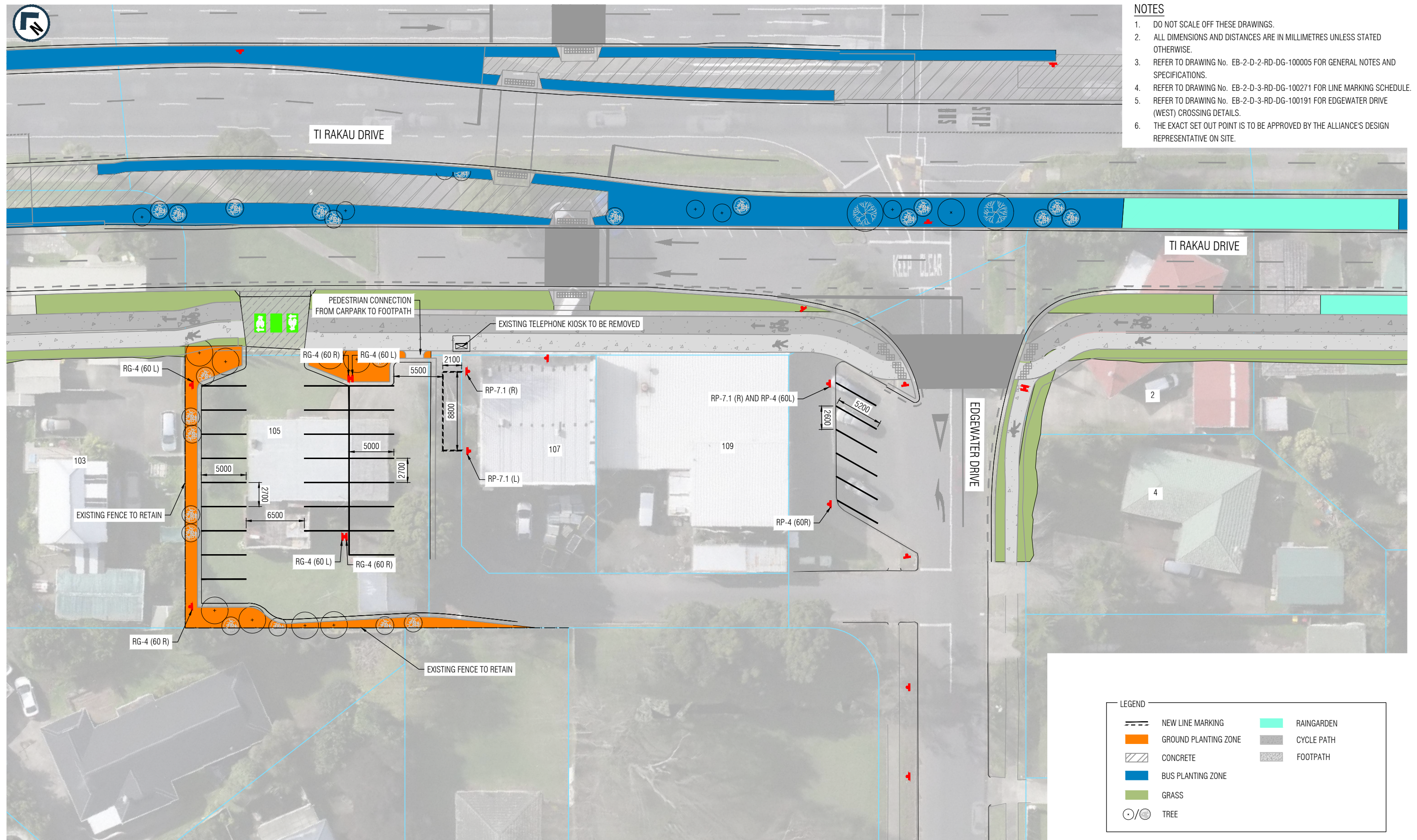
1614

Attachment 2 – Plan of Edgewater Shops Car Park



NOTES

- DO NOT SCALE OFF THESE DRAWINGS.
- ALL DIMENSIONS AND DISTANCES ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
- REFER TO DRAWING No. EB-2-D-2-RD-DG-100005 FOR GENERAL NOTES AND SPECIFICATIONS.
- REFER TO DRAWING No. EB-2-D-3-RD-DG-100271 FOR LINE MARKING SCHEDULE.
- REFER TO DRAWING No. EB-2-D-3-RD-DG-100191 FOR EDGEWATER DRIVE (WEST) CROSSING DETAILS.
- THE EXACT SET OUT POINT IS TO BE APPROVED BY THE ALLIANCE'S DESIGN REPRESENTATIVE ON SITE.



LEGEND

	NEW LINE MARKING		RAINGARDEN
	GROUND PLANTING ZONE		CYCLE PATH
	CONCRETE		FOOTPATH
	BUS PLANTING ZONE		
	GRASS		
	TREE		

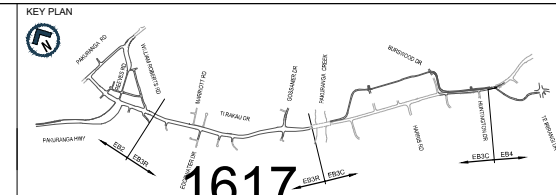
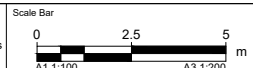
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ORIGINAL SIZE A1

**NOT TO BE ISSUED
DRAWING CURRENTLY IN PROGRESS**

This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the Alliance quality assurance system to ISO 9001. Printed copies of this document are UNCONTROLLED. Do not scale from this drawing

Designed	J. Atulwage	Checked	D. Angus
Drawn	K. Deng	Checked	M. Dalvi
Approved	S. Jones		
Date	XX/XX/2022	Approver Signature	



AUCKLAND MANUKAU EASTERN TRANSPORT INITIATIVE
EASTERN BUSWAY ALLIANCE
(PAKURANGA TO BOTANY)

PACKAGE No. 3AW-00

NOT FOR CONSTRUCTION

Drawing Status		STAGE 2		Design Package	
Horizontal Datum		NZGD 2000 MOUNT EDEN CIRCUIT		Drawing Title	
Vertical Datum		2016 NEW ZEALAND		EDGEWATER SHOPS CARPARK LAYOUT PLAN	
A1 SCALE	1:100	A3 SCALE	1:200	Drawing Number	EB-2-D-3-AW-DG-000010
					Revision
					A

ORIGINAL IN COLOUR

Attachment 3 - Updated Noise Tables

Address	Section	Existing	DoNothing	DoMin	Mitigation 4
2b Wheatley Avenue	EB3R	61	61	68	62
158 Ti Rakau Drive	EB3R	69	68	68	67
184 Ti Rakau Drive	EB3R	68	68	67	67
94 Ti Rakau Drive	EB3R	68	68	67	66
186 Ti Rakau Drive	EB3R	68	67	67	67
180 Ti Rakau Drive	EB3R	68	67	67	68
108 Ti Rakau Drive	EB3R	69	68	67	66
156 Ti Rakau Drive	EB3R	69	69	67	67
106 Ti Rakau Drive	EB3R	69	68	67	66
1-2/2 Chevis Place	EB3R	69	69	67	67
1-2/130 Ti Rakau Drive	EB3R	68	68	67	67
160 Ti Rakau Drive	EB3R	69	69	67	67
176 Ti Rakau Drive	EB3R	68	68	67	67
1-2/1 Chevis Place	EB3R	68	68	67	67
190 Ti Rakau Drive	EB3R	68	67	67	66
192 Ti Rakau Drive	EB3R	68	67	67	66
92 Ti Rakau Drive	EB3R	68	68	67	67
200 Ti Rakau Drive	EB3R	68	67	67	67
170 Ti Rakau Drive	EB3R	68	67	67	66
154 Ti Rakau Drive	EB3R	68	67	67	66
128 Ti Rakau Drive	EB3R	68	68	66	66
126-2/126 Ti Rakau Drive	EB3R	68	67	66	66
188 Ti Rakau Drive	EB3R	67	67	66	66
138 Ti Rakau Drive	EB3R	68	68	66	66
2a, 2b, 2c Marriott Road	EB3R	68	68	66	66
206 Ti Rakau Drive	EB3R	67	67	66	65
194 Ti Rakau Drive	EB3R	67	66	66	65
166 Ti Rakau Drive	EB3R	68	67	66	66
178 Ti Rakau Drive	EB3R	67	66	66	66
212 Ti Rakau Drive	EB3R	67	67	66	65
1-2/204 Ti Rakau Drive	EB3R	67	67	66	66
174 Ti Rakau Drive	EB3R	67	67	66	66
140 Ti Rakau Drive	EB3R	68	67	66	66
100 Ti Rakau Drive	EB3R	67	67	66	66
102 Ti Rakau Drive	EB3R	67	67	66	66
122 Ti Rakau Drive	EB3R	68	67	66	66
136 Ti Rakau Drive	EB3R	67	67	66	66
172 Ti Rakau Drive	EB3R	67	67	65	66
90 Ti Rakau Drive	EB3R	67	67	65	65
196 Ti Rakau Drive	EB3R	67	66	65	65
110 Ti Rakau Drive	EB3R	67	66	65	65
208 Ti Rakau Drive	EB3R	66	66	65	65
214 Ti Rakau Drive	EB3R	66	66	65	65
104 Ti Rakau Drive	EB3R	66	66	65	65
118 Ti Rakau Drive	EB3R	67	67	65	65
116 Ti Rakau Drive	EB3R	67	66	65	65

4 Edgewater Drive	EB3R	57	57	65	54
152 Ti Rakau Drive	EB3R	67	66	65	65
112 Ti Rakau Drive	EB3R	66	66	65	65
150 Ti Rakau Drive	EB3R	66	65	65	64
144 Ti Rakau Drive	EB3R	67	66	65	64
210 Ti Rakau Drive	EB3R	66	66	65	65
120 Ti Rakau Drive	EB3R	66	66	65	65
148 Ti Rakau Drive	EB3R	66	65	65	65
184b Ti Rakau Drive	EB3R	64	63	64	64
98 Ti Rakau Drive	EB3R	65	65	64	64
198 Ti Rakau Drive	EB3R	66	65	64	64
2/103 Ti Rakau Drive	EB3R	61	57	64	64
75a Ti Rakau Drive	EB3R	53	53	64	64
165b Edgewater Drive	EB3R	59	59	64	60
96 Ti Rakau Drive	EB3R	64	65	64	64
171 Gossamer Drive	EB3R	61	64	64	64
146 Ti Rakau Drive	EB3R	66	65	64	64
165a Edgewater Drive	EB3R	58	58	63	58
14 Edgewater Drive	EB3R	56	55	63	61
14 Edgewater Drive	EB3R	57	56	63	61
177 Ti Rakau Drive	EB3R	58	57	63	60
175 Gossamer Drive	EB3R	61	63	63	64
202 Ti Rakau Drive	EB3R	64	63	63	61
2/200 Ti Rakau Drive	EB3R	64	63	63	61
114 Ti Rakau Drive	EB3R	64	64	63	64
176 Gossamer Drive	EB3R	60	64	62	63
169 Gossamer Drive	EB3R	61	63	62	62
148 Edgewater Drive	EB3R	58	58	62	60
173 Gossamer Drive	EB3R	60	62	62	62
162a Ti Rakau Drive	EB3R	64	63	62	61
17 Fremantle Place	EB3R	54	54	62	62
23 Te Anau Place	EB3R	62	61	62	61
7 Fremantle Place	EB3R	53	53	62	62
19 Fremantle Place	EB3R	53	53	61	60
129 Ti Rakau Drive	EB3R	53	52	61	61
219 Ti Rakau Drive	EB3R	61	61	61	59
83a Ti Rakau Drive	EB3R	55	55	61	58
9 Fremantle Place	EB3R	53	53	61	61
19b Te Anau Place	EB3R	60	60	61	60
185 Ti Rakau Drive	EB3R	53	52	61	60
3 Fremantle Place	EB3R	56	56	61	61
83c Ti Rakau Drive	EB3R	52	52	61	61
83 Ti Rakau Drive	EB3R	53	53	61	60
183 Ti Rakau Drive	EB3R	54	54	61	60
172 Gossamer Drive	EB3R	59	62	60	61
9 Snell Place	EB3R	55	54	60	57
97 Ti Rakau Drive	EB3R	55	55	60	54

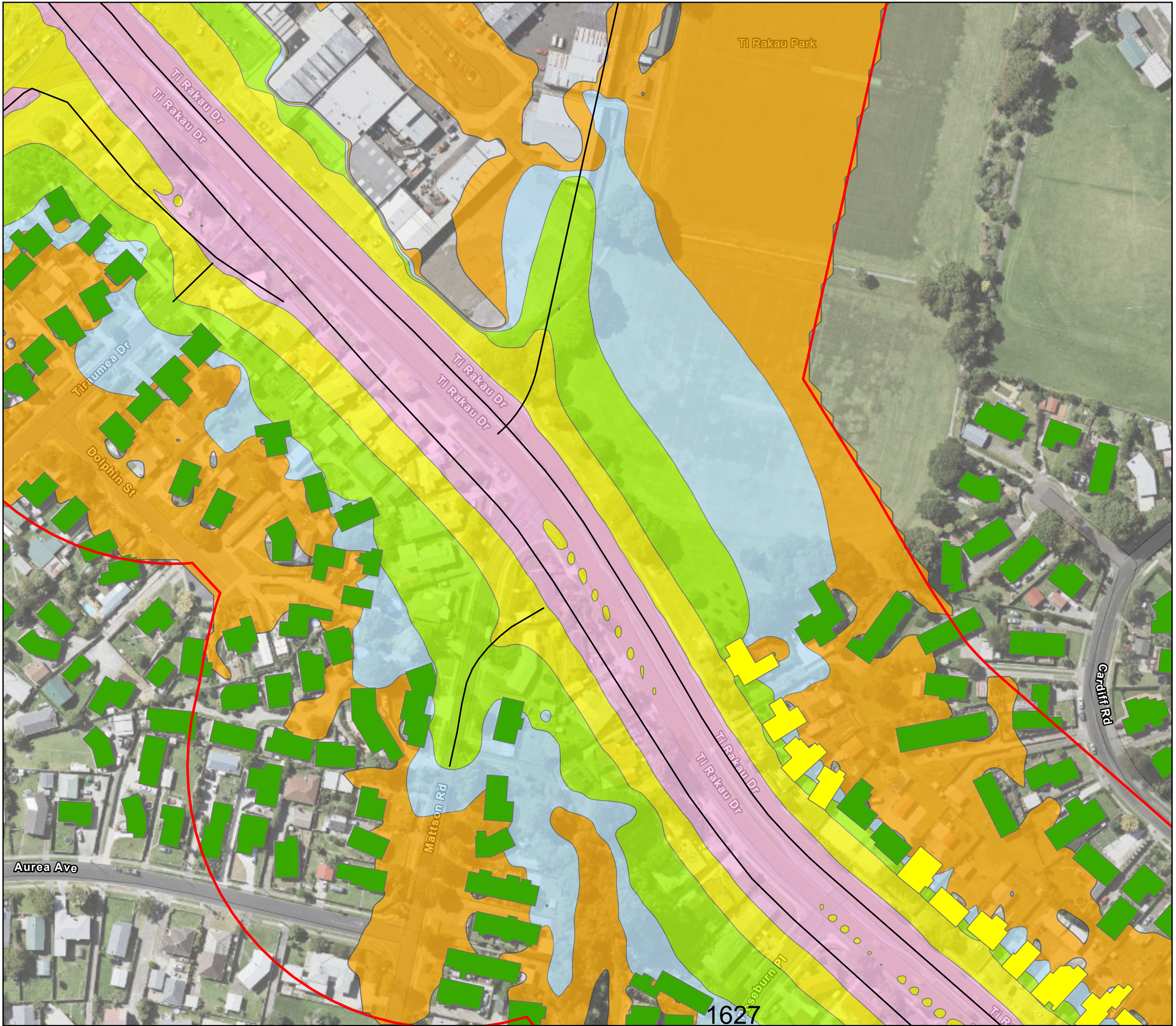
167 Gossamer Drive	EB3R	59	62	60	60
146 Edgewater Drive	EB3R	57	57	60	58
3 Wheatley Avenue	EB3R	53	53	60	59
40 Ellesmere Crescent	EB3R	59	59	60	60
175a-1/175a Ti Rakau Drive	EB3R	54	54	60	60
2 Paradise Place	EB3R	58	58	59	58
1/7 Wheatley Avenue	EB3R	53	52	59	59
3 Roseburn Place	EB3R	54	54	59	59
8 Mattson Road	EB3R	54	55	59	59
7 Wheatley Avenue	EB3R	54	53	59	53
15 Te Anau Place	EB3R	58	57	59	58
12 Ellesmere Crescent	EB3R	59	59	59	58
5 Snell Place	EB3R	52	52	59	59
10 Mattson Road	EB3R	52	53	59	59
4 Wheatley Avenue	EB3R	53	53	58	57
40 Riverhills Avenue	EB3R	59	61	58	59
114a Ti Rakau Drive	EB3R	59	58	58	52
42,42 Ellesmere Crescent	EB3R	57	56	58	56
19a Te Anau Place	EB3R	59	59	58	58
13 Te Anau Place	EB3R	57	56	58	57
177a Ti Rakau Drive	EB3R	55	54	58	54
10 Ellesmere Crescent	EB3R	57	58	58	57
1-3/12 Mattson Road	EB3R	52	51	58	58
142 Ti Rakau Drive	EB3R	58	58	58	58
6, 1/6 Edgewater Drive	EB3R	54	54	58	58
17a, 17b Te Anau Place	EB3R	57	56	58	58
91 Ti Rakau Drive	EB3R	52	51	58	58
162b Ti Rakau Drive	EB3R	59	58	57	57
18a Ellesmere Crescent	EB3R	57	56	57	54
1-2/4 Roseburn Place	EB3R	52	51	57	58
177b Ti Rakau Drive	EB3R	54	54	57	52
31 Fremantle Place	EB3R	54	53	57	53
1/144 Edgewater Drive	EB3R	51	50	57	56
8 Ellesmere Crescent	EB3R	56	56	57	55
3 Chevis Place	EB3R	57	57	57	56
8 Chevis Place	EB3R	57	56	57	55
7 Snell Place	EB3R	53	52	57	52
31 Miramar Place	EB3R	56	56	57	57
10 Chevis Place	EB3R	57	57	57	55
25 Miramar Place	EB3R	55	55	57	57
35 Miramar Place	EB3R	57	57	57	57
11 Snell Place	EB3R	53	53	57	54
6 Paradise Place	EB3R	55	56	57	57
1/164 Ti Rakau Drive	EB3R	57	56	57	55
14 Chevis Place	EB3R	57	56	57	55
19c Te Anau Place	EB3R	56	56	56	56
3 Snell Place	EB3R	50	49	56	56

166a Ti Rakau Drive	EB3R	57	57	56	57
30 Ellesmere Crescent	EB3R	53	53	56	53
34 Ellesmere Crescent	EB3R	55	55	56	54
6 Chevis Place	EB3R	57	56	56	57
1-2/8 Edgewater Drive	EB3R	52	53	56	56
36 Ellesmere Crescent	EB3R	55	55	56	55
27 Miramar Place	EB3R	54	54	56	57
28 Ellesmere Crescent	EB3R	55	55	56	56
24 Ellesmere Crescent	EB3R	55	54	56	54
26 Ellesmere Crescent	EB3R	55	55	55	56
14 Ellesmere Crescent	EB3R	55	55	55	52
16 Ellesmere Crescent	EB3R	54	54	55	51
14 Mattson Road	EB3R	51	50	55	56
1-2/6 Roseburn Place	EB3R	51	50	55	55
22 Ellesmere Crescent	EB3R	55	55	55	53
8 Wheatley Avenue	EB3R	52	51	55	52
13 Snell Place	EB3R	52	51	55	52
5 Chevis Place	EB3R	55	54	55	53
32 Ellesmere Crescent	EB3R	54	54	55	56
12 Chevis Place	EB3R	55	54	55	53
8 Paradise Place	EB3R	54	55	55	56
7 Roseburn Place	EB3R	52	51	55	55
145 Ti Rakau Drive	EB3R	50	50	55	53
18 Ellesmere Crescent	EB3R	54	54	55	55
38 Ellesmere Crescent	EB3R	54	53	55	55
38 Riverhills Avenue	EB3R	54	55	55	51
5 Roseburn Place	EB3R	52	52	55	55
2/18 Mattson Road	EB3R	50	50	54	55
3r Marriott Road	EB3R	54	54	54	55
5 Wheatley Avenue	EB3R	50	50	54	53
162c Ti Rakau Drive	EB3R	54	54	54	53
6 Wheatley Avenue	EB3R	51	51	54	54
163 Edgewater Drive	EB3R	50	49	54	54
83b Ti Rakau Drive	EB3R	51	51	54	53
33 Fremantle Place	EB3R	52	51	54	50
1-2/4 Marriott Road	EB3R	53	53	54	54
2/4 Ellesmere Crescent	EB3R	52	53	54	54
87 Ti Rakau Drive	EB3R	50	50	54	54
2/183 Ti Rakau Drive	EB3R	51	51	53	53
1 Paradise Place	EB3R	53	54	53	54
161 Edgewater Drive	EB3R	50	50	53	53
32 Te Anau Place	EB3R	55	54	53	54
44 Ellesmere Crescent	EB3R	52	51	53	51
4 Chevis Place	EB3R	56	55	53	54
142 Edgewater Drive	EB3R	52	52	53	54
11 Mattson Road	EB3R	50	51	53	53
10 Edgewater Drive	EB3R	50	50	53	53

1-2/9 Roseburn Place	EB3R	51	50	53	53
165 Edgewater Drive	EB3R	52	51	53	53
21 Fremantle Place	EB3R	50	50	53	54
1-3/57 Cardiff Road	EB3R	54	53	53	53
5 Fremantle Place	EB3R	52	53	53	54
88 Ti Rakau Drive	EB3R	53	53	53	53
9 Wheatley Avenue	EB3R	50	50	53	52
1/168 Ti Rakau Drive	EB3R	54	53	53	53
5 Aurea Avenue	EB3R	52	51	53	49
75 Cardiff Road	EB3R	53	52	53	50
1/10 Wheatley Avenue	EB3R	50	49	53	49
2 Snell Place	EB3R	49	49	53	52
140 Edgewater Drive	EB3R	51	51	52	52
2/10 Wheatley Avenue	EB3R	50	49	52	49
13 Mattson Road	EB3R	50	51	52	53
2/79 Cardiff Road	EB3R	53	52	52	52
2/144 Edgewater Drive	EB3R	48	48	52	52
4 Snell Place	EB3R	49	49	52	52
6 Ellesmere Crescent	EB3R	52	52	52	53
3r Marriott Road	EB3R	52	52	52	54
14 Edgewater Drive	EB3R	49	49	52	53
1 Aurea Avenue	EB3R	50	51	52	52
36 Riverhills Avenue	EB3R	51	52	52	52
3/168 Ti Rakau Drive	EB3R	52	51	52	53
2/168 Ti Rakau Drive	EB3R	52	52	52	52
162d Ti Rakau Drive	EB3R	52	51	52	52
30 Te Anau Place	EB3R	51	50	52	50
138 Edgewater Drive	EB3R	50	50	52	52
1-3/59 Cardiff Road	EB3R	52	52	52	52
1-2/10 Roseburn Place	EB3R	50	49	52	52
19 Te Anau Place	EB3R	52	52	52	48
15 Fremantle Place	EB3R	50	50	52	53
1-2/81 Cardiff Road	EB3R	52	51	52	52
1/67 Cardiff Road	EB3R	52	51	51	52
23 Fremantle Place	EB3R	50	50	51	51
89 Ti Rakau Drive	EB3R	49	49	51	51
8 Roseburn Place	EB3R	50	49	51	52
12 Snell Place	EB3R	50	50	51	48
136 Edgewater Drive	EB3R	49	49	51	52
14 Snell Place	EB3R	50	49	51	49
7 Chevis Place	EB3R	51	51	51	51
65 Cardiff Road	EB3R	52	51	51	51
20 Ellesmere Crescent	EB3R	50	50	51	52
1-3/51 Cardiff Road	EB3R	51	51	51	52
21 Te Anau Place	EB3R	50	50	51	49
1-2/63 Cardiff Road	EB3R	51	51	51	51
12 Fremantle Place	EB3R	50	50	51	51

7 Marriott Road	EB3R	53	52	51	51
5a Roseburn Place	EB3R	48	47	51	52
11 Fremantle Place	EB3R	49	49	51	51
10 Paradise Place	EB3R	50	50	50	50
29 Fremantle Place	EB3R	50	49	50	51
A-C/16 Mattson Road	EB3R	49	49	50	53
14 Edgewater Drive	EB3R	49	48	50	50
134 Edgewater Drive	EB3R	48	48	50	51
1-2/53 Cardiff Road	EB3R	51	50	50	51
77 Cardiff Road	EB3R	51	50	50	51
61 Cardiff Road	EB3R	51	50	50	50
2/164 Ti Rakau Drive	EB3R	50	49	50	50
55 Cardiff Road	EB3R	50	50	50	50
69a,69b Cardiff Road	EB3R	50	50	50	50
1-2/73 Cardiff Road	EB3R	50	49	50	50
28 Te Anau Place	EB3R	49	48	50	50
17 Te Anau Place	EB3R	49	48	50	48
1/18 Mattson Road	EB3R	48	49	50	51
2 Ellesmere Crescent	EB3R	49	49	50	50
10 Snell Place	EB3R	48	48	49	49
11 Wheatley Avenue	EB3R	48	47	49	49
13 Fremantle Place	EB3R	49	48	49	49
71 Cardiff Road	EB3R	50	49	49	50
26a Te Anau Place	EB3R	48	47	49	48
25 Fremantle Place	EB3R	48	48	49	50
7 Aurea Avenue	EB3R	49	48	49	49
1/4 Ellesmere Crescent	EB3R	48	48	49	49
13 Wheatley Avenue	EB3R	47	47	49	48
3 Aurea Avenue	EB3R	49	48	49	49
67 Cardiff Road	EB3R	49	49	49	49
3/10 Wheatley Avenue	EB3R	48	47	49	49
27 Fremantle Place	EB3R	48	48	48	49
14 Edgewater Drive	EB3R	47	46	48	49
35 Fremantle Place	EB3R	48	47	48	49
1/79 Cardiff Road	EB3R	49	48	48	49
5a Aurea Avenue	EB3R	48	47	48	48
11 Roseburn Place	EB3R	48	47	48	51
5 Edgewater Drive	EB3R	47	46	47	47
19a Miramar Place	EB3R	48	47	47	48

Attachment 4 – Noise Map



Legend

- Road Centrelines
- ▭ Assessment Area

Mitigation 4

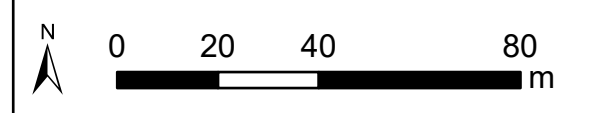
- ▭ 64 dB < LAeq(24h)
- ▭ 64 dB ≤ LAeq(24h) < 67 dB

Noise Level, dB LAeq

- ▭ 50 dB ≤ LAeq(24h) < 55 dB
- ▭ 55 dB ≤ LAeq(24h) < 60 dB
- ▭ 60 dB ≤ LAeq(24h) < 65 dB
- ▭ 65 dB ≤ LAeq(24h) < 70 dB
- ▭ LAeq(24h) ≥ 70 dB

EB2/EB3R Noise Contour Map
Road Traffic Noise
Mitigation 4 Scenario

Page 12 of 19



Map Creation Date: 19/10/2022
 Author: Shivam Jakhu

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E7 Eastern Busway Alliance

Fletcher | Hacciona | AECOM | Jacobs



Legend

- Road Centrelines
- ▭ Assessment Area

Mitigation 4

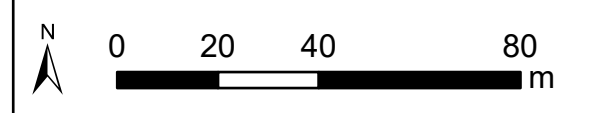
- ▭ 64 dB < LAeq(24h)
- ▭ 64 dB ≤ LAeq(24h) < 67 dB

Noise Level, dB LAeq

- ▭ 50 dB ≤ LAeq(24h) < 55 dB
- ▭ 55 dB ≤ LAeq(24h) < 60 dB
- ▭ 60 dB ≤ LAeq(24h) < 65 dB
- ▭ 65 dB ≤ LAeq(24h) < 70 dB
- ▭ LAeq(24h) ≥ 70 dB

EB2/EB3R Noise Contour Map
Road Traffic Noise
Mitigation 4 Scenario

Page 13 of 19



Map Creation Date: 19/10/2022
 Author: Shivam Jakhu

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Legend

- Road Centrelines
- Noise Barrier
- ▭ Assessment Area

Mitigation 4

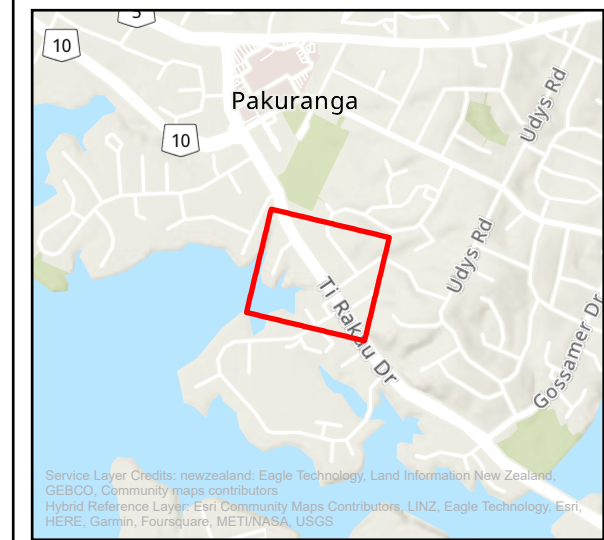
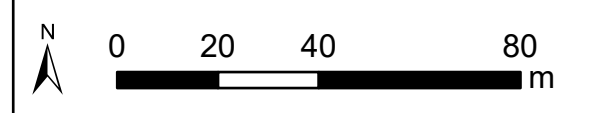
- ▭ 64 dB < LAeq(24h)
- ▭ 64 dB ≤ LAeq(24h) < 67 dB

Noise Level, dB L_{Aeq}

- ▭ 50 dB ≤ LAeq(24h) < 55 dB
- ▭ 55 dB ≤ LAeq(24h) < 60 dB
- ▭ 60 dB ≤ LAeq(24h) < 65 dB
- ▭ 65 dB ≤ LAeq(24h) < 70 dB
- ▭ LAeq(24h) ≥ 70 dB

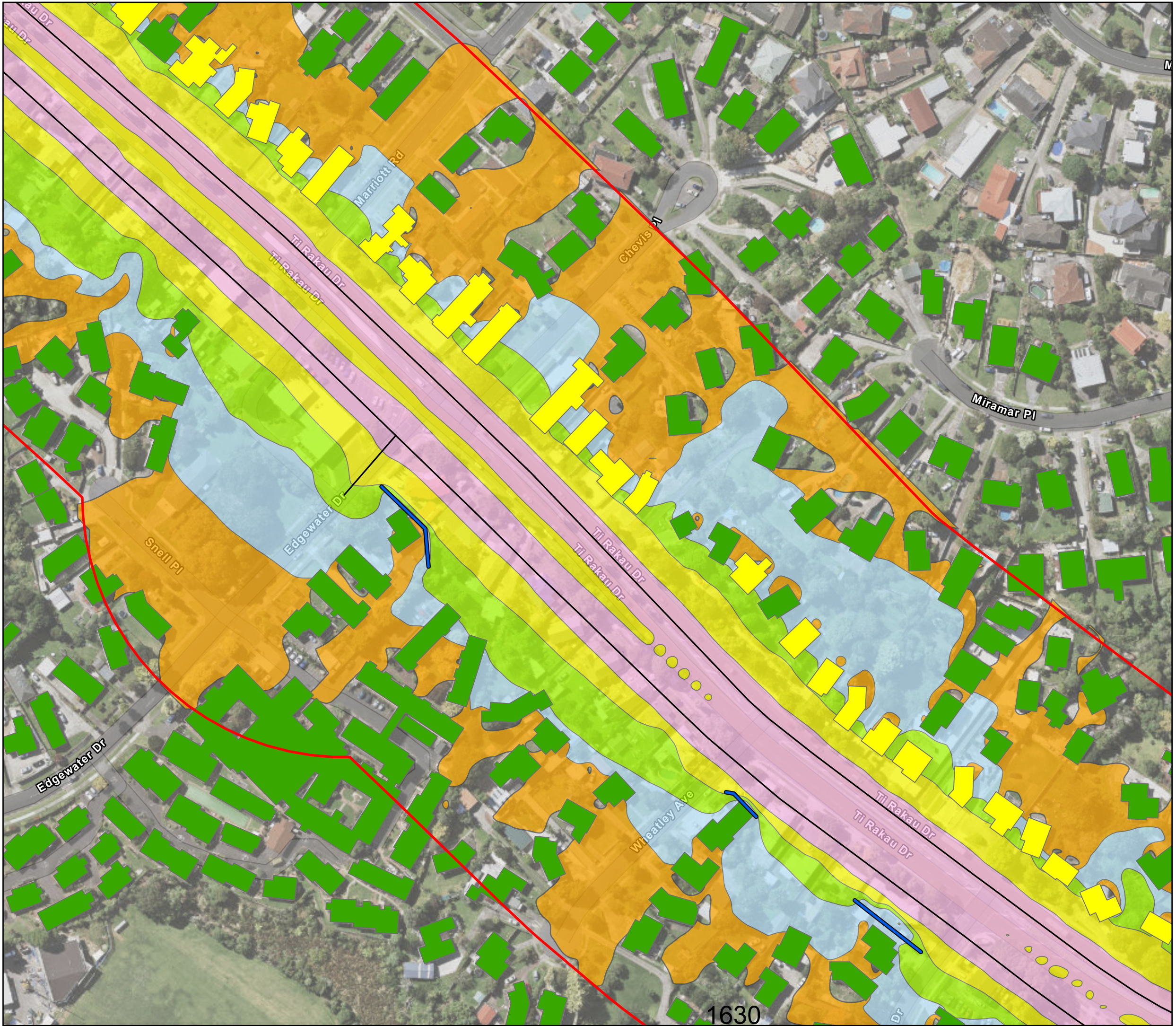
EB2/EB3R Noise Contour Map
Road Traffic Noise
Mitigation 4 Scenario

Page 14 of 19



Map Creation Date: 19/10/2022
 Author: Shivam Jakhu

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Legend

- Road Centrelines
- Noise Barrier
- Noise Barrier
- Noise Barrier
- ▭ Assessment Area

Mitigation 4

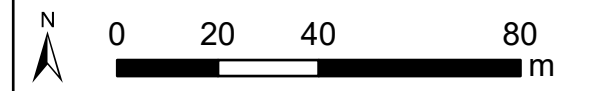
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Noise Level, dB LAeq

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EB2/EB3R Noise Contour Map
Road Traffic Noise
Mitigation 4 Scenario

Page 15 of 19



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Legend

- Road Centrelines
- Noise Barrier
- Noise Barrier
- Noise Barrier
- ▭ Assessment Area

Mitigation 4

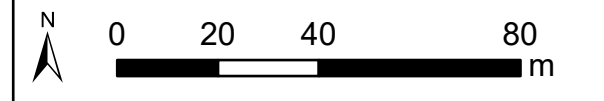
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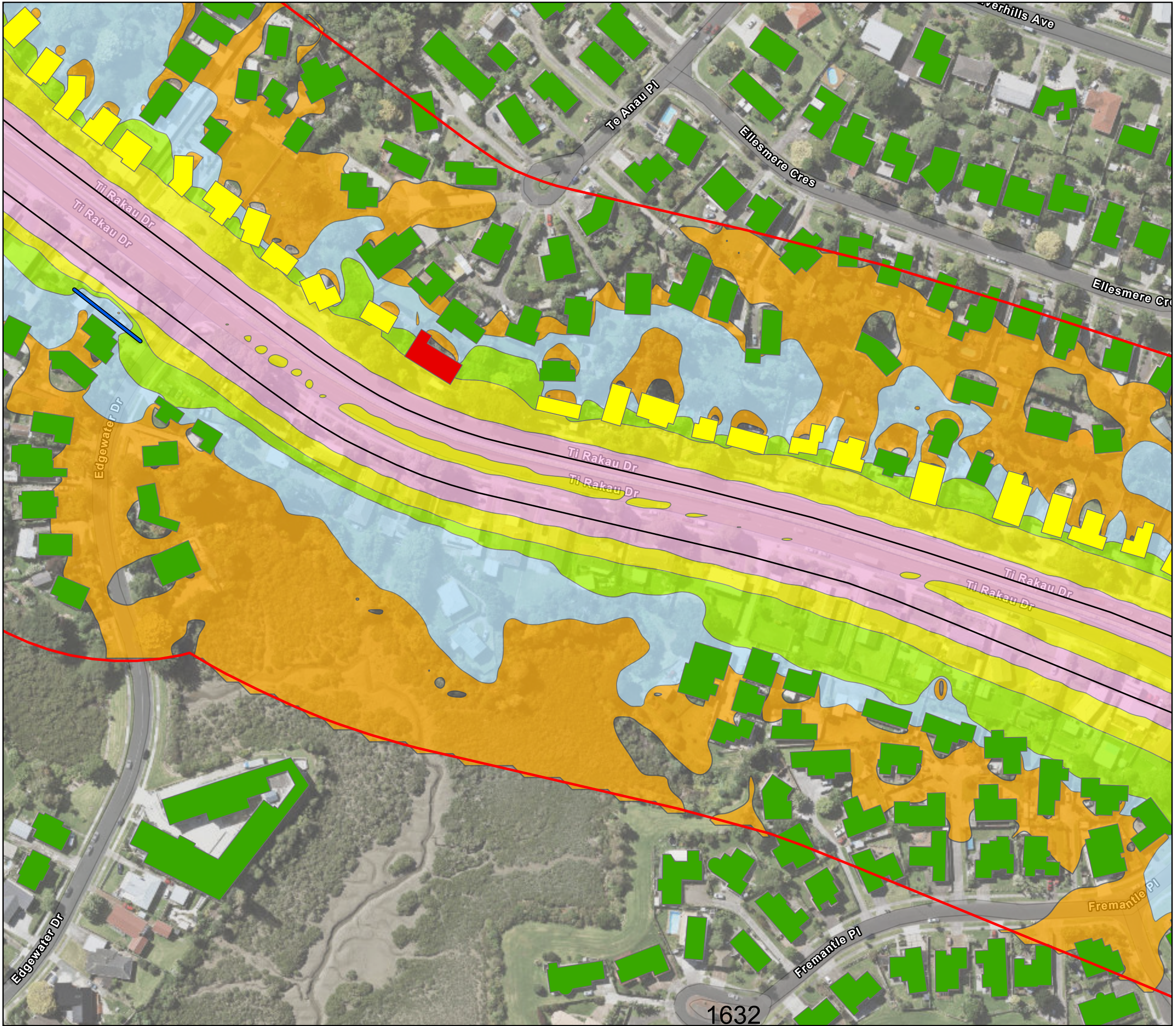
EB2/EB3R Noise Contour Map
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Legend

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- Noise Barrier
- ▭ Assessment Area

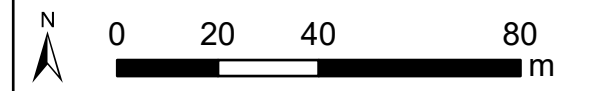
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**EB2/EB3R Noise Contour Map
Road Traffic Noise
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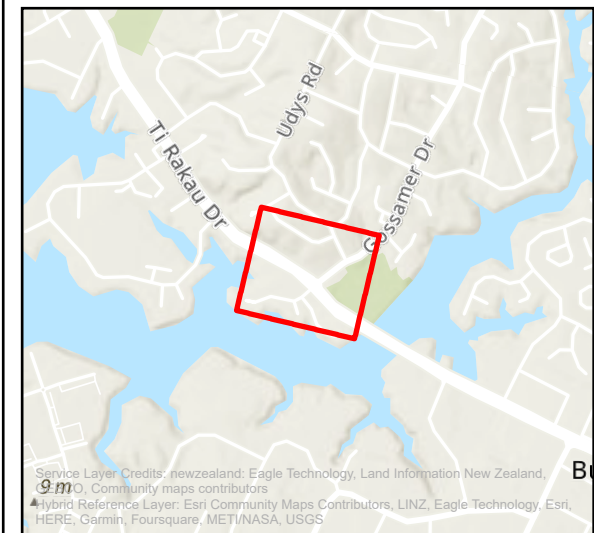
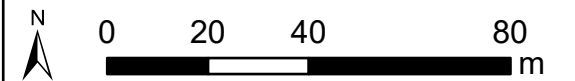


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Road Traffic Noise
Mitigation 4 Scenario**

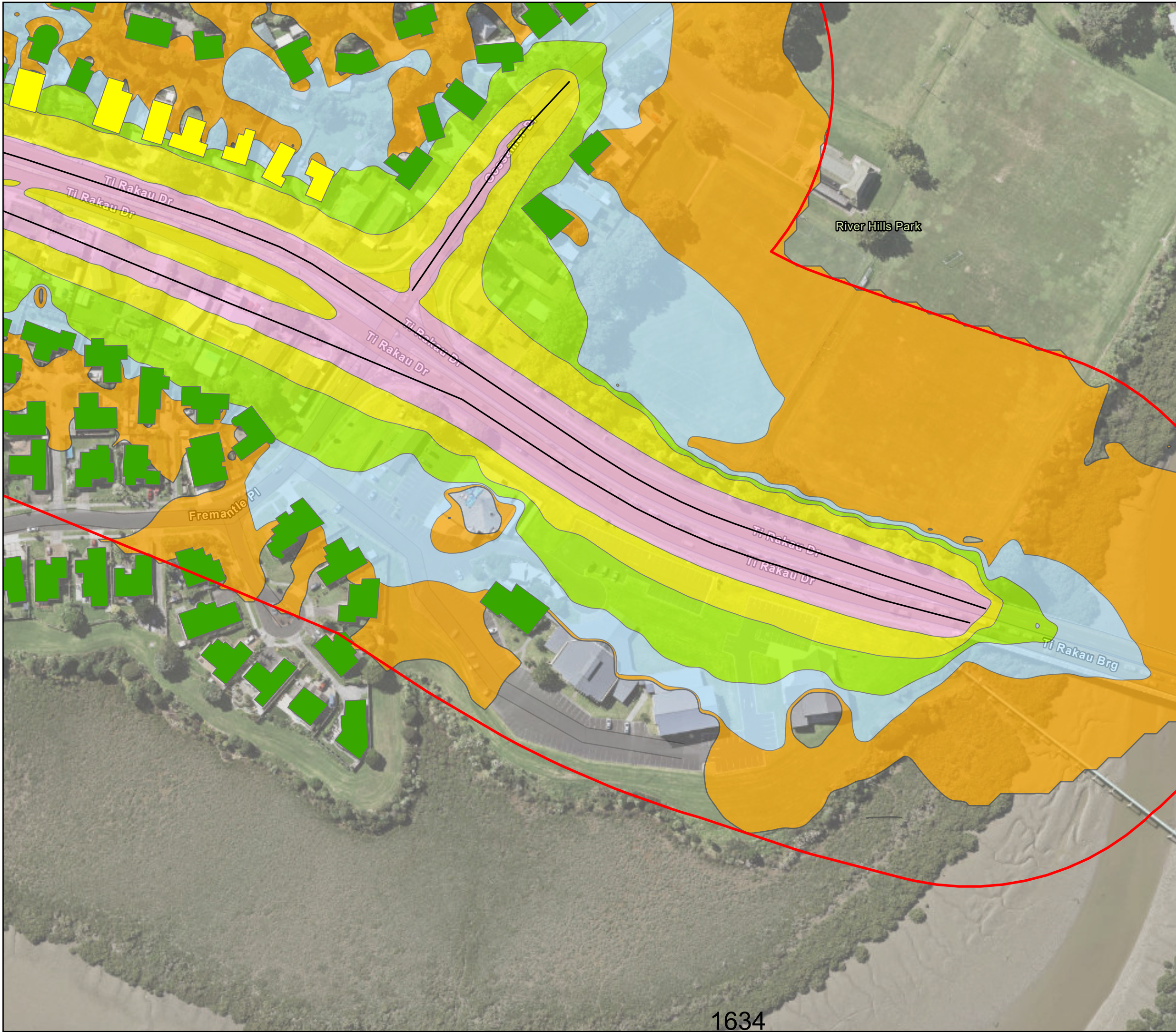
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Legend

- Road Centrelines
- ▭ Assessment Area

Mitigation 4

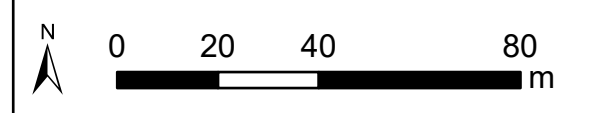
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EB2/EB3R Noise Contour Map
Road Traffic Noise
Mitigation 4 Scenario

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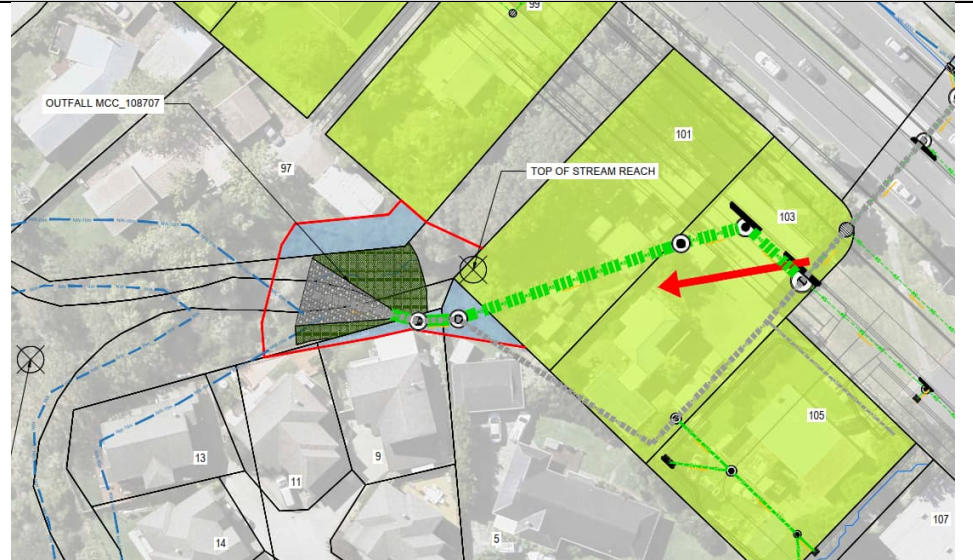
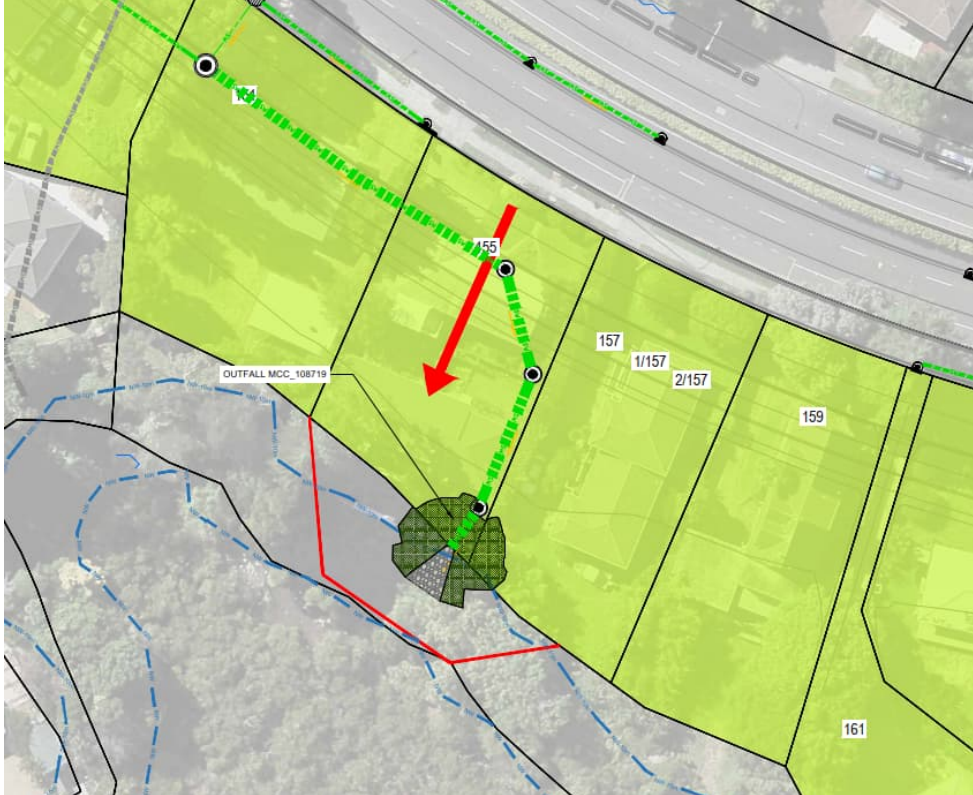
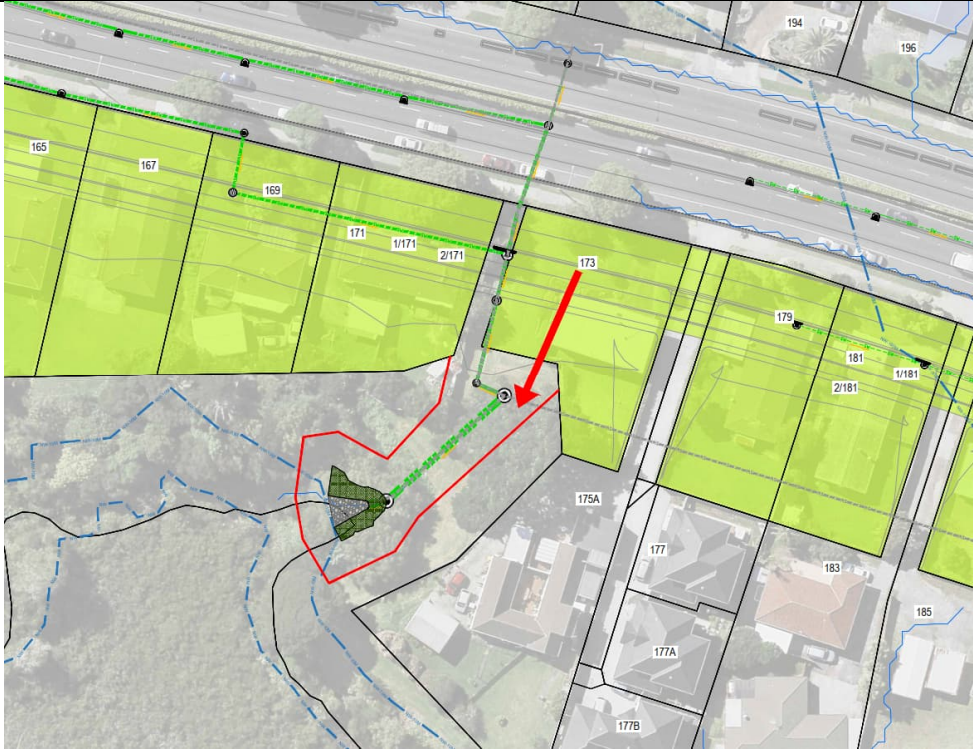


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Attachment 5 - Stormwater Outfall Table

Summary of Structural Elements for Eastern Busway Stormwater Outfalls

Outfall Name	Current Outfall Dimensions	Drawing Exert	AUP – Chapter E3 Controls (E3.6.1.10 and E3.6.1.12)				AUP - E26.3.3.1	NES - Freshwater							
			Is stream disturbance less than 10m (excluding structure)?	ESCP to be employed?	Fish passage not obstructed	Erosion/scour management works do not exceed 5m in length, either side of the extended structure.		Fish Passage Provided up and downstream	Culvert laid parallel to the slope of the bed of the river	Mean cross-sectional water velocity in the culvert no greater than that in all immediately adjoining river reaches	Culvert's width where it intersects with the bed of the river or connected area (s) and the width of the bed at that location (w), both measured in metres, must compare as follows: (i) where $w \leq 3$, $s \geq 1.3 \times w$; (ii) where $w > 3$, $s \geq (1.2 \times w) + 0.6$	Culvert is open-bottomed or has its invert must be placed so that at least 25% of the culvert's diameter is below the level of the bed;	Bed substrate must be present over the full length of the culvert and stable at the flow rate at or below which the water flows for 80% of the time	culvert provides for continuity of geomorphic processes	Area of vegetation within 10m a wetland for specified infrastructure (includes mangroves) Area of Earthworks or land disturbance outside a 10 m, but within a 100 m of a wetland (includes mangroves) Area of Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural wetland is a discretionary activity if it— is likely to result, in the complete or partial drainage of all or part of the natural wetland.
MCC_108707	Existing 750 mm Upgraded Outfall is 1600 mm		Stream disturbance less than 10m (armouring downstream of existing pipe outfall is 6 m)? Resource consent not required.	Yes Resource consent not required.	Fish passage is not obstructed (there is no upstream waterway channels) Resource consent not required.	Erosion/scour management works do not exceed 5m in length, either side of the extended structure (armouring extends 6 m downstream of existing outfall). Resource consent required.	Approx. 940 m ² of vegetation clearance and related earthworks required for work. Resource consent required.	Fish passage is not provided up and downstream (there is no upstream waterway channels) Resource consent not required.	This is not a culvert, it's a network drainage pipe. Resource consent not required.	There are no immediately adjoining river reaches Resource consent not required.	This is not a culvert it's a network drainage pipe. $S = 1.35m$ $W = 4.6 m$ Resource consent not required.	Closed bottom network drainage pipe. Pipe invert is at bed level. Resource consent not required.	Closed bottom network drainage pipe. There is no bed substrate in the pipe Resource consent not required.	Not a culvert, it's a network drainage pipe which does not provides for continuity of geomorphic processes Resource consent not required.	Approx. 940 m ² of vegetation clearance and related earthworks required for work. Resource consent required.
MCC_108719	Existing 150 mm New 1050 mm		There is no stream, network drainage pipe discharges to CMA (no disturbance to the CMA) Resource consent not required.	Yes Resource consent not required	Fish passage is not obstructed (there is a gully upstream connected to a 300 mm network drainage pipe system) Resource consent not required	This is not a stream. Erosion/scour management works do not exceed 5m in length, downstream of existing pipe end (the pipe outfall has been pulled back upstream so the armouring matches the existing end of pipe) Resource consent not required	Approx. 400 m ² of vegetation clearance and related earthworks required for works. Resource consent required.	Fish passage is not provided up and downstream (there is a gully that enters a piped network via a 300 mm pipe) Resource consent not required	This is not a culvert, it's a network drainage pipe. Resource consent not required	There are no immediately adjoining river reaches Resource consent not required	This is not a culvert it's a network drainage pipe discharging to CMA. Resource consent not required.	Closed bottom network drainage pipe. Pipe invert is at bed level. Resource consent not required	Closed bottom network drainage pipe. There is no bed substrate in the pipe Resource consent not required	Not a culvert, it's a network drainage pipe which does not provides for continuity of geomorphic processes Resource consent not required	Approx. 400 m ² of vegetation clearance and related earthworks required for works. Also, 58.5m ² of earthworks and vegetation clearance within the coastal wetland Resource consent required.
MCC_108738	Existing 450 mm New 1050 mm		There is no stream, network drainage pipe discharges to CMA (no disturbance to the CMA) Resource consent not required.	Yes Resource consent not required.	Fish passage is not obstructed (there is no upstream waterway channel) Resource consent not required.	This is not a stream. Erosion/scour management works do not exceed 5m in length, downstream of existing pipe end (the pipe outfall has been pulled back upstream so only 6.4 m of armouring extends beyond the existing pipe end) Resource consent not required.	Approx. 430 m ² of vegetation clearance and related earthworks required for works. Resource consent required	Fish passage is not provided up and downstream (there is no upstream waterway channel) Resource consent not required.	This is not a culvert, it's a network drainage pipe. Resource consent not required.	There are no immediately adjoining river reaches Resource consent not required.	This is not a culvert it's a network drainage pipe discharging to CMA. Resource consent not required.	Closed bottom network drainage pipe. Pipe invert is at bed level. Resource consent not required.	Closed bottom network drainage pipe. There is no bed substrate in the pipe Resource consent not required.	Not a culvert, it's a network drainage pipe which does not provides for continuity of geomorphic processes Resource consent not required.	Approx. 430 m ² of vegetation clearance and related earthworks required for works.

Summary of Structural Elements for Eastern Busway Stormwater Outfalls

Outfall Name	Drawing Exert	AUP – Chapter E3 Controls (E3.6.1.10 and E3.6.1.14)					AUP - E26.3.3.1	NES - Freshwater							
		Total length of instream structure is less than 30m	ESCP to be employed?	Is stream disturbance less than 10m (excluding structure)?	Fish passage not obstructed	1 per cent annual exceedance probability (AEP) flood provided for.		Area of vegetation clearance proposed within 10m of stream (riparian margins)	Area of vegetation within 10m of coastal margin (coastal area)	Fish Passage Provided up and downstream	Culvert laid parallel to the slope of the bed of the river	Mean cross-sectional water velocity in the culvert no greater than that in all immediately adjoining river reaches	Culvert's width where it intersects with the bed of the river or connected area (s) and the width of the bed at that location (w), both measured in metres, must compare as follows: (i) where $w \leq 3$, $s \geq 1.3 \times w$; (ii) where $w > 3$, $s \geq (1.2 \times w) + 0.6$	Culvert is open-bottomed or has its invert must be placed so that at least 25% of the culvert's diameter is below the level of the bed;	Bed substrate must be present over the full length of the culvert and stable at the flow rate at or below which the water flows for 80% of the time
Outfall 02 (1800 mm) adjacent to MCC_108699 (900 mm)		Total length of instream structure is less than 30m (there is 19 m of armouring of stream channel from existing outfall). Resource consent not required.	Yes Resource consent not required	stream disturbance is more than 10m (disturbance is 19 m from existing outfall). Resource consent required	Fish passage is not obstructed (there is no upstream waterway channels therefore no fish passage provided) Resource consent not required.	Yes, pipe size is based on flood modelling to achieve no impacts on private property Resource consent not required.	Approx. 750 m ² of vegetation clearance and related earthworks required for works. Resource consent required	No – Network Drainage not a Culvert, there is no upstream waterway channels and no fish passage provided Resource consent not required.	No, this is not culvert, this is a network drainage pipe discharging to a stream (no observed base flow on 29-9-22) Resource consent not required.	There are no immediately joining river tributaries only discharges from network drainage pipes. Velocities are reduced by energy dissipation measures at outfalls Resource consent not required.	No upstream open channel, network drainage pipe discharges to stream (no base flow observed on 29-9-22). W = 3.0 m S = 1.8 m Resource consent not required.	Closed bottom network drainage pipe discharging to Stream. 1800 mm pipe invert level is 900 mm above bed level Resource consent not required.	Not a culvert, it's a network drainage pipe and there is no Bed substrate present Resource consent not required.	Not a culvert and does not provide for continuity of geomorphic processes Resource consent not required.	Approx. 750 m ² of vegetation clearance and related earthworks required for works. Resource consent required
Outfall 300 (1600 mm) adjacent to MCC_108703 (600 mm)		Total length of instream structure is less than 30m (there is 24 m of armouring of stream channel from existing outfall). Resource consent not required.	Yes Resource consent not required	stream disturbance is more than 10m (24 m from existing pipe to extent of works for new outfall) Resource consent required	Fish passage is not obstructed (there is no upstream waterway channels therefore no fish passage provided) Resource consent not required.	Yes, pipe size is based on flood modelling to achieve no impacts on private property Resource consent not required.	Approx. 460 m ² of vegetation clearance and related earthworks required for works. Resource consent required	No – Network Drainage not a Culvert, there is no upstream waterway channels and no fish passage provided Resource consent not required	No, this is not culvert, this is a network drainage pipe discharging to a stream (no observed base flow on 29-9-22) Resource consent not required	There are no immediately joining river tributaries only discharges from network drainage pipes. Velocities are reduced by energy dissipation measures at outfalls Resource consent not required	No upstream open channel, network drainage pipe discharges to channel W = 1.8 m S = 1.35 m Resource consent not required	Closed bottom network drainage pipe discharging to Stream. 1350 mm pipe invert level is at bed level Resource consent not required	Not a culvert, it's a network drainage pipe and there is no Bed substrate present Resource consent not required	Not a culvert and does not provide for continuity of geomorphic processes Resource consent not required	Approx. 460m ² of vegetation clearance and related earthworks required for works. Resource consent required
Outfall 305 (Riverhills Overland Flow Channel)		No Structure in a Stream Resource consent not required	Yes Resource consent not required	No stream disturbance Resource consent not required	Fish passage is not obstructed (there is no upstream waterway channels therefore no fish passage provided) Resource consent not required	Yes, network drainage pipe size and overland flow path channel is based on flood modelling to achieve no impacts on private property Resource consent not required	Approx. 250m ² of vegetation clearance and related earthworks required for works. Resource consent required	No, this is an overland flow path channel discharging to Pakuranga Creek (no upstream waterway channels, with on network drainage pipes upstream) and therefore no fish passage provided Resource consent not required	No this is an overland flow path channel discharging to Pakuranga Creek (no upstream waterway channels, with on network drainage pipes upstream) Resource consent not required	Pakuranga Creek is a large waterway within the CMA. Velocities are reduced by energy dissipation prior to discharging into the overland flow channel and into Pakuranga Creek Resource consent not required	Not a culvert and not relevant for an overland flow channel entering a creek. Resource consent not required	A network discharge pipe discharges to an overland flow path. Not relevant. Resource consent not required	A network discharge pipe discharges to an overland flow path. Not relevant. Resource consent not required	A network discharge pipe discharges to an overland flow path. Not relevant. Resource consent not required	Approx. 250m ² of vegetation clearance and related earthworks required for works. Approx. 90m ² of vegetation clearance and related earthworks within a coastal wetland required for works. Resource consent required

Attachment 6 – Streamworks Ecological Assessment

Eastern Busway – EB3 Residential Stream Memorandum

Stormwater Effects Assessment: Streams

Document Number: EB-ME-3-PL-000001[A]

Eastern Busway – Sections EB2 and EB3 Residential

Document History and Status			
Rev	Date	Author	Position
A	17.10.2022	Morgan Witton	Senior Ecologist

Document Approval					
Rev	Action	Name	Position	Date	Signature
A	Reviewed by	Fiona Davies	Associate Director – Environment	29/10/22	On file
B	Reviewed by	Roger McDonald	Principal Planner	31/10/22	On file
C	Reviewed by	Sonja Lister	Planning Lead	31/10/22	On file
1	Approved by	Karyn Sinclair	RMA Planning and Property Manager	01/10/22	On file

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List of Abbreviations and Definitions

Abbreviation and Definitions	Description
AEE	Assessment of Effects on the Environment
AUP(OP)	Auckland Unitary Plan (Operative in Part) 2016
BPO	Best Practicable Option
EB3 Residential/ EB3R	Eastern Busway 3 (SEART to Gossamer Drive)
EBA	Eastern Busway Alliance
km	Kilometre(s)
m	Metre(s)
m ²	Square Metre(s)
NES - FW	Resource Management (National Environmental Standards for Freshwater) Regulations 2020
NPS - FM	National Policy Statement for Freshwater Management 2020
NZCPS	New Zealand Coastal Policy Statement 2010
AUP(OP)	Auckland Unitary Plan (Operative in part) 2016
RMA	Resource Management Act 1991

1 Introduction

The Eastern Busway Project (the Project) is a package of works focusing on promoting an integrated, multi-modal transport system to support population and economic growth in South-East Auckland. The Project requires the upgrade and construction of several stormwater outfalls (including pipes and outlets) to support additional runoff from impervious layers created through Eastern Busway 2 (EB2) and Eastern Busway 3 Residential (EB3R) works.

Three streams were identified above the Coastal Marine Area (CMA) of EB3R and required additional assessment to ensure the Project's effects are appropriately managed. The purpose of this report is to provide an ecological effects assessment for the stormwater upgrades on the EB3R streams, as well as to inform mitigation requirements and statutory consenting requirements under the National Environmental Standards for Freshwater (NES-F) and National Policy Statement for Freshwater (NPS-FW). This assessment also addresses the consenting requirements of the Auckland Unitary Plan (Operative in Part) (AUP(OP)).

This report should be read in conjunction to the previously submitted stormwater, terrestrial and freshwater ecology, and marine ecology assessments.

1.1 Assessment Content

This report describes the assessment of stormwater effects on streams and associated vegetation affected by the operation and construction of EB3R's stormwater outfalls.

1.2 Reasons for Consent and Statutory Considerations

The following matters for consent have been identified as triggers for resource consent:

AUP(OP) Rules under Section 9(2) of the Resource Management Act 1991 (RMA)

Rule E26.3.3.1 (A77) - Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4.

Comment: Outfalls MCC108699, MCC108703 and MCC108707 require the removal of 2,150 m² of vegetation within the riparian and coastal areas. As such, they do not comply with Standard E26.3.5.2 and require resource consent as a restricted discretionary activity.

AUP(OP) Rules under Section 13 of the RMA

Rule E3.4.1 (A44) – Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.14 to E3.6.1.23.

Comment: Outfalls MCC108699, MCC108703 and MCC108707 each feature more than 5m of scour management work. As such, they do not comply with standards associated with Standard E3.6.1.14(1b) and require resource consent as a discretionary activity.

Rule E3.4.1 (A44) - Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.14 to E3.6.1.23

Comment: Outfalls MCC108699 and MCC108703 each involve more than 10 m of stream disturbance. As such, they do not comply with Standard E3.6.1.14(2) and require resource consent as a discretionary activity.

It is noted that these additional matters for consent do not alter the bundled activity status of EB3R, which was lodged as a non-complying activity.

The NES-F standards relating to culverts do not apply in this assessment as the stormwater outfall upgrades are not considered to meet the definition of 'Culvert'. The definition of culvert "is a pipe, box structure, arched or covered channel that has an inlet and outlet, which connects the water or bed of the river or connected area." None of the outfalls present any inlet or upstream habitat and the outfall upgrades should be considered as part of the stormwater network and discharge.

Owing to the presence of mangrove forest (deemed a natural wetland under the NES-F) within the CMA, all other outfalls that fall within 10m of the CMA are subject to NES-F regulations and trigger the following consents¹.

Regulation 45(1) - Vegetation clearance within, or within a 10 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure.

Comment: Outfalls MCC108699, MCC108703 and MCC108707 require the removal of 2,150 m² of vegetation within 10 m of a natural wetland. As such, they require resource consent as a discretionary activity.

Regulation 45(2) - Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure.

Comment: Outfalls MCC108699, MCC108703 and MCC108707 require 2,150 m² of earthworks within 10 m of a natural wetland. As such, they require resource consent as a discretionary activity.

The reader is directed to the submitted EB3R assessment of effects on the environment (AEE) in relation to other consent triggers, permitted baseline considerations, relevant statutory documents and s104(1) matters.

¹ It should be noted that the EB3R's effects on coastal wetlands have been previously assessed by the lodged AEE and Marine Ecology Assessment.

2 Methodology and Analysis

2.1 Ecological Impact Assessment Approach

The approach followed in this assessment is consistent with the approach outlined in the Ecological Impact Assessment Guidelines (EIANZ, 2018).

The initial step (step one) is to assess the value of ecological features within the ZOI of the Project with respect to Representativeness, Rarity, Diversity and Pattern, and Ecological context. Appendix 1 outlines the specific methodology applied to inform the ecological value assessment for stream and riparian features.

The second step requires a systematic assessment of magnitude of ecological effects related to specific Project features and activities. The magnitude of effect is then combined with the outcome of the value assessment (step one) and magnitude assessment (step two) to determine an inherent level of effect prior to impact management (prior to consideration of controls and existing avoidance measures).

The third step relates to identifying reasonable and practical mitigation, generally where the level of effect is determined to be Moderate or higher. Mitigation should be developed that is consistent with the mitigation hierarchy, the management of uncertainty and should also consider cumulative effects.

The fourth step relates to the management of any residual effects where mitigation of ecological values cannot be achieved and effects remain significant. This may entail offset or compensation measures.

2.2 Freshwater Ecology – Site Investigations

2.2.1 Stream Classification

A site walkover was undertaken on 15th and 22nd of September 2022. Three streams were identified within the EB3R project area and were classified as permanent, intermittent or ephemeral according to the stream definitions described by Story and Wadhwa (2009) (summarised in Table 2-1).

Table 2-1 Stream classification criteria (Storey and Wadhwa 2009)

Criteria	Definition
Permanent stream	
1	Evidence of continuous flow
Intermittent or ephemeral stream	
1	Evidence of natural pools
2	Well defined banks and bed
3	Retains surface water present more than 48 hours after a rain event
4	Rooted terrestrial vegetation not established across channel
5	Organic debris from flooding present on floodplain
6	Evidence of substrate sorting, including scour and deposition

Criteria	Definition
	* If three or more of the six assessment criteria can be met with confidence, the watercourse is considered intermittent. If at least three criteria cannot be met, the watercourse is considered ephemeral.

2.2.2 The stream ecological valuation (SEV)

The stream ecological valuation (SEV) methodology (Storey et al., 2011) was undertaken on three stream reaches directly affected by EB3R works on 15th and 22nd of September 2022.

The ecological functions informing the SEV are represented by four broad stream function categories (hydraulic, biochemical, habitat provision and biodiversity provisions). Inputs from each function are used to calculate an overall SEV score by means of averages and algorithms. The resulting score ranges between 0 (Poor) and 1 (Excellent) and is used to indicate the ecological function of the stream or watercourse (refer to Table 2-2). Instream macroinvertebrate and fish communities were sampled at each SEV location, in accordance with the methodologies described in the Sections below. The results of the macroinvertebrate and fish surveys were fed into the SEV calculations, and this provided the biological data required for the assessment.

Measurements of physical stream attribute's including stream width (wetted and active), depth, velocity, in-stream habitat and riparian characteristics were also assessed.

Table 2-2 Interpretation of SEV scores (Storey et al. 2011)

Score	Ecological Value
0 – 0.4	Poor
0.41 – 0.60	Moderate
0.61 – 0.80	Good
0.81 +	Excellent

2.2.3 Macroinvertebrate Sampling Methodology

Instream macroinvertebrate communities were sampled at each SEV location following protocols developed for the sampling of macroinvertebrates in wadeable, soft-bottomed streams in New Zealand (Stark et al., 2001). Using protocol C2 (soft-bottomed, semi-quantitative) (Stark et al., 2001) a substrate area of approximately 3 m² was manually disturbed at various locations at each site. Dislodged organisms and materials were then swept up using a D-net (0.5 mm mesh). Sampled substrate types varied according to availability at each site, but included submerged wood and macrophytes, banks margins and overhanging vegetation.

Composite samples were preserved on site in ethanol and shipped to a qualified macroinvertebrate taxonomist where they were processed following protocol P3 (full count with subsampling option) (Stark et al., 2001).

The analyses of macroinvertebrate species data was used to calculate the Macroinvertebrate Community index (MCI).

2.2.4 eDNA Collection Methodology – Fish survey

The fish assessment was undertaken with Environmental DNA (eDNA) sampling. For each stream one eDNA mini kit was used. This method addresses the limitations of conventional sampling (i.e., diurnal

and seasonal differences in fish activity, electrocution bias, under representation of species occurring at low abundances and improved taxonomic confidence). A 100-mL filtered water sample was taken using Wilderlab eDNA sample kits and sent to the laboratory (Wilderlab) for analysis. Laboratory analysis included eDNA sequence counts using multi-species DNA metabarcoding targeting fish, macroinvertebrates, mammals and birds.

2.3 ECR calculation methodology

The Ecological Compensation Ratio (ECR) utilises the SEV stream score to calculate a ratio for the minimum stream area (stream bank width x stream length) to be restored (offset) as mitigation for stream loss (Storey *et al.*, 2011). The aim of the ECR is to ensure no net loss of ecological functioning (loss of function at impact site, gain of function at offset site).

The formula for calculation the ECR is set out below:

$$ECR = [(SEVi-P - SEVi-I)/(SEVm-P - SEVm-C)] \times 1.5$$

- SEVi-C & SEVi-P are the current and potential SEV values respectively for the site to be impacted;
- SEVm-C & SEVm-P are the current and potential SEV values respectively for the site where environmental offset is to be applied;
- SEVi-I is the predicted SEV value of the stream to be impacted, after impact.

Once the ECR is calculated then the ratio (stream loss: stream offset) can be used to calculate the required area (or length) of stream offset. For stream area calculations, the stream active channel width has been utilised.

3 Existing Freshwater Environment

3.1 General Site Overview

Three streams (Stream 2, Stream 3a and Stream 3b) were identified in the EB2 and EB3R Terrestrial and Freshwater Ecological Effects Assessment along Ti Rakau Drive, Pakuranga (Figure 3-1). The streams consist of remanent tributaries with a historical rural catchment that drained into the Tāmaki River (Figure 3-2). Today, the streams are highly modified and are situated within an urbanised catchment. They discharge into the Tāmaki River via the Pakuranga Creek and are entirely fed by stormwater.

The majority of new or modified Project outfalls occur within coastal marine area (CMA). The outfalls that have been considered as part of this report relate to those located within streams (defined as freshwater habitat above the CMA) in EB3R (Table 3-1).

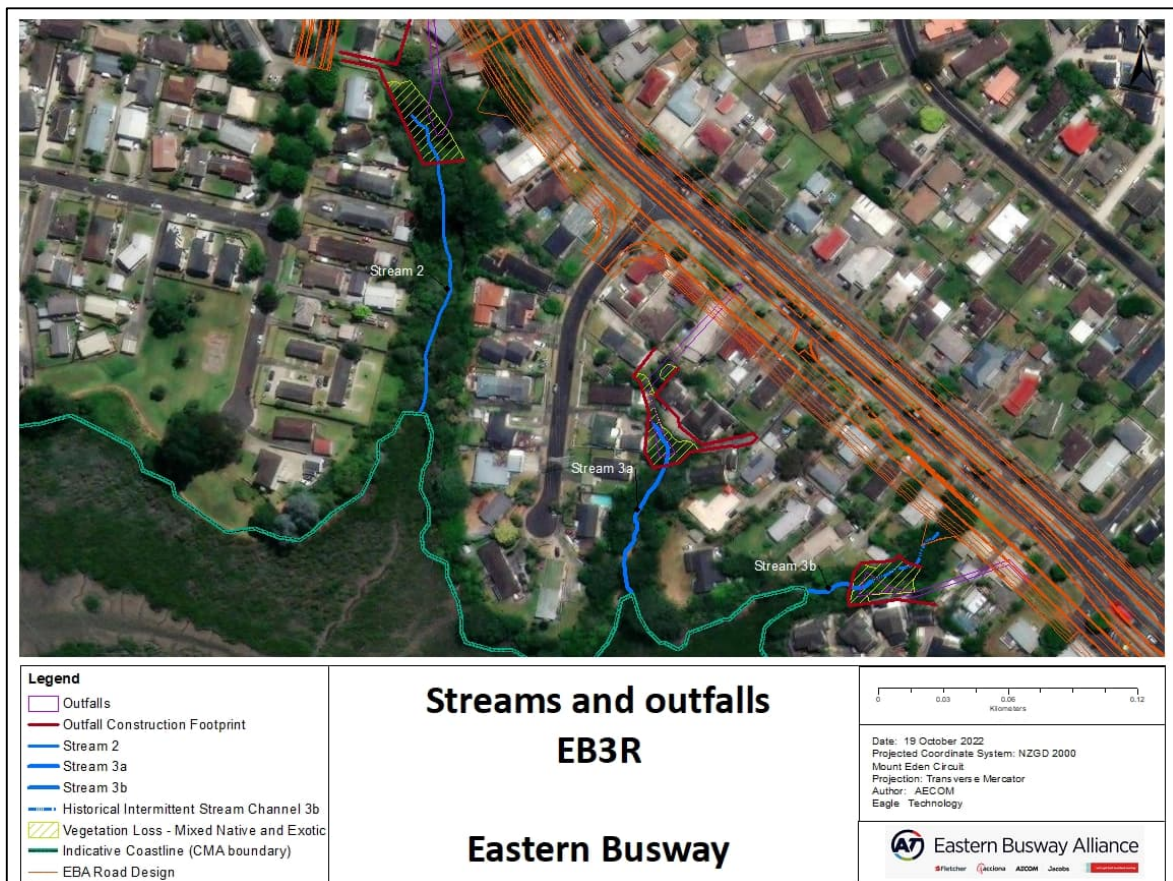


Figure 3-1 Streams and outfalls EB3R

The outfall upgrades associated with each of the streams are provided below in Table 3-1.

Table 3-1 Stream name and outfall name

Stream name	Outfall name
Stream 2	MCC108699
Stream 3a	MCC108703
Stream 3b	MCC108707

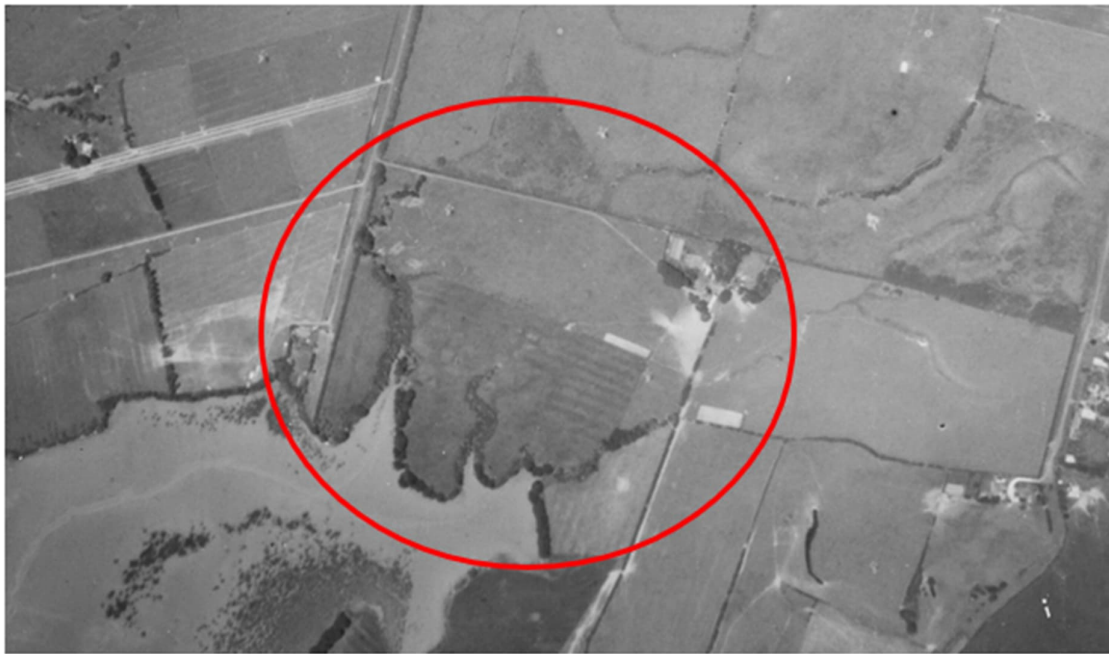


Figure 3-2 Retrolens imagery 1940 (date taken 14.04.40; Survey number SN139). The red circle shows the location of Stream 2, 3a and 3b

3.2 Ecological Context

3.2.1 Stream 2

Stream 2 forms a small tributary to the west of Stream 3a and stream 3b. The catchment is entirely supported by an existing stormwater outfall. Surrounding riparian vegetation is a mix of native and exotic scrubland. There is overgrowth of exotic species including, *Monstera sp.* (Swiss cheese plant), *Zantedeschia aethiopica* (Arum Lily), *Tradescantia fluminensis* (wandering willie), *Hedera helix* (ivy) and *Solanum mauritianum* (Woolly nightshade). The stream is soft sediment, and has defined channels with a series of run and pool habitat. There is evidence of high sediment loading with visually turbid water and several areas of debris and rubbish disposed in the stream channel. Shortfin eel (*Anguilla australis*) were visible at the outfall discharge. The stream meets the definition of permanent under the AUP(OP) definitions (refer Table 2-1). The physical stream attributes are presented in Table 3-2 with stream photos presented in Figure 3-3 and Appendix 2.

3.2.2 Stream 3a

Stream 3a is situated in the middle of Stream 2 and Stream 3b. Surrounding riparian vegetation is a mix of native and exotic treeland/scrubland. Several exotic species including *Monstera sp.* (Swiss cheese plant), *Tradescantia fluminensis* (wandering willie), *Hedychium sp.* (wild ginger), *Jasminum sp.* (Jasmin), *Cortaderia sp.* (pampus), *Bambusa sp.* (bamboo) dominate the understory. The stream is soft sediment, has defined channels with dominantly run habitat. There is evidence of high sediment loading with visually turbid water and several areas of debris and rubbish disposed in the stream channel. Shortfin eel (*Anguilla australis*) were present around the riparian margins of the stream channel. The stream meets the definition of permanent under the AUP(OP) definitions (refer Table 2-1). The physical stream attributes are presented in Table 3-2 with stream photos presented in Figure 3-3 and Appendix 2.

3.2.3 Stream 3b

The eastern Stream 3b is highly modified, with high sediment loading. Surrounding riparian vegetation is a mix of native and exotic treeland/scrubland. Several exotic species including *Monstera sp.* (Swiss cheese plant), *Tradescantia fluminensis* (wandering willie), *Hedychium sp.* (wild ginger), *Jasminum sp.* (Jasmin), *Cortaderia sp.* (pampus), *Zantedeschia aethiopica* (Arum Lily), *Quercus sp.* (Oak tree), *Solanum mauritianum* (Woolly nightshade), *Lonicera japonica* (Japanese honeysuckle), *Allium triquetrum* (Three-cornered garlic) dominate the understory.

Stormwater has diverted water to intercept mid-channel leading to a remnant overland flow path downstream of the road alignment, transitioning to an intermittent flow path immediately above the existing outfall. Downstream of the existing stormwater outfall, the stream is permanent and its flow is maintained by the stormwater network. Owing to the historical presence of a stream channel, the feature meets the AU(OP) definition of intermittent stream above the outfall and permanent stream below the outfall (refer Table 2-1). The physical stream attributes are presented in Table 3-2 with stream photos presented in Figure 3-3 and Appendix 2.

Table 3-2 Physical stream attributes for Stream 2, Stream 3a and Stream 3b.

Physical stream attributes	Stream 2	Stream 3a	Stream 3b
Wetted width (m)	2.5	1	2
Active channel width (m)*	3	3	3
Velocity (m ² S ⁻¹)	0.033	0.007	0.006
Depth (m)	0.7	0.6	0.7

*Used in ECR calculations of stream area

A) Stream 2 – Permanent



B) Stream 3a – Permanent



C) Stream 3b – intermittent flow above the existing outfall



D) Stream 3b – permanent stream below the stormwater outfall



Figure 3-3 Streams within EB3R A) stream 2, B) Stream 3a, C) and D) stream 3b

3.3 Stream Ecological Valuations

The SEV scores for the three stream reaches are summarised in Table 3-3. The full assessment is provided in Appendix 4. The hydraulic, biogeochemical, biodiversity and habitat provisioning functions of the streams assessed have been modified by existing land use and catchment development.

Both Stream 2 and Stream 3b scores reflect Moderate value and Stream 3a is reflective of Poor stream value under the SEV scoring criteria (Storey et al. 2011)

Table 3-3 Summary of mean scores for each component of the SEV assessment, including the overall SEV score for the stream reaches surveyed.

Stream function	Stream 2	Stream 3a	Stream 3b
Hydraulic	0.36	0.29	0.37
Biogeochemical	0.60	0.60	0.60
Habitat provision	0.44	0.32	0.48
Biodiversity	0.15	0.19	0.31
SEV Score	0.412	0.382	0.454
SEV value	Moderate	Poor	Moderate

3.3.1 Fish species

Fish species recorded within the three streams are all Not-threatened native and exotic species of Low ecological value (Table 3-4). However, although not detected in this survey, *Inanga* (*Galaxias maculatus*) may be present during certain periods of the year (spawning and migration).

Table 3-4 Fish species present within Stream 2, Stream 3a and Stream 3b

Common name	Latin name	Threat Status (Dunn et al. 2017)	Stream recorded	Value
Banded kōkopu	<i>Galaxias fasciatus</i>	Not threatened	Stream 3b	Low
Shortfin eel	<i>Anguilla australis</i>	Not threatened	Stream 2 Stream 3a Stream 3b	Low
Mosquitofish	<i>Gambusia affinis</i>	Exotic	Stream 2 Stream 3a	Very Low
Goldfish	<i>Carassius auratus</i>	Exotic	Stream 2 Stream 3b	Very Low

3.4 Ecological value

The ecological value assessment takes into consideration several ecological attributes relating to representativeness (including the SEV assessment), rarity and distinctiveness, diversity and pattern and ecological content. The ecological value assessment is provided below in Table 3-5. The full ecological value assessment is provided in Appendix 3. The overall current ecological value for all streams has been assessed as Low. The overall potential ecological value for all streams has been assessed at Moderate (Table 3-6).

Table 3-5 Current ecological value assessment streams within EB3R

Attributes considered	Stream 2	Stream 3a	Stream 3b
Representativeness (inclusive of current SEV score)	2	2	2
Rarity/distinctiveness	1	1	1
Diversity and pattern	2	2	2
Ecological context (Ecosystem services, importance and sensitivity)	3	3	3
Ecological value	Low	Low	Low

Table 3-6 Potential ecological value assessment for streams within EB3R

Attributes considered	Stream 2	Stream 3a	Stream 3b
Representativeness (inclusive of potential SEV score)	3	3	3
Rarity/distinctiveness	1	1	1
Diversity and pattern	2	2	2
Ecological context (Ecosystem services, importance and sensitivity)	3	3	3
Ecological value	Moderate	Moderate	Moderate

4 Assessment of Stormwater Effects

4.1 Construction

Three stormwater outfalls will be upgraded within three streams in EB3R. The proposed construction activities have the potential to impact streams without mitigation. Where effects are assessed to be Moderate or higher, then mitigation has been outlined and is detailed in Section 5.

Under Chapter E3 of the AUP(OP) matters for discretion clause 1a), the effect on both the existing (current) and potential values needs to be considered. As such, the potential value of Moderate will be used in the effects assessment.

Table 4-1 Construction effects - Streams

Effect No.	Ecological Feature	Ecological value	Effects Description	Magnitude of Effect	Justification of Magnitude	Level of effect Without Mitigation
Streams						
1a. Direct	Stream 2 Stream 3a Stream 3b	Moderate	Permanent loss/modification of stream habitat due to the upgrade of existing outfalls. Stream 2 (12.1m of stream loss/modification) Stream 3a (10.9m of stream loss/modification) Stream 3b (2m of stream loss/modification)	High	The stream habitat is highly disturbed and presently has no upstream habitat suitable for fish. Their catchments remain entirely piped for stormwater. However, the stormwater outfall upgrades will result in the permanent loss/modification of a portion of remaining downstream system. Policy 6 of the NPS-FW details that the loss of river extent and value is avoided. As such, the magnitude of effect is high.	Moderate

Effect No.	Ecological Feature	Ecological value	Effects Description	Magnitude of Effect	Justification of Magnitude	Level of effect Without Mitigation
2a. Direct	Native fish	Low	Kill or injure fish due to construction of outfall structures	Very High	The killing of native fish is considered an unacceptable effect.	Moderate
3a Indirect	Stream 2 Stream 3a Stream 3b	Moderate	Uncontrolled discharge leading to habitat and water quality degradation due to earthworks (leading to sediment discharge), machinery use and chemical storage (leading to leaks/spills)	Low	<p>An Erosion and Sediment Control Plan and an Environmental Management Plan are already included as part of the condition set. This effects assessment assumes the successful implementation of these management plans in relation sediment and/or chemical discharges. Effective implementation of best practice management will reduce the frequency, duration and probability of this effect type occurring.</p> <p>Temporarily elevated sediment discharge may still occur during construction. However, streams are situated within high sediment laden zones with partial tidal influence. Temporarily elevated sediment discharge is unlikely to affect the current ecological value of the streams.</p>	Very Low

Vegetation Clearance						
4a Direct	TL.2 Mixed native and exotic treeland/shrubland	Moderate	<p>Temporary loss of habitat/ecosystem, including filtering of stream inputs.</p> <p>Construction will result in the temporary loss of riparian vegetation (up to 2,150m²)</p>	Low	<p>The temporary loss of riparian vegetation is temporary and reversible and unlikely to permanently deviate from baseline conditions.</p> <p>In addition, existing (embedded) controls are considered in this magnitude assessment and include minimising disruption and unnecessary removal of vegetation and the replanting of suitable native planting mixes for the Auckland Region. Planting specifications should be detailed in the Urban Design and Landscape Plan. Effects on native fauna (birds and lizards) are detailed within the EB2 and EB3R Ecological Assessment.</p>	Low

4.2 Operation

The Project stormwater report details the operational effects of stormwater discharge. Overall, the stormwater quality for EB3R is predicted to improve. At one location an increase in contaminant load (zinc, copper and TPH) is predicted at outfall MCC_018707 (Stream 3b), due to a 100% increase in road catchment area, with 300m of east and westbound carriageway being diverted to its network. Operational effects from stormwater on stream ecology (habitat and fauna) have not been considered for this report because stormwater discharge is considered compliant as per the existing Network Discharge Consent held by Auckland Council Healthy Waters.

5 Impact Management

This section outlines the impact management requirements for the actual and potential effects from the stormwater outfalls outlined above. In accordance with the EIANZ guidelines (2018) measures to avoid, remedy or mitigate effects is focused on ecological features where the level of effect was assessed to be Moderate, High or Very high.

5.1 Effect No. 1a Stream Loss/Modification

5.1.1 Stream 2

To accommodate the new outfall, the design of the existing outfall will extend approximately 12.1m at Stream 2, leading to a stream area impact of 36.2m². The length of impact is calculated from where the existing outfall ends to the length of new outfall apron. This will lead to a reduction in SEV scores, from 0.51 potential to 0.29 predicted impacted score.

In terms of positive effects from the project works, it was assumed that the removal of instream debris, closed native canopy cover can be achieved at this site, this is assumed to enhance physical and hydrological attributes at the site. Moreover, the improvements to the stormwater design and water treatments proposed will improve water quality, leading to a higher potential score than the current score. The full SEV scores are provided in Appendix 4.

5.1.2 Stream 3a

To accommodate the new outfall, the design of the existing outfall will extend approximately 10.9m at Stream 3a, leading to a stream area impact of 32.6m². The length of impact is calculated from where the existing outfall ends to the length of new outfall apron. This will lead to a reduction in SEV scores, from 0.48 potential to 0.28 predicted impacted score.

In terms of positive effects from the project works, it was assumed that the removal of instream debris and closed native canopy cover could be achieved at this site, this is assumed to enhance physical and hydrological attributes at the site. Moreover, the improvements to the stormwater design and water treatments proposed will improve water quality, leading to a higher potential score than the current score. The full SEV scores are provided in Appendix 4.

5.1.3 Stream 3b

To accommodate the new outfall, the design of the existing outfall will extend approximately 2m at Stream 3b, leading to a stream area impact of 6m². The length of impact is calculated from where the existing outfall ends to the length of new outfall apron. There is minimal loss here as the outfall is situated vertically over the existing outfall, however the culvert apron extends 2m beyond the existing outfall.

In terms of positive effects from the project works, it was assumed that the removal of instream debris and closed native canopy cover could be achieved at this site. The full SEV scores are provided in Appendix 4.

5.1.4 Ecological Compensation Ratio Calculation

The ECR calculation considers the loss in ecological value as a result of the impact from upgrading the outfalls (74.85 m² area in total). The calculated compensation required to offset the loss/modification of stream habitat from the outfall construction is 83m/249m² in total (Table 5-1).

Table 5-1 ECR calculation table for Stream 2, Stream 3a and Stream 3b

ECR Calculation		Stream 2	Stream 3a	Stream 3b
ECR		Function Score	Function Score	Function Score
	SEVi-P	0.51	0.48	0.47
	SEVi-I	0.29	0.28	0.28
Loss	SEVi-P - SEVi-I	0.22	0.20	0.19
	SEVm-P	0.51	0.48	0.47
	SEVm-C	0.41	0.38	0.38
Gain	SEVm-P - SEVm-C	0.10	0.09	0.08
Ratio	$[(SEVi-P - SEVi-I)/(SEVm-P - SEVm-C)]$	2.32	2.10	2.21
Factor		1.50	1.50	1.50
ECR	$[(SEVi-P - SEVi-I)/(SEVm-P - SEVm-C) \times 1.5]$	3.48	3.15	3.32
Streambed area				
		Length (m)	Width (m)	Area (m2)
	Stream 2 Impact (Outfall)	12.08	3	36.24
	Stream 3a Impact (Outfall)	10.87	3	32.61
	Stream 3b Impact (Outfall)	2	3	6
Mitigation				
		Stream 2	Stream 3a	Stream 3b
	Mitigation area required (m ²)	126	103	20
	Mitigation length required (m)	42	34	7
Total mitigation length required (m)				83
Stream length available for mitigation (m)		116	61	18
				195

5.1.5 Stream Mitigation Requirements

On-site mitigation is proposed for the impacted streams. On-site mitigation is preferred (Storey et al., 2011; Maseyk et al., 2018) and the SEV scores have been applied in such a way to facilitate this goal. The on-site mitigation is proposed to be beneficial for the three streams impacted and considered appropriate in this instance. The total length of the stream reaches available within the three streams is approximately 195m/585m². Therefore, the entire stream offset (83m) can be accommodated as onsite mitigation within the three stream reaches. Mitigation will include the removal of exotic weeds, removal of rubbish/debris, pest control and replanting native vegetation to achieve 90% canopy cover.

Stream Restoration Plan

The Stream Restoration Plan shall detail the restoration required to achieve the above mitigation, including not be limited to the following:

- 1) Description of mitigation to be implemented at each stream location, including scope, methodology and timing;
- 2) Removal of exotic species within the riparian zone;
- 3) Replanting of 10 m of native plantings on each bank to ensure canopy cover to >90% in 10 years. All native species shall be Eco-sourced;
- 4) Landscape plan of plant species proposed including location and spacing;
- 5) Removal of rubbish and debris in stream channel; and

- 6) Maintenance and monitoring methods, including measurable outcomes for success. It is assumed that the maintenance and monitoring will be undertaken over a period of 5 years.

The updated set of proposed conditions for EB3R include a requirement for the preparation of a Stream Restoration Plan. The proposed condition sets out the purpose of the plan and the information that it is to include.

5.2 Effect No. 2a Fish Mortality

Instream works during construction i.e., culvert expansion, may impact on native fish within stream reaches. This activity may result in fish injury or death. To mitigate this potential effect a Native Fish Capture and Relocation Plan shall be prepared as detailed below.

Native Fish Capture and Relocation Plan

The Native Fish Capture and Relocation Plan shall detail but not be limited to the following:

- 1) Details on timing of plan implementation, taking into account native fish migration and potential inanga spawning (Nov to May);
- 2) Methodologies to capture native fish;
- 3) Details of the qualified ecologist to undertake the capture and relocation and to be present on-site during dewatering to rescue and relocate any remaining fish present;
- 4) Details of the relocation site(s); and
- 5) Storage and transport measures.

The updated set of proposed conditions for EB3R include a requirement for the preparation of a Native Fish Capture and Relocation Plan. The proposed condition sets out the purpose of the plan and the information that it is to include.

6 Recommendations and Conclusions

The key impact management principles recommended in order to avoid/minimise/mitigate the effects on freshwater ecological values associated with EB3R streams have included:

- Minimising disruption and unnecessary removal of vegetation.
- Replanting around stormwater outfalls where temporary vegetation clearance has occurred. Planting specifications should be detailed in the Project Urban Design and Landscape Plan.
- Follow best-practice site construction management practices for sediment, dust and erosion control (Erosion and Sediment Control Plan and Environmental Management Plans are already included as part of the condition set).
- Development of a Stream Restoration Plan to ensure net gain outcomes are achieved in relation to the loss of stream habitat around outfall locations.
- Development of a Native Fish Capture and Relocation Plan to reduce any unnecessary injury and mortality to native fish during outfall construction

The above mitigation and best-practice construction measures should be included as a condition of consent. If these are implemented, the anticipated residual ecological effects are considered to be Very Low.

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Appendix 1: Freshwater Ecological Value Assessment Methodology

The different aquatic ecological assessment methods were applied to inform the ecological value (ranging from Very High to Negligible) of rivers and streams within the ZOI and are consistent with the EIANZ Guidelines. This was done by using all or selected parts of different stream methods (refer Table A1-1) to inform matters influencing the ecological importance and sensitivity of the receiving environment. Each EclA 'Matter' and corresponding method/s used to inform the matter are summarised in Table A1-1.

The ecological value of freshwater features was assessed by assigning a score of 0 (None), 1 (Low), 2 (Moderate), 3 (High) or 4 (Very High) based on professional judgement (with justification) to aspects associated with each of the four ecological matters. The combined ecological value score (ranging from Very High to Negligible), for the four matters, was then determined in accordance with the EIANZ Guidelines.

Table A1-1 - Summary of how different methods of assessment have been applied to inform aquatic ecological value

EclA Matter	SEV	Habitat availability (macroinvertebrates and fish)	Macroinvertebrate community	Fish community
Matter 1 Representativeness	✓		✓	✓
Matter 2 Rarity /distinctiveness		✓		✓
Matter 3 Diversity and pattern	✓	✓		
Matter 4 Ecological context				✓

Appendix 2: Stream photos

Stream 2 site photos



Stream 3A site photos

A) Shortfin eel



B) Exotic rainbow skink caught during site survey



C) Rubbish dumped in stream 3a



D) Stream bank vegetation



Figure A2-2 A) shortfin eels visually evident around stormwater outfall, B) exotic rainbow skink caught during site survey, C) and D) evidence of rubbish/debris dumped in stream channel e.g bricks and table, lack of native vegetation cover demonstrating potential for restoration.

Stream 3b site photos



Appendix 3: Summary of EcIA Value Assessment

Table A3-1 Current stream value assessment

Attributes to be considered	Stream 2	Stream 3a	Stream 3b
Representativeness (including SEV, RHA and ecological integrity)	2	2	2
Instream habitat modification	1	1	1
Riparian habitat modification	2	2	2
Invertebrate assemblage representation	1	1	1
Fish assemblage representation	1	1	1
SEV scores relative to potential score	2	1	2
Rarity/distinctiveness	1	1	1
Species of conservation significance	1	1	1
Range restricted or endemic species	1	1	1
Stream type (rare or distinctive)	1	1	1
Distinctive ecological values (ecosystem services)	1	1	1
Diversity and pattern	2	2	2
Level of natural diversity	2	2	2
Species diversity	1	1	1
Complexity of community	1	1	1
Ecological context (Ecosystem services, importance and sensitivity)	3	3	3
Stream order	3	3	3
Hydroperiod	2	2	2
Sensitivity to flow and water quality modification	1	1	1
Connectivity and migration	1	1	1
Protected status	1	1	1
Combined value	Low	Low	Low

Table A3-2 Potential stream value assessment

Attributes to be considered	Stream 2	Stream 3a	Stream 3b
Representativeness (including SEV, RHA and ecological integrity)	3	3	3
Instream habitat modification	1	1	1
Riparian habitat modification	3	3	3
Invertebrate assemblage representation	1	1	1
Fish assemblage representation	1	1	1
SEV scores relative to potential score	2	1	2
Rarity/distinctiveness	1	1	1
Species of conservation significance	1	1	1
Range restricted or endemic species	1	1	1
Stream type (rare or distinctive)	1	1	1
Distinctive ecological values (ecosystem services)	1	1	1
Diversity and pattern	2	2	2
Level of natural diversity	2	2	2
Species diversity	1	1	1
Complexity of community	1	1	1
Ecological context (Ecosystem services, importance and sensitivity)	3	3	3
Stream order	3	3	3
Hydroperiod	2	2	2
Sensitivity to flow and water quality modification	1	1	1
Connectivity and migration	1	1	1
Protected status	1	1	1
Combined value	Moderate	Moderate	Moderate

Appendix 4: Summary of SEV impact and potential scores

Table A4-1 Summary of SEV scores including current (SEVc), potential (SEVp) and impact (SEVi)

Function category	Section	Function	Variable (code)	SEVc Stream 2	SEVc Stream 3a	SEVc Stream 3b	SEVp Stream 2	SEVp Stream 3a	SEVp Stream 3b	SEVi Stream 2	SEVi Stream 3a	SEVi Stream 3b	
Hydraulic	4.1	NFR	Vchann	0.51	0.51	0.40	0.65	0.65	0.65	0.44	0.44	0.44	
			Vlining	0.90	0.90	0.90	0.90	0.90	0.90	0.52	0.52	0.52	
			Vpipe	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
			=	0.19	0.19	0.17	0.22	0.22	0.22	0.14	0.14	0.14	
Hydraulic	4.2	FLE	Vbank	0.30	0.30	0.30	0.30	0.30	0.30	0.20	0.20	0.20	
			Vrough	0.44	0.51	0.66	1.00	1.00	1.00	0.29	0.29	0.29	
			=	0.13	0.15	0.20	0.30	0.30	0.30	0.06	0.06	0.06	
Hydraulic	4.3	CSM	Vbarr	0.30	0.00	0.30	0.30	0.00	0.30	0.00	0.00	0.00	
			=	0.30	0.00	0.30	0.30	0.00	0.30	0.00	0.00	0.00	
Hydraulic	4.4	CGW	Vchanshape	0.60	0.60	0.68	0.50	0.50	0.50	0.65	0.65	0.65	
			Vlining	0.90	0.90	0.90	0.90	0.90	0.90	0.52	0.52	0.52	
			=	0.80	0.80	0.83	0.77	0.77	0.77	0.56	0.56	0.56	
Hydraulic function mean score				0.36	0.29	0.37	0.40	0.32	0.40	0.19	0.19	0.19	
biogeochemical	4.5	WTC	Vshade	0.76	0.72	0.74	1.00	1.00	1.00	0.24	0.24	0.24	
biogeochemical	4.6	DOM	=	0.76	0.72	0.74	1.00	1.00	1.00	0.24	0.24	0.24	
			Vdod	0.40	0.40	0.40	0.60	0.60	0.20	0.40	0.40	0.40	
biogeochemical	4.7	OMI	Vripar	0.75	0.75	0.80	0.90	0.90	0.90	0.60	0.60	0.60	
			Vdecid	0.78	1.00	0.74	0.78	1.00	0.74	0.63	0.70	0.55	
			=	0.67	0.75	0.69	0.80	0.90	0.78	0.49	0.51	0.46	
biogeochemical	4.8	IPR	Vmacro	0.87	1.00	1.00	0.87	0.87	0.87	1.00	1.00	0.87	
			Vretain	0.62	0.62	0.52	0.70	0.70	0.70	0.58	0.58	0.58	
biogeochemical	4.9	DOP	Vsurf	0.56	0.54	0.61	0.30	0.26	0.31	0.30	0.26	0.31	
			Vripfilt	0.56	0.48	0.64	0.70	0.70	0.70	0.44	0.44	0.44	
			=	0.56	0.51	0.63	0.50	0.48	0.50	0.37	0.35	0.37	
Biogeochemical function mean score				0.60	0.60	0.60	0.72	0.74	0.64	0.42	0.42	0.41	
habitat provision	4.10	FSH	Vgalspwn	0.55	0.85	1.00	0.55	0.85	0.85	0.55	0.85	0.85	
			Vgalqual	0.00	0.25	0.75	0.00	0.25	0.75	0.00	0.25	0.75	
			Vgobspwn	0.80	0.20	0.20	0.80	0.20	0.20	0.80	0.20	0.20	
			=	0.40	0.21	0.48	0.40	0.21	0.42	0.40	0.21	0.42	
habitat provision	4.11	HAF	Vphyshab	0.80	0.69	0.80	0.82	0.69	0.80	0.68	0.60	0.67	
			Vwatqual	0.25	0.24	0.25	0.60	0.60	0.20	0.09	0.09	0.09	
			Vimperv	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
Habitat provision function mean score				0.44	0.32	0.48	0.49	0.36	0.45	0.39	0.28	0.40	
Biodiversity	4.12	FFI	Vfish	0.23	0.23	0.47	0.47	0.47	0.23	0.23	0.23		
			=	0.23	0.23	0.47	0.47	0.47	0.23	0.23	0.23		
Biodiversity	4.13	IFI	Vmci	0.00	0.36	0.30	0.00	0.36	0.00	0.00	0.36	0.00	
			Vept	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Vinvert	0.12	0.23	0.05	0.12	0.23	0.12	0.12	0.23	0.12	
			=	0.04	0.20	0.12	0.04	0.20	0.04	0.04	0.20	0.04	
Biodiversity	4.14	RVI	Vripcond	0.36	0.39	0.52	0.90	0.90	0.90	0.23	0.23	0.23	
			Vripconn	0.49	0.33	0.65	0.49	0.33	0.65	0.39	0.39	0.39	
Biodiversity function mean score				0.15	0.19	0.31	0.31	0.32	0.29	0.12	0.17	0.12	
Overall mean SEV score (maximum value 1)				0.412	0.382	0.454	0.508	0.475	0.466	0.285	0.280	0.284	

Table A4-2 Summary of impact scores and justification of impact

SEV Function	Potential (SEVi-P)			Impact (SEVi)			Justification for predicted scores following stormwater outfall
	Stream 2	Stream 3b	Stream 3b	Stream 2	Stream 3b	Stream 3b	
Natural flow regime (NFR)	0.22	0.22	0.22	0.14	0.14	0.14	Vchann: Armouring portion of stream length, and flow pattern will be affected, flow patterns affects by human rubbish (hydraulic complexity). Vlining: Bank and bed now partially artificial. Vpipe: No change to piped inflow to the impacted length of stream.
Floodplain effectiveness	0.30	0.30	0.30	0.06	0.06	0.06	Vbank: Stream section artificially constrained by stormwater pipe and wider development. Vrough: Artificial concrete surfaces will replace natural stream bed, riparian vegetation removed for stormwater works.
Connectivity for species migration	0.30	0.00	0.30	0.00	0.00	0.00	Vbarr: Complete to partial barrier to fish movement. Stream 3a remains unchanged.
Natural connectivity to groundwater	0.77	0.77	0.77	0.56	0.56	0.56	Vlining: Bank and bed now partially concreted (artificial impermeable lining).
Water temperature control	1.00	1.00	1.00	0.24	0.24	0.24	Vshade: Assumed SEVp very high riparian cover. Construction will result in further vegetation removal from the current SEV score.
Dissolved oxygen levels maintained	0.60	0.60	0.20	0.40	0.40	0.40	Vdod: Assumed reduction in shade, leading to increase in stream temperature. Potential is reduced at Stream 3b owing to the modelled increase in zinc, copper and total petroleum hydrocarbons (TPH).

Organic matter input	0.80	0.90	0.76	0.49	0.51	0.46	Vripar: Assumed SEVp streams of 90% cover, leading to a reduction to 60% cover. Vdecid: Assumed reduction in deciduous vegetation from impact.
In-stream particle retention	0.70	0.70	0.70	0.58	0.58	0.58	Vmacro: Outfall/apron lining will partially prevent particle retention, leading to a reduction in macrophyte growth.
Decontamination of pollutants	0.50	0.48	0.50	0.37	0.35	0.37	Vsurf: Described as artificial bedrock as partially lined. Vripfilt: reduction in filtering activity due to impermeable artificial structure.
Fish spawning habitat	0.40	0.21	0.42	0.40	0.21	0.42	Vgalspwn, Vgalqual, Vgobspwn: No change in spawning habitat, considered already low suitability at potential.
Habitat for aquatic fauna	0.59	0.52	0.58	0.39	0.28	0.40	Vphyshab: Habitat heterogeneity limited to fast shallow flow through outfall. Vwatqual: Catchment-wide water quality will remain the same. Vimperv: Catchment-wide proportion of impervious surfaces will slightly increase through project.
Fish fauna intact	0.47	0.47	0.23	0.23	0.23	0.23	Vfish: Potential assumes Shortfin and Banded Kokopu are present in Stream 2 and Stream 3a. The loss of Banded Kokopu is assumed in Stream 3b, owing to modelled increase in zinc, copper and total petroleum hydrocarbons (TPH) and the sensitivity of this species.
Invertebrate fauna intact	0.04	0.20	0.04	0.04	0.20	0.04	Vmci: Very limited invertebrate habitat, assumes no change at impact.
Riparian vegetation intact	0.44	0.29	0.59	0.09	0.09	0.09	Vripconn: Further reduction to connection between stream and riparian zone.
Mean SEV score	0.508	0.475	0.466	0.285	0.280	0.284	
SEV score reduced by				0.22	0.20	0.19	

Attachment 7 – Updated Proposed Conditions Set

RESOURCE CONSENT CONDITIONS EB3R (Additions to Conditions are underlined)

GENERAL ACCORDANCE

1. Except as modified by the conditions below, the activity must be carried out in general accordance with the plans and information submitted with the application, as follows:

Table 1: Application Documents

Document Title	Author	Revision	Date

Table 2: Drawings

Drawing Title	Designer	Revision	Date

Table 3: Management Plans

Management Plans	Author	Revision	Date

Where there may be an inconsistency between the documents listed in condition 1 above and the requirements of the following conditions, the following conditions prevail.

Advice note: The reports, Management Plans and drawings listed above may be updated in accordance with the processes listed in Condition 12 to 16, subject to the effects of the consented activities remaining within the nature and scale of effects considered by the listed document. Where effects change in nature or increase in scale, the Consent Holder must consult with Council to determine whether a change of conditions is required under s 127 of the RMA.

MONITORING CHARGE

2. The Consent Holder must pay the Council an initial consent compliance monitoring charge of \$X (GST inclusive) plus any further monitoring charge(s) to recover the actual and reasonable costs incurred to ensure compliance with the conditions of these consents.

Advice Note: The initial monitoring deposit is to cover the cost of inspecting the site, carrying out tests, reviewing conditions, updating files, etc., all being work that ensures compliance with the resource consents. In order to recover actual and reasonable costs, monitoring of conditions, in excess of those covered by the deposit, will be charged at the relevant hourly rate applicable at the time. The Consent Holder will be advised of the further monitoring charge(s). Only after all conditions of the resource

consent have been met, will the Council issue a letter confirming compliance at request by the Consent Holder.

LAPSE DATE

3. Under section 125 of the RMA, this consent will lapse ten years after the date it commences unless:
 - a) The consent is given effect to; or
 - b) On application, the Council determines to extend the period after which the consent will lapse.

EXPIRY DATE – LAND USE

4. The land use consent shall expire 5 years after consent has been given effect to.

EXPIRY DATE – COASTAL (OCCUPATION)

5. The coastal permit associated with the occupation of the coastal marine area by the stormwater outfall shall expire 35 years after consent has been given effect to.

EXPIRY DATE – COASTAL (DISTURBANCE)

6. The coastal permit associated with the disturbance of the coastal marine area by stormwater outfalls shall expire 5 years after consent has been given effect to.

EXPIRY DATE – DISCHARGE OF CONTAMINANTS

7. The discharge permit associated with the construction of the Eastern Busway Project (EB3R) shall expire 5 years after consent has been given effect to.

EXPIRY DATE – DISCHARGE OF STORMWATER (NES-FW)

8. The discharge permit associated with the discharge of stormwater to, and within 100 m of a coastal wetland shall expire 35 years after consent has been given effect to.

SITE ACCESS

9. Subject to compliance with the consent holder's health and safety requirements and provision of reasonable notice, servants or agents of Council are permitted to have access to relevant parts of the construction site(s) at reasonable times for the purpose of carrying out inspections, surveys, investigations and/or to take samples.

PRE-CONSTRUCTION CONDITIONS

Mana Whenua Engagement

10. At least 10 working days prior to the commencement of construction, the consent holder shall confirm and submit to Council a framework to ensure appropriate engagement with mana whenua during the construction of the Eastern Busway Project (Package EB3R).

11. The framework shall include:

- a) The methods for identifying and engaging with mana whenua;

- b) The process for involvement of mana whenua in reviewing and the implementation of the management and environmental management plans as they relate to:
 - i. Recognising and providing for the cultural values and interests of mana whenua;
 - ii. Implementing and applying tikanga
 - iii. Managing and monitoring sediment quality; and
 - iv. Promoting ecology and biodiversity, including the use of native vegetation;
- c) As a minimum the matters identified in (b) above shall be addressed in the preparation of the following management plans:
 - i. Construction Environmental Management Plan
 - ii. Urban Design and Landscape Plan
 - iii. Habitat Restoration Plan.

MANAGEMENT PLANS – CERTIFICATION AND REVIEW

Advice Note: Conditions 12 to 16 below, apply to all Management Plans that require certification unless otherwise specified in these conditions or finalised through the resource consent process. Management Plans listed in Condition 1 are deemed certified.

12. Unless listed in Condition 1 above or otherwise stated, all Management Plans required by the conditions of this consent shall be submitted to the Council for certification at least 10 working days prior to commencement of construction works (excluding enabling works, site clearance, site investigations, relocation of services and establishment of site entrances and temporary construction fencing). All works shall be carried out in accordance with the approved Management Plans. No related construction works shall commence until written approval or certification of all relevant Management Plans for those works have been received, unless otherwise approved in writing by the Council.
13. If the consent holder does not receive a written response from Council within 10 working days of the Management Plan(s) being submitted for certification, the Management Plan(s) will be deemed to have certification and the consent holder can commence the related construction works.

Advice Note: The Council will acknowledge receipt of any Management Plan submitted for certification within 2 working days. The Council will confirm if any information required for certification is missing from any submitted management plan within 5 working days. Where no further information is required, the Council will provide certification to the consent holder within 10 working days of submission of the Management Plan. If further information has been requested, the Council will provide confirmation of certification to the consent holder within 5 working days of the requested information being provided.

14. Any certified Management Plan may be amended, if necessary, to reflect any minor changes in design, construction materials, methods or management of effects to align with the conditions of consent. Any amendments are to be agreed by the Council in writing prior to implementation of any changes. Re-certification is not required in accordance with Condition 12, if Council confirms those amendments are within scope and any changes to the draft Management Plans are clearly identified.

15. Any amendments to a certified Management Plan that may result in a materially different outcome shall be submitted to the Council in accordance with Condition 12 to certify these amendments are consistent with the relevant condition(s) prior to implementation of any changes. Where a Management Plan was prepared in consultation with interested or affected parties, any material changes to that Plan shall be prepared in consultation with those same parties.
16. Management Plans may be submitted in parts or stages to address activities or to reflect the staged implementation of the Project. If submitted in part, Management Plans shall clearly show the linkage with the Management Plans for adjacent stages and interrelated activities.

STAKEHOLDER COMMUNICATION AND ENGAGEMENT

17. The consent holder is required to implement and comply with the Communication and Consultation Plan (CCP) listed in Condition 1, unless otherwise amended by the process in Condition 18. The objective of the CCP is to set out a framework to ensure appropriate communication and consultation is undertaken with the community, stakeholders, affected parties and interest groups during construction of the Eastern Busway Project (Package EB3R).
18. Any amendments to the CCP listed in Condition 1 that may result in a materially different outcome or to address unforeseen adverse effects arising from construction must comply with Conditions 19 and 20.
19. The consent holder shall submit the updated or revised CCP to Council for comment. The consent holder shall consider any comments received from Council when finalising the CCP. If the consent holder has not received any comments from Council within 10 working days of submitting the CCP, the consent holder will consider Council has no comments.

Advice Note: The CCP does not require certification from Council.

20. The CCP shall set out how the consent holder will for the Eastern Busway Project (Package EB3R):
 - a) Inform the community and businesses of construction progress, future construction activities and constraints that could affect them;
 - b) Provide information on key project milestones;
 - c) Provide a process for responding to queries and complaints including, but not limited to:
 - i. Who is responsible for responding;
 - ii. How responses will be provided;
 - iii. The timeframes for responses to be provided; and
 - iv. How complaints will be reviewed and monitored to ensure mitigation is effective.

The CCP shall include:

- a) A communications framework that details the consent holders communication strategies, the accountabilities, frequency of communications and consultation, the range of communication and consultation tools to be used (including any modern and relevant communication methods, community noticeboard, local paper, newsletters or similar, advertising etc.) and any other relevant communication matters;

- b) Details of the Communication and Consultation Manager for the Eastern Busway project, including their contact details (phone, email, project website and postal address);
- c) Methods for identifying, communicating and engaging with people affected by the construction works for the project, including but not limited to:
 - i. All residential and business property owners and occupiers directly affected by construction works;
 - ii. All community and education facilities directly affected to construction works for the project, including methods to assist these facilities to consult with their customers/stakeholders;
 - iii. Key stakeholders (including the Council's Parks Department); and
 - iv. Network utility operators.
- d) Methods for communicating with and notifying directly affected parties in advance where practicable of:
 - i. proposed construction activities outside normal working hours (including night works); and
 - ii. Temporary traffic management measures and permanent changes to road networks and layouts.
- h) Details of specific communications proposed for updating stakeholders including affected parties on construction timeframes; and
- i) A list of the stakeholders directly affected to be communicated with.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT

- 21. The consent holder is required to carry out all works in accordance with the Construction Environmental Management Plan (CEMP) listed in Condition 1, unless otherwise amended by the process in Condition 10. The objective of the CEMP is to set out an overarching framework and construction methods to be undertaken to avoid, remedy or mitigate any adverse effects associated with the construction of the Eastern Busway Project (Package EB3R) so far as is reasonably practicable.
- 22. Any amendments to the CEMP listed in Condition 1 that may result in a materially different outcome or to address unforeseen adverse effects arising from construction must comply with Conditions 19 and 20.
- 23. The consent holder must submit the updated or revised CEMP to Council for certification in accordance with Conditions 12 to 16 as soon as practicable following identification of the need for an update as a result of a material change. The purpose of the CEMP is to set out an overarching framework and construction methods to be undertaken to avoid, remedy or mitigate any adverse effects associated with the construction of the Eastern Busway Project (Package EB3R) so far as is reasonably practicable.
- 24. The CEMP shall include details of:

- a) An outline of the construction programme of the work, including construction hours, indicating linkages to the other subsidiary plans which address management of adverse effects during construction;
- b) The document management system for administering the CEMP and compliance, including review and consent holder / constructor / Council requirements;
- c) Training requirements for employees, sub-contractors and visitors for cultural induction, construction procedures, environmental management and monitoring;
- d) Roles and responsibilities for the implementation of the CEMP;
- e) Environmental incident and emergency management procedures (including spills);
- f) Environmental complaint management procedures;
- g) Specific details of demolition and site clearance works to be undertaken;
- h) The location of construction compounds and measures adopted to keep them secure;
- i) Methods to provide for the safety of the general public;
- j) Measures to be adopted to keep the construction areas in a tidy condition in terms of disposal / storage of rubbish and storage, unloading construction materials (including equipment). All storage of materials and equipment associated with the construction works must take place inside the Eastern Busway Project (Package EB3R) boundaries; and
- k) Site reinstatement measures upon completion of the activities including the removal of any temporary structures used during the construction period.

Advice note: The CEMP may be prepared as a combined document that also addresses the matters required under the associated designation and resource consents for the Eastern Busway Project (Package EB2).

TRANSPORT, ACCESS AND PARKING

- 25. The consent holder is required to carry out all works in accordance with the Construction Traffic Management Plan (CTMP) listed in Condition 1, unless otherwise amended by the process in Condition 26. The objective of the CTMP is to identify the means to be used to avoid, remedy or mitigate the adverse effects of construction of the Eastern Busway Project (Package EB3R) on transport, parking and property access so far as it is reasonably practicable.
- 26. Any amendments to the CTMP listed in Condition 1 that may result in a materially different outcome or to address unforeseen adverse effects arising from construction must comply with Condition 27.
- 27. The consent holder shall submit the updated or revised CTMP to Council for comment. The consent holder shall consider any comments received from Council when finalising the CTMP. If the consent holder has not received any comments from Council within 10 working days of submitting the CTMP, the consent holder will consider Council has no comments.

Advice note: The CTMP does not require certification from Council.

CONSTRUCTION NOISE AND VIBRATION MANAGEMENT

28. Construction noise shall be measured and assessed in accordance with New Zealand Standard NZS 6803:1999 'Acoustics - Construction Noise' (NZS6803:1999) and comply with the noise standards set out in the Tables 3 and 4 as far as practicable.

Table 1 Construction Noise Criteria – Residential Receivers (Irrespective of Zoning)

Time of week	Time Period	Maximum noise level (dBA) > 20 weeks	
		L _{eq}	L _{max}
Weekdays	0630 – 0730	55	75
	0730 – 1800	70	85
	1800 – 2000	65	80
	2000 - 0630	45	75
Saturdays	0630 – 0730	45	75
	0730 – 1800	70	85
	1800 – 2000	45	75
	2000 - 0630	45	75
Sundays and public holidays	0630 – 0730	45	75
	0730 – 1800	55	85
	1800 – 2000	45	75
	2000 - 0630	45	75

Table 2 Construction Noise Criteria - Commercial and Industrial Receivers

Time period	Maximum noise level L _{Aeq} dB > 20
07:30 – 18:00	70
18:00 – 07:30	75

29. Where compliance with the noise standards set out in Table 1 and Table 2 above is not practicable, and unless provided for in the Construction Noise Vibration Management Plan (CNVMP) as required by Condition 33, then the methodology in Condition 36 shall apply.

30. Construction vibration shall be measured in accordance with German Standard DIN 4150-3:1999 "Structural Vibration Part 3: Effects of vibration on structures", and shall comply with the vibration standards set out in Table 5 as far as practicable:

Table 3 Construction Vibration Criteria

Vibration Level	Time	Category A	Category B
Occupied activities sensitive to noise	Night-time 2000h – 0700h	0.3mm/s ppv	2mm/s ppv
	Daytime 0700h – 2000h.	2mm/s ppv	5mm/s ppv
Other occupied buildings	All other times	2mm/s ppv	5mm/s ppv
All other buildings	Daytime 0630h – 2000h	Tables 1 and 3 of DIN4150-3:1999	

31. The Category A criteria may be exceeded if the works generating vibration take place for three days or less between the hours of 7am to 6pm, provided that the Category B criteria are complied with, and:
- All occupied buildings within 50m of the extent of the works generating vibration are advised in writing no less than three days prior to the vibration-generating works commencing; and
 - The written advice must include details of the location of the works, the duration of the works, a phone number for complaints and the name of the site manager.
32. Where compliance with the vibration standards set out in Table 5 above is not practicable, and unless otherwise provided for in the CNVMP as required by Condition 33, then the methodology in Condition 36 shall apply.
33. The consent holder is required to implement and comply with the CNVMP listed in Condition 1, unless otherwise amended by the process in Conditions 12 to 16. The objective of the CNVMP is to provide a framework for the development and implementation of the Best Practicable Option (BPO) to avoid, remedy or mitigate the adverse effects on receivers of noise and vibration resulting during construction of the Eastern Busway Project (Package EB3R).
34. Any amendments to the CNVMP listed in Condition 1 that may result in a materially different outcome or to address unforeseen adverse effects arising from construction must comply with Conditions 35 and 36.
35. The consent holder must submit the updated or revised CNVMP to Council for certification in accordance with Conditions 12 to 16 as soon as practicable following identification of the need for an update as a result of a material change.
36. The purpose of the CNVMP is to set out a framework to avoid, remedy or mitigate the adverse effects on receivers of noise and vibration resulting during construction of the Eastern Busway Project (Package EB3R). To achieve this objective, the CNVMP shall be prepared in accordance with Annex E2 of (NZS6803:1999) and shall as a minimum, address the following:
- Description of the works, machinery and equipment to be used;
 - Hours of operation, including times and days when construction activities would occur;
 - The construction noise and vibration standards;
 - Identification of receivers where noise and vibration standards apply;

- e) Management and mitigation options, and identification of the Best Practicable Option;
- f) Methods and frequency for monitoring and reporting on construction noise and vibration;
- g) Procedures for communication as set out in the CCP with nearby residents and stakeholders, including:
 - i. Notification of proposed construction activities,
 - ii. The period of construction activities; and
 - iii. Management of noise and vibration complaints.
- h) Contact details for the Communication and Consultation Manager;
- i) Procedures for the regular training of the operators of construction equipment to minimise noise and vibration as well as expected construction site behaviours for all workers;
- j) Identification of areas where compliance with the noise (Condition 28) and/or vibration standards (Condition 30 Category A or Category B) will not be practicable.
- k) Procedures for:
 - i. Communicating with affected receivers in accordance with the CCP, where measured or predicted noise or vibration from construction activities exceeds the noise criteria of Condition 28 or the vibration criteria of Condition 30; and
 - ii. Assessing, mitigating and monitoring vibration where measured or predicted vibration from construction activities exceeds the Category B vibration criteria of Condition 30, including the requirement to undertake building consent surveys before and after works to determine whether any damage has occurred as a result of construction vibration; and
 - iii. Requirements for review and update of the CNVMP.

37. Unless otherwise provided for in the CNVMP, a Schedule to the CNVMP (Schedule) shall be prepared in consultation with the owners and occupiers of sites subject to the Schedule, when:

- a) Construction noise is either predicted or measured to exceed the noise standards in Condition 28, except where the exceedance of the LAeq criteria is no greater than 5 decibels and does not exceed:
 - i. 0630 – 2000: 2 periods of up to 2 consecutive weeks in any 2 months; or
 - ii. 2000 - 0630: 1 period of up to 2 consecutive nights in any 10 days;
- b) Construction vibration is either predicted or measured to exceed the Category B standard set out in Condition 30 at the receivers.

38. The objective of the Schedule is to set out the BPO for the management of noise and/or vibration effects of the construction activity beyond those measures set out in the CNVMP. The Schedule must include but not be limited to details such as:

- a) Construction activity and location plan, start and finish dates;
- b) the nearest owners and occupiers of the sites to the construction activity;
- c) the predicted noise and/or vibration level for all receivers where the levels are predicted or measured to exceed the applicable standards in Conditions 28 and/or 30
- d) the proposed site-specific noise mitigation
- e) the consultation and outcomes with owners and/or occupiers of properties identified in the Schedule; and
- f) location, times, and types of monitoring.

39. The Schedule shall be submitted to the Council for certification at least 5 working days, except in unforeseen circumstances, in advance of construction works that are covered by the Schedule and shall form part of the CNVMP. If no response is provided from the Council, prior to the planned work date, the Schedule shall be deemed to be certified.

Building condition surveys [in the event environmental specialists identify building condition surveys are necessary]

40. Prior to construction, a building condition survey must be undertaken of any building or structure that has been identified and assessed as potentially affected by vibration damage arising from construction. The identification and assessment requirement must be determined by an independent and suitability qualified person appointed by the consent holder, and based on the criteria below, unless the relevant industry criteria applied at the time or heightened building sensitivity or other inherent building vulnerability requires it. Factors which may be considered in determining whether a building condition survey must be undertaken include:

- a) Age of the building;
- b) Construction types;
- c) Foundation types;
- d) General building condition;
- e) Proximity to any excavation;
- f) Whether the building is earthquake prone or where there is pre-existing damage; and
- g) Whether any basements are present in the building.

41. Where it is determined by an independent and appropriately qualified person appointed by the consent holder prior to construction that a building condition survey is required:

- a) The consent holder must employ an appropriately qualified person to undertake the building condition surveys and that person is required to be identified in the CEMP;
- b) The consent holder must contact owners of those buildings and structures where a building condition survey is to be undertaken to confirm the timing and methodology for undertaking a pre-construction condition assessment;
- c) Should written agreement from owners and occupiers to enter property and undertake a condition assessment not be obtained within three months from first contact, then the consent holder is not required to undertake these assessments;
- d) During the building condition survey, the consent holder must determine whether the building is classified as a vibration sensitive structure;
- e) The consent holder must provide the building condition survey report to the relevant property owner within 15 working days of the survey being undertaken, and additionally it must notify and provide Council with a copy of the completed survey report within 15 working days;
- f) The consent holder must record all contact, correspondence and communication with owners and occupiers and this record is to be available on request for the Council;
- g) The consent holder must undertake a visual inspection when undertaking construction activities likely to generate high levels of vibration if requested by the building owner where a pre-construction condition assessment has been undertaken; and

42. During construction:

- a) The consent holder must implement procedures that will appropriately respond to the information received from any vibration monitors deployed by the acoustic specialist in accordance with the CNVMP. Where necessary this may include temporary cessation of works in close proximity to the relevant building until measures have been implemented to avoid further damage and/or compromising the structural integrity of the building; and
- b) Any damage to buildings and structures resulting from the works must be recorded and repaired by the consent holder and costs associated with the repair will be met by the consent holder. Such repairs, and/or works to repair damage, are limited to what is reasonably required to restore the general condition of the building as described in the building condition survey. Such repairs must be undertaken as soon as reasonably practicable and in consultation with the owner and occupiers of the building.

43. Following construction:

- a) Within three months of the commencement of operation of the Eastern Busway Project (Package EB3R), the consent holder must contact owners of those buildings and structures where a building condition survey was undertaken to confirm the need to undertake a post-construction condition assessment;
- b) Where a post-construction building condition survey confirms that the building has deteriorated as a direct result of construction works relating to the project, the consent holder must rectify the damage at its own cost. Such repairs, and/or works to repair damage, are limited to what is reasonably required to restore the general condition of the building as described in the building pre-condition survey.

URBAN DESIGN AND LANDSCAPING MITIGATION

40. At least 10 working days prior to the commencement of any construction activity the consent holder shall submit an Urban Design and Landscape Plan (UDLP) to Council for certification in accordance with Conditions 12 to 16. The objective of the UDLP is to mitigate any landscape and visual effects of the Eastern Busway Project (Package EB3R).

41. The UDLP shall include:

- a) Urban design details for works:
 - i. Edgewater Station
 - ii. Gossamer Station
 - iii. Ti Rakau Drive widening between Reeves Road and Pakuranga Road.
- b) Landscape design details for works:
 - i. Riverhills Park;
 - ii. Within Ti Rakau Drive.
- c) A maintenance plan and establishment requirements over a three-year period for landscaping and five years for specimen trees following planting.
- d) Lighting, signage and street furniture details for Eastern Busway Project (Package EB3R);

- e) Measures to achieve a safe level of transition for cycling and walking modes, including providing advanced warning and signage to cyclists and pedestrians, and safe and convenient cycling transitions at the ends of the project;
 - f) Design features and methods for cultural expression; and
 - g) Design features associated with the management of stormwater, including both hard and soft landscaping.
42. The consent holder is required to carry out all works out in accordance with the certified UDLP, unless otherwise amended by the process in Conditions 12 to 16 above.
43. At least 1 month prior to the final handover to the Council for future care and maintenance of landscaping on Council land and reserves, the consent holder's representative is to arrange a site walkover with the Council to inspect the new planting areas, and to document any areas of plant health and maintenance that need to be rectified prior to handover.
44. The UDLP planting requirements must be implemented during the first planting season following the project being operational. If the weather in that planting season is unsuitable for planting, as determined by the Council, the landscaping must instead be implemented at the first practicable opportunity thereafter. The next practicable opportunity must be agreed to by the Council.

TREE WORKS

45. The consent holder is required to carry out all works in accordance with the Tree Protection and Management Plan (TPMP) listed in Condition 1, unless otherwise amended by the process in Conditions 12 and 16 above. The objective of the TPMP is to avoid, remedy or mitigate any adverse construction effects of the Eastern Busway Project (Package EB3R) on those trees to be retained as far as reasonably practicable.
46. Any amendments to the TPMP listed in Condition 1 that may result in a materially different outcome or to address unforeseen adverse effects arising from construction must comply with Conditions 47 and 48.
47. The consent holder must submit the updated or revised TPMP to Council for certification in accordance with Conditions 12 to 16 as soon as practicable following identification of the need for an update as a result of a material change. The purpose of the TPMP is to avoid, remedy or mitigate any adverse construction effects on those trees to be retained as part of the Eastern Busway Project (Package EB3R) as far as reasonably practicable.
48. To achieve its objective, the TPMP is to include:
- a) Tree protection measures for trees to be retained;
 - b) Tree pruning measures;
 - c) Demarcation of temporary construction access and storage areas, outside the permeable dripline and / or rootzone areas of retained trees;
 - d) Use of protective barrier fencing;

- e) Procedures for working within the dripline/rootzone of any retained tree, including appointment of a qualified Council approved arborist (“appointed arborist”) to oversee directly all works within the dripline and rootzone of the trees located in the designated areas of work for the duration of the site works, until the route is considered completed, and including any reinstatement works;
 - f) Specific bio-security removal restrictions that will apply to all elms (*Ulmus* sp.) and kauri (*Agathis australis*), to avoid the risk of spread of Dutch Elm Disease or kauri dieback, including vetting and approving the methodology and treatment of the Elm and kauri material by the Council’s arboricultural specialist responsible for handling and treatment of all Elm/kauri material controlled under the Biosecurity Act, prior to any works taking place; and
 - g) Measures to provide for clear marking of all tree removals prior to implementation of each stage of the works, with verification of the removals by the consent holder’s arborist in consultation with the Council’s arboricultural specialist.
49. If the design of the project is modified so that it becomes apparent that trees protected by the provisions of the AUP(OP) identified as being retained in the approved Tree Plans appended to the Arboricultural Effects Assessment in Condition 1 are required to be removed, then the removal of the trees is appropriate if:
- a) The design modification results in retention of a tree that was identified to be removed (i.e. no net loss of protected trees); or
 - b) If the design modification will result in a net loss of protected trees, a suitable replacement specimen tree is provided in the project corridor (in addition to the proposed planting shown on the approved Tree Plans appended to the Arboricultural Effects Assessment in Condition 1).

Advice Note: Protected trees refers to trees within the road reserve and Council reserves that more than 4m in height and/or more than 400mm in girth. It also includes any trees listed in Schedule 10 “Notable Trees” in the AUP(OP).

HERITAGE

50. In the event that any unrecorded historic heritage sites are identified as a result of the Eastern Busway Project (Package EB3R), then these sites must be recorded by the consent holder for inclusion in the Council’s Cultural Heritage Inventory. The consent holder’s historic heritage expert must prepare documentation suitable for inclusion in the Inventory and forward that information to the Manager: Heritage Unit, heritageconsents@aucklandcouncil.govt.nz within one calendar month of completion of work on the route.
51. Electronic copies of all historic heritage reports relating to historic heritage investigations of whatever form (i.e. evaluation, monitoring and excavation) in regard to the works, are to be submitted by the consent holder’s project historic heritage expert to the Monitoring officer(s) within 12 months of completion of the Eastern Busway Project (Package EB3R).

LAND DISTURBANCE

53. All works must be in accordance with the Erosion and Sediment Control Plan (ESCP) listed in Condition 1, unless otherwise modified by the process in Conditions 12 to 16 above. The purpose of the ESCP is to provide overarching principles and procedures to manage the environmental impacts associated with erosion and sediment control (ESC) during construction of the Eastern Busway Project (Package EB3R).
54. Prior to the commencement of earthworks within a given area or stage, a Site Specific Erosion and Sediment Control Plan (SSESCP) must be prepared in accordance with Auckland Council's Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region Guideline Document 2016/005 ("GD05") and submitted to Council for certification. No earthworks activity within the specific area or stage must commence until the Council has certified that the SSESCP satisfactorily meets the requirements of GD05.

The SSESCPs must contain sufficient detail to address the following matters:

- a) Contour information;
 - b) ESC measures for the works being undertaken within a particular construction area;
 - c) Chemical treatment design and details;
 - d) Catchment boundaries of works and devices installed;
 - e) Location of the work;
 - f) Details of construction methods;
 - g) Design criteria, typical and site-specific details of erosion and sediment control; and
 - h) Design details for managing the treatment, disposal and/or discharge of contaminants (e.g. concrete wash water).
55. The erosion and sediment control measures must be constructed and maintained in general accordance with the Council's GD05 and any amendments to that document, except where a higher standard is detailed in the documents listed in these consent conditions, in which case the higher standard is to apply.
56. Within 10 working days following implementation and completion of the specific erosion and sediment control works referred to in a SSESCP required by Condition 54, and prior to the commencement of earthworks activity within the subject area or stage referred to in the SSESCP, a suitably qualified and experienced person must provide written certification that the erosion and sediment controls have been constructed and completed in accordance with the SSESCP for that particular area of stage.

Advice note: *The certified controls are to include the decanting earth bunds, sediment retention ponds, clean and dirty water diversions, silt fences, and stabilised construction should contain sufficient details to address the following matters:*

- a) *Details on the contributing catchment area*

- b) *Retention volume of structure (dead storage and live storage measured to the top of the primary spillway)*
- c) *Dimensions and shape of structure(s)*
- d) *Position of inlets/outlets and*
- e) *Stabilisation of the structure(s)*

57. The operational effectiveness and efficiency of all erosion and sediment control measures specifically required in Condition 54 to 56 must be maintained throughout the duration / each stage of earthworks activity, or until the site is permanently stabilised against erosion.

58. The consent holder shall take all practical measures to prevent deposition of soil on roads and footpaths outside the works area of Eastern Busway Project (Package EB3R). In the event that deposition of earth, mud, dirt or other debris on any road or footpath outside the works area resulting from earthworks activity on the project area occurs, it is to be removed immediately. In no instance are roads and/or footpaths to be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses and/or receiving waters.

Advice Note: The following methods may be adopted to prevent or address discharges should they occur:

- a) *Provision of a stabilised entry and exit(s) point for vehicles*
- b) *Provision of wheel wash facilities*
- c) *Ceasing vehicle movements until materials are removed*
- d) *Cleaning road surfaces using street-sweepers*
- e) *Silt and sediment traps and*
- f) *Catchpits.*

In no circumstances should washing deposited materials into drains be advised or otherwise condoned. It is recommended that you discuss any potential measures with the Council's monitoring officer who may be able to provide further guidance on the most appropriate approach to take. Please contact the Council for more details. Alternatively, please refer to GD05.

59. On completion or abandonment of earthworks, all areas of bare earth must be permanently stabilised against erosion as defined by GD05.

Advice Note: Stabilisation measures may include:

- a) *Use of mulch*
- b) *Top-soiling and grassing otherwise bare areas of earth*
- c) *Aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward.*

60. The sediment and erosion controls at the site of the works are to be inspected on a regular basis and within 24 hours of each rainstorm event that is likely to impair the function or performance of the erosion and sediment controls. A record is to be maintained of the date, time and any maintenance undertaken in association with this condition which is to be forwarded to the Council on request.

CONTAMINATED LAND

61. Discharges from disturbance of contaminated soil must be carried out in accordance with the Contaminated Land Management Plan (CLMP) listed in Condition 1 unless otherwise modified by the conditions below or in accordance with Conditions 12 to 16 above.
62. An appropriately qualified and experienced contaminated land specialist must be engaged to oversee the earthworks in areas of potential contamination. All sampling and testing of contamination on the site must be overseen by the appropriately qualified and experienced contaminated land practitioner. All sampling is to be undertaken in accordance with the *Contaminated Land Management Guidelines, No-5 - Site Investigation and Analysis of Soils*, Ministry for the Environment, revised 2021.

Advice Note: All testing and analysis should be undertaken in a laboratory with appropriate experience and ability to carry out the analysis. For more details on how to confirm the suitability of the laboratory please refer to Part 4: Laboratory Analysis, of Contaminated Land Management Guidelines No.5

63. The Council is to be informed in writing about the commencement of the Eastern Busway Project (Package EB3R) works at least 2 working days prior to commencement.

Advice Note: Discharge from the site includes the disposal of water (e.g. perched groundwater or collected surface water) from the remediation area.

64. Any soils and/or fill material identified as contaminated and requiring off-site disposal are to be loaded directly into trucks and covered during transportation off site in accordance with the CLMP. All soil removed from the land disturbance area must be deposited at a suitably certified facility.
65. All imported fill must comply with the definition of 'cleanfill', in accordance with 'A Guide to the Management of Cleanfills', Ministry for the Environment (2002).

Advice Note: Background levels for the Auckland region can be found in the Council's technical publication TP153 "Background concentrations of inorganic elements in soils from the Auckland Region" (2001).

66. Within three months of the completion of the soil disturbance activities within the project area, a Site Completion Report (SCR) must be provided to the Council.
67. The SCR must contain sufficient detail to address the following matters:

- a) A summary of the works undertaken, including a statement confirming whether the excavation of the site has been completed in accordance with the CLMP
- b) A summary of inspections and oversight completed by the SQEP.
- c) The location and dimensions of the excavations carried out, including a site plan.
- d) A summary of testing undertaken (if applicable) including tabulated analytical results.
- e) Records of any unexpected contamination encountered during the works and contingency measures undertaken (if applicable).
- f) Details of any validation soil sampling completed in areas of unexpected soil contamination and vicinity of fill material previously identified as exceeding the adopted soil acceptance criteria (if applicable).
- g) Copies of the disposal dockets for the contaminated fill and 'cleanfill' material removed from the site.
- h) Copies of the SQEP site inspection documentation.
- i) Details regarding any complaints and/or breaches of the procedures set out in the certified CLMP, and how any incidents or complaints were addressed.
- j) Results of testing, if required, of any spoil disposed offsite.
- k) Results of testing of any imported fill material.
- l) Identification of any areas which need on-going monitoring and management.

68. Where contaminants are identified that have not been anticipated by the application, the unexpected discovery procedures in the CLMP as identified in Condition 1 must be employed, including notifying the Council. Any unexpected contamination and contingency measures must be documented in the SCR.

Advice Note: Unexpected contamination may include contaminated soil, perched water or groundwater. The consent holder is advised that where unexpected contamination is significantly different in extent and concentration from that anticipated by the original site investigations, handling the contamination may be outside the scope of this consent. Advice should be sought from the Council as to whether carrying out any further work in the area of the unexpected contamination is within scope of this consent.

CONTAMINATED LAND – ENVIRONMENTAL HEALTH

- 69. All works are to be in accordance with the CLMP listed in Condition 1, unless otherwise amended by the process in Conditions 12 to 16 above. The CLMP must be prepared, implemented and reported in accordance with Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 ('NES: Soil') by an appropriately qualified and experienced professional.
- 70. An appropriately qualified and experienced contaminated land specialist must be engaged to oversee the earthworks in areas of potential contamination.
- 71. Works must cease in the vicinity of any contamination not previously identified and the Council must be advised immediately. Works can recommence once the unexpected discovery protocols

noted in the section for 'Unexpected Discovery of Land Contamination' in the certified CLMP have been satisfied.

ECOLOGY

72. The Consent Holder shall implement the Lizard Management Plan (LMP) listed in Condition 1, unless otherwise amended by the process in Conditions 12 to 16 above. The purpose of the LMP is to avoid, remedy or mitigate adverse effects on native lizards associated with vegetation and site clearance, as far as is reasonably practicable.

Advice note: A permit under the Wildlife Act 1953 will be required from the Department of Conservation to enable lizard salvage to occur.

73. Any amendments to the LMP listed in Condition 1 that may result in a materially different outcome or to address unforeseen adverse effects arising from construction must comply with Conditions 74 and 75.
74. The consent holder must submit the updated or revised LMP to Council for certification in accordance with Conditions 12 to 16 as soon as practicable following identification of the need for an update as a result of a material change.
- a) The LMP must address the following (as appropriate): Credentials and contact details of the ecologist/herpetologist who will implement the plan;
 - b) Timing of the implementation of the LMP.
 - c) A description of methodology for survey, salvaging and relocation of lizards rescued including but not limited to:
 - i. Salvage protocols;
 - ii. Relocation protocols (including method used to identify suitable relocation site(s));
 - iii. Diurnal capture protocols;
 - iv. Supervised habitat clearance/transfer protocols;
 - v. Artificial cover object protocols; and
 - vi. Opportunistic relocation protocols.
 - d) A description of the relocation site(s) (refer also Condition 76) including discussion of:
 - i. Provision for additional refugia, if required (e.g. depositing salvaged logs, wood or debris for newly released skinks that have been rescued);
 - ii. Any protection mechanisms (if required) to ensure the relocation site is maintained (e.g.) covenants, consent notices etc; and
 - iii. Any weed and pest management to ensure the relocation site is maintained as appropriate habitat.
 - e) Monitoring methods, including but not limited to the following:
 - i. Ongoing surveys to evaluate translocation success pre- and post-translocation surveys for 3 years; and

- ii. Monitoring of effectiveness of pest control and/or any potential adverse effects on lizards associated with pest control.
 - f) A post vegetation clearance for remaining lizards;
 - g) A suitably qualified and experienced ecologist/herpetologist approved to oversee the implementation of the LMP must certify that the lizard related works have been carried out according to the certified LMP within two weeks of completion of the vegetation clearance works; and
 - h) Upon completion of works, all findings resulting from the implementation of the LMP must be recorded by a suitably qualified and experienced ecologist/herpetologist approved by the Council on an Amphibian/Reptile Distribution Scheme (ARDS) Card (or similar form that provides the same information) which must be sent to Council.
75. At least 10 working days prior to the commencement of any construction activity, the consent holder shall submit a Habitat Restoration Plan (HRP) to Council for certification in accordance with Conditions 12 to 16.

Advice Note: Riparian and coastal margins are defined by Chapter E26 (Infrastructure) and Chapter J (Definitions) of the AUP(OP).

76. The purpose of the HRP is to detail the site specific lizard habitat restoration measures which addresses the impacts of the Eastern Busway Project (Package EB3R) on lizard habitat as identified within the '*Eastern Busway: Ecological Impact Assessment report*'.
- a. The HRP should be developed in accordance with the conditions of the LMP (Condition 72), in order to ensure the habitat(s) that lizards are relocated to will support viable native lizard populations for all species present pre-development.
 - b. The HRP should include:
 - i. Identification of areas to be restored as lizard habitat to the quantum of 0.3ha as identified in '*Eastern Busway: Ecological Impact Assessment report*';
 - ii. Detail of the restoration required at each site to replace and enhance lizard habitat including the planting design (including vegetation to be retained), and supplementary refuges;
 - iii. All plantings shall be demarcated and protected by fencing (where appropriate);
 - iv. A programme of establishment and post establishment protection and maintenance of plants (fertilising, weed removal/spraying, replacement of dead/poorly performing plants, watering to maintain soil moisture, maintenance programme). All plantings shall be maintained for a minimum of the 3 years; and
 - v. Details of the proposed plant species, plant sourcing (locally EcoSourced native pioneer species that are adapted to the Auckland environment are preferred in the first instance), plant sizes at time of planting, plan of the planted area within the planting area required, density of planting, and timing of planting.
77. The HRP planting requirements must be implemented during the first planting season following the Eastern Busway Project (Package EB3R) being operational. If the weather in that planting season is

unsuitable for planting, as determined by the Council, the landscaping must instead be implemented at the first practicable opportunity thereafter. The next practicable opportunity must be agreed to by the Council.

78. At least 10 working days prior to the commence of works on outfalls MCC108699, MCC108703 and MCC108707, the consent holder shall submit a Stream Restoration Plan to Council for certification in accordance with Condition 79.
79. The purpose of the SRP is to detail the measures to address the effects associated with stream disturbance and riparian vegetation clearance associated with the works on outfalls MCC108699, MCC108703 and MCC108707. The SRP shall include:
- a. Description of mitigation offset stream locations and compensation to be implemented at each stream location, including scope, methodology and timing;
 - b. Removal of exotic species within the affected riparian zone;
 - c. Replanting of 10 m of native plantings on each bank to ensure canopy cover to >90% in 10 years. All native species shall be Eco-sourced (where practicable)
 - d. Landscape plan of plant species proposed including location and spacing;
 - e. Removal of rubbish and debris in stream channel; and
 - f. Maintenance and monitoring methods, including measurable outcomes for success over a period of 5 years.
80. At least 10 working days prior to the commence of works on outfalls MCC108699, MCC108703 and MCC108707, the consent holder shall submit a Native Fish Capture and Relocation Plan (NFCRP) to Council for certification in accordance with Condition 81.
81. The purpose of the NFCRP is to safety capture and relocation native fish prior to the commencement of works on outfalls MCC108699, MCC108703 and MCC108707. The NFCRP shall include:
- a. Details on timing of plan implementation, taking into account native fish migration and potential inanga spawning (Nov to May);
 - b. Methodologies to capture native fish;
 - c. Details of the qualified ecologist to undertake the capture and relocation and to be present on-site during dewatering to rescue and relocate any remaining fish present;
 - d. Details of the relocation site(s); and
 - e. Storage and transport measures.

COASTAL PERMIT (CST xx)

82. Prior to any works in the Coastal Marine Area (CMA) commencing, a final construction methodology should be included within the relevant SDESCP required in accordance with Condition 54. Details to be provided should include, but should not be limited to timing, staging and sequencing of coastal works, and the erosion sediment control measures to be employed to mitigate the effects on the receiving environment.

OPERATIONAL TRAFFIC NOISE

83. Noise walls of 1.8m in height above ground level constructed from materials compliant with the mitigation requirements of New Zealand Standard NZS 6806:2010 - 'Acoustics – Road traffic noise - New and altered roads, as shown on the approved plans listed in Condition 1, shall be installed at 2 Wheatley Avenue, 4 Edgewater Drive and 148 Edgewater Drive, Pakuranga prior to Eastern Busway Package EB3R being operational so far as is reasonably practicable.

Advice Notes

1. *Any reference to a number of days in this decision refers to working days as defined in section 2 of the RMA.*
2. *For the purpose of compliance with the conditions of consent, "the Council" refers to the Team Leader Compliance Monitoring – Southern or their delegated representative unless otherwise specified.*
3. *The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those required under the Building Act 2004 and the Heritage New Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable statutes (including the Property Law Act 2007 and the Health and Safety at Work Act 2015), regulations, relevant bylaws, and rules of law. This consent does not constitute a building consent approval. Please check whether a building consent is required under the Building Act.*
4. *An Accidental Discovery Protocol for areas of the Project not covered by an Archaeological Authority granted under the Heritage New Zealand Pouhere Taonga Act 2014 shall be developed in consultation with mana whenua.*
5. *The Accidental Discovery Protocol for areas of the Project not covered by an Archaeological Authority granted under the Heritage New Zealand Pouhere Taonga Act 2014 shall be consistent with the Accidental Discovery rules (Chapter E11) of the Auckland Unitary Plan Operative in Part or any subsequent version.*

21 FEBRUARY 2023

NOISE AND VIBRATION RESPONSE – EB2

21 February 2022

Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

Attention: Warwick Pascoe - Principal Project Lead, Auckland Council

Dear Warwick

Re. Response to Council further information – EB2 Notice of Requirement and Resource Consent Application Package

I am writing in regard to Auckland Council's (the Council) further information request in respect noise and vibration in EB2, in respect to World Health Organisation (WHO) guidelines. A technical response in relation to this matter is attached to this letter.

Furthermore, the Eastern Busway Alliance (EBA) can provide further detail in regard to Industrial Trade Activity (ITA) queries raised by Arsini Hanna. The EBA can confirm that there will not be any petroleum or coal product manufacturing (including bitumen/asphalt premix or hot mix) or refueling plants within the project areas.

The laydown yard at 169/171 Pakuranga Road has an existing resource consent approved for use of this facility for duration of the Project (Council Reference: LUC60403744). This site will be used, in part, to store construction materials. Council's monitoring officers have undertaken regular inspections of this site, with no concerns raised to date. It is also noted that the project office at 5 Reeves Road is to house office related activities. It is not used for the storage of construction materials.

Furthermore, a construction environmental management plan (CEMP) has been drafted and submitted to Council as part of the EB2 application package. It is noted that the CEMP is required (as per the proposed conditions) spill and ITA activity catchment controls for the operation of a polymer plant at 26 Ti Rakau Drive.

While this is a different location from that previously proposed (2 Reeves Road), no additional resource consents are triggered given the permitted activity status of the polymer plant itself and will be located within the designation sort for EB2. The plant will have the same footprint as the polymer plant identified in 2 Reeves Road and will comply with the Permitted Activity requirements of the Unitary Plan.

The polymer plant has been relocated, in part, given Auckland Transport's recent acquisition of 26 Ti Rakau Drive from private owners. It should be noted that the relocation of the polymer part avoids the loss of parking at Pennell Place, thereby reducing the Project's effects on parking availability within Pakuranga Town Centre. It also avoids the need to relocate the businesses at 2 Reeves Road.

Given the above and the attached technical assessment, we consider that all outstanding ITA and noise/vibration matters related to EBA have been resolved.

Yours sincerely,



Matt Zame
Eastern Busway Alliance Director

Attachment 1 – EB2 Noise and Vibration Response

Date	20 February 2023
To	Auckland Council
From	Shivam Jakhu
Subject	EB2 S92 response – Acoustics

Hi Sonja,

I am writing this letter to address the matters raised by Auckland Council regarding our responses to their S92 request.

Please note that a reproduction of the assessment of effects section from the road traffic noise assessment report is provided in the attached memo. This text has been amended to reflect changes to the assessment of effects following the S92 request.

Question 45:

Auckland Council response: Request partly satisfied. Two tables have been produced in the response where only one is required. Having to move between two tables makes it harder to understand the effects, in the context of reports that are already very lengthy. The revised / new tables need to be incorporated into the original reports, ideally as an update to the original Table 12 as suggested. The request also suggested that the same receiver-count could be done for vibration effects, but this has not been responded to. Updating the original report to add receiver counts to tables 12 and 13 would satisfy the request.

In order to make the response to this question clearer, one table covering noise effects is provided below.

We have chosen not to produce a table of effects and counts of affected receivers per level for vibration since we consider this could be potentially misleading – vibration predictions are generally for worst-case levels only, and these levels would usually only happen at a given receiver intermittently. Also, vibration levels measured on site always tend to be lower than those predicted. We have therefore only provided the distances at which exceedances of the vibration criteria could potentially occur to reflect the high-level nature of the vibration assessment.

<i>External Noise Level, dB L_{Aeq}</i>	<i>Approximate Corresponding Internal Noise Level, dB L_{Aeq}</i>	<i>Potential daytime effects, outdoors</i>	<i>Potential daytime effects, indoors</i>	<i>Count of receivers affected during worst case scenario (concrete saw, 30% on-time, with mitigation)</i>	<i>Count of receivers affected during typical scenario (excavator, with mitigation)</i>
65 - 70	45 - 50	<i>People would not want to spend any length of time outside, except when unavoidable through workplace requirements</i>	<i>Noise levels would be noticeable but unlikely to interfere with residential or office daily activities.</i>	0	11

External Noise Level, dB L_{Aeq}	Approximate Corresponding Internal Noise Level, dB L_{Aeq}	Potential daytime effects, outdoors	Potential daytime effects, indoors	Count of receivers affected during worst case scenario (concrete saw, 30% on-time, with mitigation)	Count of receivers affected during typical scenario (excavator, with mitigation)
70 - 75	50 - 55	Businesses that involve substantial outdoor use would experience considerable disruption.	Concentration would start to be affected. TV and telephone conversations would begin to be affected.	14	25
75 - 80	55 - 60	Some people may choose protection for long periods of exposure. Conversation would be very difficult, even with raised voices.	Phone conversations would become difficult. Personal conversations would need slightly raised voices. Office work can generally continue, but 55 dB is considered by the experts to be a tipping point for offices. For residential activity, TV and radio sound levels would need to be raised.	26	8
80 - 85	60 - 65	Hearing protection would be required for prolonged exposure (8 hours at 85 dB) to prevent hearing loss.	Continuing office work would be extremely difficult and become unproductive. In a residential context, people would actively seek respite.	4	2
85 - 90	65 - 70	People would not want to spend any length of time outside, except when unavoidable through workplace requirements	Untenable for both office and residential environments. Unlikely to be tolerated for any extent of time.	8	8

Question 46

Request partly satisfied. This response provides helpful insight into the very approximate durations that groups of receivers are expected to be exposed to noise and vibration levels greater than the project standards. I think it would be helpful for the response to be reformatted and categorised into the three durations set out in the request in a clear and succinct manner - i.e.:

- a) **Receivers exposed to noise levels above the Project Standards for up to 1 week – Dwellings screened from the works by at least one other dwelling, etc etc**
- b) **Receivers exposed to noise levels above the Project Standards for 1 week to 4 weeks – Dwellings near to etc etc**

This could be done when integrated into the original report.

The response has been re-formatted into a table as requested below. Please note that vibration measurements on site always tend to be lower than those predicted, and the table below is based on predictions.

Relative position of receiver to EB2 works	Approximate duration of exposure to noise above the daytime 70 dB LAeq noise criterion for the total duration of the works	Approximate duration of exposure to vibration levels above the daytime Category A 2 mm/s PPV criteria for the total duration of the works	Approximate duration of exposure to vibration levels above the daytime Category B criteria for the total duration of the works
<i>Directly facing construction works that are fixed in place, i.e. RRF construction works</i>	<i>Cumulative total of 4 weeks</i>	<i>Cumulative total of 4 weeks</i>	<i>Cumulative total of 1-4 weeks*</i>
<i>Directly facing construction works that will progress linearly</i>	<i>Cumulative total of 1-4 weeks</i>	<i>Cumulative total of 1-4 weeks</i>	<i>Cumulative total up to 1 week</i>
<i>Set back one row of houses from works that will progress linearly</i>	<i>Cumulative total up to 1 week</i>	<i>Cumulative total up to 1 week</i>	<i>No exceedances</i>

**Note that Te Tuhi and Eastside Pups Dog Grooming are not expected to experience vibration levels above the Category B criteria.*

Question 47:

Request satisfied. The response could very usefully be integrated into the original report under the assessment of effects section. The description of effects could be separated for each receiver with sub-headings as appropriate.

No further response required.

Question 48

Request partly satisfied. Neither 47, 48 or 49 make it explicit that there is likely to be significant adverse effects. Integration with the original report and the response to request 47 would be helpful, as would be clear acknowledgement that the effects will be significant, even with mitigation. It may be possible to reduce the effects so they are not significant, but this will be dependent on the practicability of mitigation itself. Because we don't know yet if the mitigation will be practicable to implement, the response / revised report should make it clear that the effects may be significant at the specified receivers.

If the mitigation measures set out in our response to the S92 request are not followed, noise effects potentially could be significant. However, if the mitigation measures are followed, noise will be kept to levels that are compliant with the relevant criteria for the majority of the works, therefore we consider that noise effects will not be significant.

If the mitigation and management measures set out in the CNVMP are implemented, it is unlikely that the Category B vibration criteria will be exceeded at any buildings, therefore we consider that vibration effects will not be significant.

Question 49

Request partly satisfied. The response does not provide a clear objective or likely outcome that the mitigation is designed to achieve – it simply refers to vibration being ‘managed’. Does this mean it will be managed so that the effects / disruption will not be significant (e.g mostly tolerable) or will the nature of the works be such that disruption will be likely for more than short periods to the extent that the business may not be able to trade normally? The first bullet point seems to make it unequivocal that the works will be managed around the sensitivity receiver in all cases. If this is the case, please confirm. If the works will not always be able to be managed around the sensitivity of the receiver, what will the effect be?

No businesses or activities that are particularly sensitive to vibration were identified within the EB2 alignment, so this response is not relevant for EB2.

Question 50

Request satisfied.

No further response required.

Question 51

Request partly satisfied. The response confirms that the noise models have been adjusted to reflect the different speed environments appropriately. However, the updated data is shown only in lengthy tables by-receiver as an appendix to the response. The categorisation and summaries of this data is an important factor in the overall assessment of noise effects. Such summaries of the original data can be found in the original assessment in many places. For example, table 6-1, the text in section 6.1, right through section 6.2, very significantly at Figures 7 and 8 and the accompanying text, much of section 6.3 and numerous individual statements throughout the report including in the conclusions. The revised predictions need to be integrated into the original noise report and all consequential changes made. The Appendices showing the noise level predictions and categorisation of PPFS also need updating. This is critical to allow the submitters and decision makers to understand the effects.

A clear re-production of the assessment of effects section from the road traffic noise assessment report is provided in the attached memo. This text has been amended to reflect changes to the assessment of effects following the S92 request.

Question 52

The additional assessment of diesel bus noise is helpful, but the assessment appears to be limited to diesel buses idling only, and using an LAeq descriptor with no reference time interval stated. Can the assessment be updated (and integrated into the original report) in a way that addresses the noise of diesel buses idling and accelerating away, and using a descriptor and reference time interval that adequately describes the effects that will be experienced by the closest receivers. This may involve a short reference time period, particularly for buses in use at night time.

The noise level prediction for buses idling will remain the same regardless of the time descriptor used, since the calculation assumed that the bus would be idling continuously.

An additional calculation for buses pulling away has been carried out. Based on data measured by AECOM, the instantaneous sound power level of a bus pulling away is approximately 100 dB L_{WA}. This would correspond to a noise level of 60 dB L_{Aeq} at the façade of 23 Ti Rakau Drive (the closest PPF to the bus stop at 26 Ti Rakau Drive, approximately 40m away). This is at a similar level to the measured ambient noise in the area during the night-time period and is significantly below the measured ambient noise in the area during the daytime period.

The noise level prediction of 60 dB L_{Aeq} assumes a continuous noise source. In reality, the maximum noise level from a bus pulling away will only last for a few seconds before dropping rapidly as the noise source moves away from a given receiver. Therefore, a conservative estimate of the actual noise level measured over a shorter reference time period, for example L_{Aeq(10 seconds)}, would be 55 dB L_{Aeq(10 seconds)}, which is below the existing ambient noise levels in the area.

We therefore consider that noise from diesel buses pulling away at bus stops will not appreciably change the existing ambient night-time noise environment near the bus stop, therefore noise effects from diesel buses pulling away will be negligible.

Question 53

Request not satisfied. The response does not address the request adequately. The request seeks a “meaningful and sufficiently detailed assessment of the noise effects that refers to, and explains the effects of the project against, the objectives of the World Health Organisation Environmental Noise Guidelines for the European Region (2018) and the specific recommendations for road traffic noise. This should include any statistical analysis to demonstrate how the predicted noise levels compared to the recommendations.”

The response only focusses on the number of PPFs that are exposed to more than or less than 50dB LAeq(24hr). The response includes maps that show the noise levels from 50dB LAeq(24hrs) upwards. The response does not contain any explanation of the effects, any assessment against the objectives and recommendations of the WHO guidance, or any meaningful and sufficiently detailed assessment of the noise effects.

For context, the summary recommendations for road traffic noise are:

- *For average noise exposure, the GDG strongly recommends reducing noise levels produced by road traffic below 53 dB L_{den}, as road traffic noise above this level is associated with adverse health effects.*
- *For night noise exposure, the GDG strongly recommends reducing noise levels produced by road traffic during night time below 45 dB L_{night}, as road traffic noise above this level is associated with adverse effects on sleep.*
- *To reduce health effects, the GDG strongly recommends that policy-makers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions, the GDG recommends reducing noise both at the source and on the route between the source and the affected population by changes in infrastructure.*

The response needs to be expanded considerably to address the request and to address the recommendations of the WHO guidance. The full response should be integrated into the main report.

The conversion from L_{den} should be taken from locally sourced data contained in Appendix C to the original report. This is an easy calculation and will provide a more relevant and accurate conversion

between the WHO guidance and the descriptors used in NZS6806. L_{night} can be determined from the locally measured data.

Research undertaken by the WHO¹ has identified that long-term exposure to noise levels above 50 dB L_{Aeq} can have negative impacts on physical and mental health and wellbeing. High noise levels can lead to annoyance, lack of concentration and sleep disturbance, which in turn can cause other health issues.

We have been liaising with the Council peer reviewer across other AT projects about our approach on addressing health effects from road traffic noise. The approach set out below is consistent with that undertaken on other projects.

The WHO guidelines state that there is evidence indicating that annoyance may be a cause of cardiovascular and metabolic diseases. The WHO guidelines provide a method to calculate an estimation of the percentage of people potentially highly annoyed based on noise levels incident at the façades of dwellings. The relationship is based on a regression equation derived from a systematic review of studies relating road traffic noise and annoyance.

Adopting the regression equation, the count of potentially highly annoyed people can be calculated as follows:

- Count of people potentially highly annoyed = (1) * (2), where
 - (1) = population (count) exposed to specific dB $L_{Aeq(24h)}$ noise level
 - (2) = $78.9270 - 3.1162 \times (L_{Aeq(24h)}+3) + 0.0342 \times (L_{Aeq(24h)}+3)^2$ (exposure-response function)²

Population estimations per dwelling were derived from information available from Statistics New Zealand³.

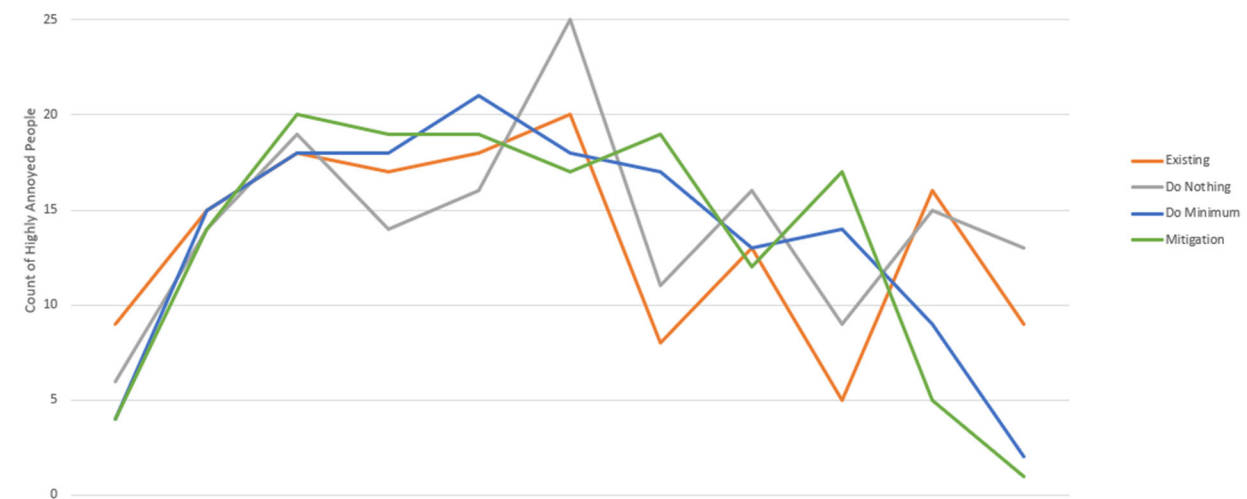
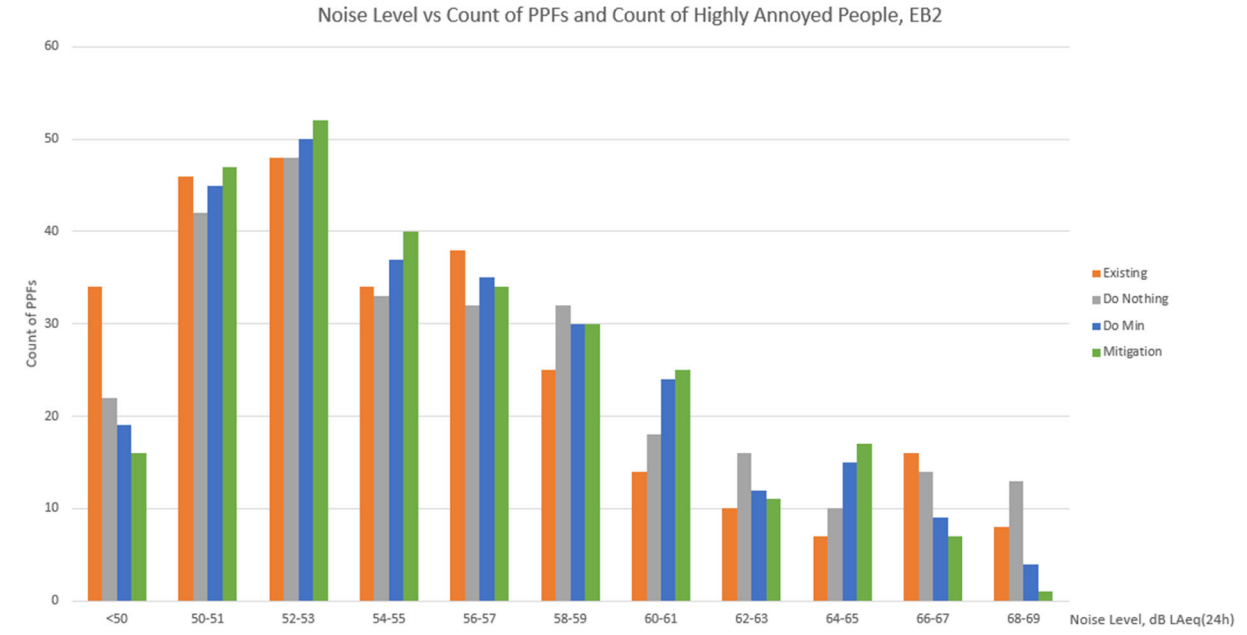
Using the regression equation above and the population estimations, the count of people potentially highly annoyed per 2 dB band from 50 dB L_{Aeq} to 70 dB L_{Aeq} has been estimated for the noise modelling scenarios. The results are summarised in the table and figure below.

¹ WHO Environmental Noise Guidelines for European Region (2018)

<http://www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018>

² Basner M, McGuire S. WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep. Int J Environ Res Public Health. 2018 Mar 14;15(3):519. doi: 10.3390/ijerph15030519. PMID: 29538344; PMCID: PMC5877064.

³ <https://www.stats.govt.nz/information-releases/statistical-area-1-dataset-for-2018-census-updated-march-2020>



Noise level vs count of PPFs and potentially highly annoyed people

Count of potentially highly annoyed people per scenario:

Existing	Do Nothing	Do Minimum	Mitigation
148	158	149	147

The results in the table show that with implementation of the Mitigation scenario, the number of potentially highly annoyed people will decrease by 11 compared to the Do Nothing scenario (future year without EB2 built). The figure shows that there is a redistribution of the number of potentially highly annoyed people when comparing the Mitigation scenario to the other scenarios, particularly in the 64-69 dB range.

Even though annoyance from road traffic noise will remain mostly unchanged when EB2 is considered as a whole, adverse noise effects at individual receivers must still be considered when assessing noise effects as a whole from EB3R.

The WHO guidelines summary recommendations recommend that noise levels should be reduced below 50 dB $L_{Aeq(24h)}$. They recommend that “policy-makers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values... [by] reducing noise at both the source and on the route between the source and the affected population by changes in infrastructure”.

Noise at the source has already been covered off by implementation of a low noise road surface, asphaltic concrete AC-14, across EB2. Noise barriers (to block noise on the route between the source and affected populations), are recommended across EB2 where they will be effective, in line with the NZS 6806 requirements. Noise barriers would be ineffective across a large number of PPFs as their performance would be compromised due to the large gaps needed for driveways.

There is a limit to the level of mitigation that can be applied to operational (road traffic) noise within the designation. Whilst EB2 will be installing low noise road surfaces and barriers, noise levels at a number of receivers will be above the WHO guidance due to their proximity to the existing road locations, which is an existing situation.

Question 54

Request satisfied.

No further response required.

Question 55

Request satisfied.

No further response required.

21 FEBRUARY 2023

NOISE AND VIBRATION RESPONSE – EB3R

Eastern Busway Alliance
20 Viaduct Harbour Avenue, Auckland 1010
Private Bag 92250, Auckland 1142, New Zealand
Email info@easternbusway.nz



21 February 2022

Auckland Council
Private Bag 92300
Victoria Street West
Auckland 1142

Attention: Warwick Pascoe - Principal Project Lead, Auckland Council

Dear Warwick

Re. Response to Council further information – EB3R Application Package

I am writing in regard to Auckland Council's (the Council) further information request in respect noise and vibration in EB3R, in respect to World Health Organisation (WHO) guidelines. A technical response in relation to this matter is attached to this letter.

The attached response addresses the Mr. Styles' queries, and we consider that all outstanding noise/vibration matters related to EB3R have been addressed.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'M. Zame', with a long horizontal flourish extending to the right.

Matt Zame
Eastern Busway Alliance Director

Attachment 1 – EB3R Noise and Vibration Response

Date	20 February 2023
To	Auckland Council
From	Shivam Jakhu
Subject	EB3R S92 response – Acoustics

Hi Sonja,

I am writing this letter to address the matters raised by Auckland Council regarding our responses to their S92 request.

Please note that a reproduction of the assessment of effects section from the road traffic noise assessment report is provided in the attached memo. This text has been amended to reflect changes to the assessment of effects following the S92 request.

Question 45:

Auckland Council response: Request partly satisfied. Two tables have been produced in the response where only one is required. Having to move between two tables makes it harder to understand the effects, in the context of reports that are already very lengthy. The revised / new tables need to be incorporated into the original reports, ideally as an update to the original Table 12 as suggested. The request also suggested that the same receiver-count could be done for vibration effects, but this has not been responded to. Updating the original report to add receiver counts to tables 12 and 13 would satisfy the request.

In order to make the response to this question clearer, one table covering noise effects is provided below.

We have chosen not to produce a table of effects and counts of affected receivers per level for vibration since we consider this could be potentially misleading – vibration predictions are generally for worst-case levels only, and these levels would usually only happen at a given receiver intermittently. Also, vibration levels measured on site always tend to be lower than those predicted. We have therefore only provided the distances at which exceedances of the vibration criteria could potentially occur to reflect the high-level nature of the vibration assessment.

<i>External Noise Level, dB L_{Aeq}</i>	<i>Approximate Corresponding Internal Noise Level, dB L_{Aeq}</i>	<i>Potential daytime effects, outdoors</i>	<i>Potential daytime effects, indoors</i>	<i>Count of receivers affected during worst case scenario (concrete saw, 30% on-time, with mitigation)</i>	<i>Count of receivers affected during typical scenario (excavator, with mitigation)</i>
65 - 70	45 - 50	People would not want to spend any length of time outside, except when unavoidable through workplace requirements	Noise levels would be noticeable but unlikely to interfere with residential or office daily activities.	0	23

External Noise Level, dB L_{Aeq}	Approximate Corresponding Internal Noise Level, dB L_{Aeq}	Potential daytime effects, outdoors	Potential daytime effects, indoors	Count of receivers affected during worst case scenario (concrete saw, 30% on-time, with mitigation)	Count of receivers affected during typical scenario (excavator, with mitigation)
70 - 75	50 - 55	Businesses that involve substantial outdoor use would experience considerable disruption.	Concentration would start to be affected. TV and telephone conversations would begin to be affected.	33	28
75 - 80	55 - 60	Some people may choose protection for long periods of exposure. Conversation would be very difficult, even with raised voices.	Phone conversations would become difficult. Personal conversations would need slightly raised voices. Office work can generally continue, but 55 dB is considered by the experts to be a tipping point for offices. For residential activity, TV and radio sound levels would need to be raised.	28	13
80 - 85	60 - 65	Hearing protection would be required for prolonged exposure (8 hours at 85 dB) to prevent hearing loss.	Continuing office work would be extremely difficult and become unproductive. In a residential context, people would actively seek respite.	3	2
85 - 90	65 - 70	People would not want to spend any length of time outside, except when unavoidable through workplace requirements	Untenable for both office and residential environments. Unlikely to be tolerated for any extent of time.	8	6

Question 46

Request partly satisfied. This response provides helpful insight into the very approximate durations that groups of receivers are expected to be exposed to noise and vibration levels greater than the project standards. I think it would be helpful for the response to be reformatted and categorised into the three durations set out in the request in a clear and succinct manner - i.e.:

- a) Receivers exposed to noise levels above the Project Standards for up to 1 week – Dwellings screened from the works by at least one other dwelling, etc*
- b) Receivers exposed to noise levels above the Project Standards for 1 week to 4 weeks – Dwellings near to etc*

This could be done when integrated into the original report.

The response has been re-formatted into a table as requested below. Please note that vibration measurements on site always tend to be lower than those predicted, and the table below is based on predictions.

Relative position of receiver to EB3R works	Approximate duration of exposure to noise above the daytime 70 dB L_{Aeq} noise criterion for the total duration of the works	Approximate duration of exposure to vibration levels above the daytime Category A 2 mm/s PPV criteria for the total duration of the works	Approximate duration of exposure to vibration levels above the daytime Category B criteria for the total duration of the works
Directly facing construction works that will progress linearly	Cumulative total of 1-4 weeks	Cumulative total of 1-4 weeks	Cumulative total up to 1 week
Set back one row of houses from works that will progress linearly	Cumulative total up to 1 week	Cumulative total up to 1 week	No exceedances

Question 47:

Request satisfied. The response could very usefully be integrated into the original report under the assessment of effects section. The description of effects could be separated for each receiver with sub-headings as appropriate.

No further response required.

Question 48

Request partly satisfied. Neither 47, 48 or 49 make it explicit that there is likely to be significant adverse effects. Integration with the original report and the response to request 47 would be helpful, as would be clear acknowledgement that the effects will be significant, even with mitigation. It may be possible to reduce the effects so they are not significant, but this will be dependent on the practicability of mitigation itself. Because we don't know yet if the mitigation will be practicable to implement, the response / revised report should make it clear that the effects may be significant at the specified receivers.

If the mitigation measures set out in our response to the S92 request are not followed, noise effects potentially could be significant. However, if the mitigation measures are followed, noise will be kept to levels that are compliant with the relevant criteria for the majority of the works, therefore we consider that noise effects will not be significant.

If the mitigation and management measures set out in the CNVMP are implemented, it is unlikely that the Category B vibration criteria will be exceeded at any buildings, therefore we consider that vibration effects will not be significant.

Question 49

Request partly satisfied. The response does not provide a clear objective or likely outcome that the mitigation is designed to achieve – it simply refers to vibration being 'managed'. Does this mean it will be managed so that the effects / disruption will not be significant (e.g. mostly tolerable) or will the nature of the works be such that disruption will be likely for more than short periods to the extent that

the business may not be able to trade normally? The first bullet point seems to make it unequivocal that the works will be managed around the sensitivity receiver in all cases. If this is the case, please confirm. If the works will not always be able to be managed around the sensitivity of the receiver, what will the effect be?

We consider that vibration effects at the Pakuranga Medical Centre will not be significant.

Question 50

Request satisfied.

No further response required.

Question 51

Request partly satisfied. The response confirms that the noise models have been adjusted to reflect the different speed environments appropriately. However, the updated data is shown only in lengthy tables by-receiver as an appendix to the response. The categorisation and summaries of this data is an important factor in the overall assessment of noise effects. Such summaries of the original data can be found in the original assessment in many places. For example, table 6-1, the text in section 6.1, right through section 6.2, very significantly at Figures 7 and 8 and the accompanying text, much of section 6.3 and numerous individual statements throughout the report including in the conclusions. The revised predictions need to be integrated into the original noise report and all consequential changes made. The Appendices showing the noise level predictions and categorisation of PPFS also need updating. This is critical to allow the submitters and decision makers to understand the effects.

A clear re-production of the assessment of effects section from the road traffic noise assessment report is provided in the attached memo. This text has been amended to reflect changes to the assessment of effects following the S92 request.

Question 52

The additional assessment of diesel bus noise is helpful, but the assessment appears to be limited to diesel buses idling only, and using an LAeq descriptor with no reference time interval stated. Can the assessment be updated (and integrated into the original report) in a way that addresses the noise of diesel buses idling and accelerating away, and using a descriptor and reference time interval that adequately describes the effects that will be experienced by the closest receivers. This may involve a short reference time period, particularly for buses in use at night time.

The noise level prediction for buses idling will remain the same regardless of the time descriptor used, since the calculation assumed that the bus would be idling continuously.

An additional calculation for buses pulling away has been carried out. Based on data measured by AECOM, the instantaneous sound power level of a bus pulling away is approximately 100 dB L_{WA}. This would correspond to a noise level of 64 dB L_{Aeq} at the façade of 2/2 Chevis Place (the closest PPF to a bus stop, approximately 25m away). This is slightly above the measured ambient noise in the area

during the night-time period and is below the measured ambient noise in the area during the daytime period.

However, the noise level prediction of 64 dB L_{Aeq} assumes a continuous noise source. In reality, the maximum noise level from a bus pulling away will only last for a few seconds before dropping rapidly as the noise source moves away from a given receiver. Therefore, a conservative estimate of the actual noise level measured over a shorter reference time period, for example $L_{Aeq(10\text{ seconds})}$, would be 59 dB $L_{Aeq(10\text{ seconds})}$, which is similar to the existing ambient noise level in the area.

We therefore consider that noise from diesel buses pulling away at bus stops will not appreciably change the existing ambient night-time noise environment near the bus stop, therefore noise effects from diesel buses pulling away will be negligible.

Question 53

Request not satisfied. The response does not address the request adequately. The request seeks a “meaningful and sufficiently detailed assessment of the noise effects that refers to, and explains the effects of the project against, the objectives of the World Health Organisation Environmental Noise Guidelines for the European Region (2018) and the specific recommendations for road traffic noise. This should include any statistical analysis to demonstrate how the predicted noise levels compared to the recommendations.”

The response only focusses on the number of PPFs that are exposed to more than or less than 50dB $L_{Aeq(24hr)}$. The response includes maps that show the noise levels from 50dB $L_{Aeq(24hrs)}$ upwards. The response does not contain any explanation of the effects, any assessment against the objectives and recommendations of the WHO guidance, or any meaningful and sufficiently detailed assessment of the noise effects.

For context, the summary recommendations for road traffic noise are:

- For average noise exposure, the GDG strongly recommends reducing noise levels produced by road traffic below 53 dB L_{den} , as road traffic noise above this level is associated with adverse health effects.*
- For night noise exposure, the GDG strongly recommends reducing noise levels produced by road traffic during night time below 45 dB L_{night} , as road traffic noise above this level is associated with adverse effects on sleep.*
- To reduce health effects, the GDG strongly recommends that policy-makers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions, the GDG recommends reducing noise both at the source and on the route between the source and the affected population by changes in infrastructure.*

The response needs to be expanded considerably to address the request and to address the recommendations of the WHO guidance. The full response should be integrated into the main report.

The conversion from L_{den} should be taken from locally sourced data contained in Appendix C to the original report. This is an easy calculation and will provide a more relevant and accurate conversion between the WHO guidance and the descriptors used in NZS6806. L_{night} can be determined from the locally measured data.

Research undertaken by the WHO¹ has identified that long-term exposure to noise levels above 50 dB L_{Aeq} can have negative impacts on physical and mental health and wellbeing. High noise levels can lead to annoyance, lack of concentration and sleep disturbance, which in turn can cause other health issues.

We have been liaising with the Council peer reviewer across other AT projects about our approach on addressing health effects from road traffic noise. The approach set out below is consistent with that undertaken on other projects.

The WHO guidelines state that there is evidence indicating that annoyance may be a cause of cardiovascular and metabolic diseases. The WHO guidelines provide a method to calculate an estimation of the percentage of people potentially highly annoyed based on noise levels incident at the façades of dwellings. The relationship is based on a regression equation derived from a systematic review of studies relating road traffic noise and annoyance.

Adopting the regression equation, the count of potentially highly annoyed people can be calculated as follows:

- Count of people potentially highly annoyed = (1) * (2), where
 - (1) = population (count) exposed to specific dB $L_{Aeq(24h)}$ noise level
 - (2) = $78.9270 - 3.1162 \times (L_{Aeq(24h)}+3) + 0.0342 \times (L_{Aeq(24h)}+3)^2$ (exposure-response function)²

Population estimations per dwelling were derived from information available from Statistics New Zealand³.

Using the regression equation above and the population estimations, the count of people potentially highly annoyed per 2 dB band from 50 dB L_{Aeq} to 70 dB L_{Aeq} has been estimated for the noise modelling scenarios. The results are summarised in the table and figure below.

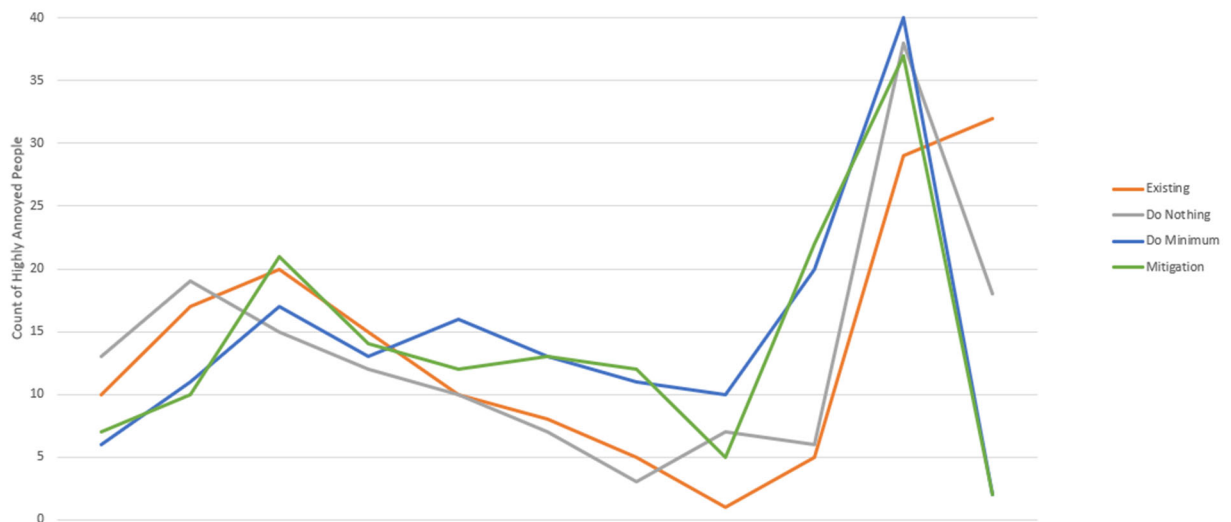
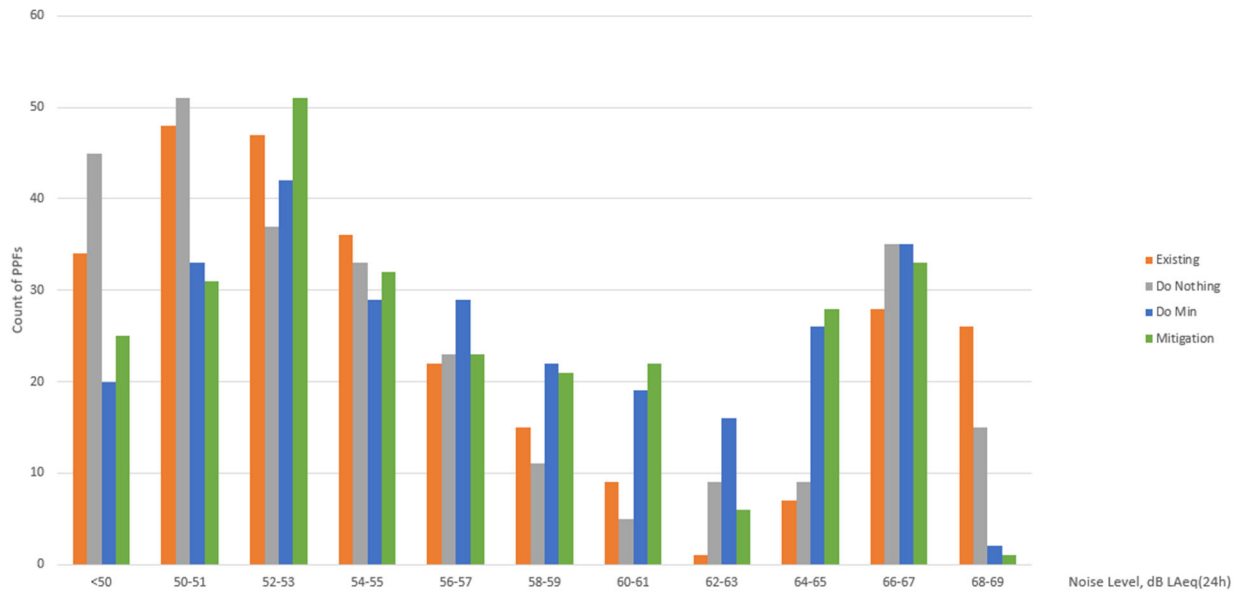
¹ WHO Environmental Noise Guidelines for European Region (2018)

<http://www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018>

² Basner M, McGuire S. WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep. *Int J Environ Res Public Health*. 2018 Mar 14;15(3):519. doi: 10.3390/ijerph15030519. PMID: 29538344; PMCID: PMC5877064.

³ <https://www.stats.govt.nz/information-releases/statistical-area-1-dataset-for-2018-census-updated-march-2020>

Noise Level vs Count of PPFs and Count of Highly Annoyed People, EB3R



Noise level vs count of PPFs and potentially highly annoyed people

Count of potentially highly annoyed people per scenario:

Existing	Do Nothing	Do Minimum	Mitigation
152	148	159	155

The results in the table show that with implementation of the Mitigation scenario, the number of potentially highly annoyed people will only increase by 7 compared to the Do Nothing scenario (future year without EB3R built). The figure shows that there is a peak in the number of people potentially highly annoyed around the 66-67 dB band, with a number of PPFs concentrated in this band.

Even though annoyance from road traffic noise will remain mostly unchanged when EB3R is considered as a whole, adverse noise effects at individual receivers must still be considered when assessing noise effects as a whole from EB3R.

The WHO guidelines summary recommendations recommend that noise levels should be reduced below 50 dB $L_{Aeq(24h)}$. They recommend that “policy-makers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values... [by] reducing noise at both the source and on the route between the source and the affected population by changes in infrastructure”.

Noise at the source has already been covered off by implementation of a low noise road surface, asphaltic concrete AC-14, across EB3R. Noise barriers (to block noise on the route between the source and affected populations), are recommended across EB3R where they will be effective, in line with the NZS 6806 requirements. Noise barriers would be ineffective across a large number of PPFs as their performance would be compromised due to the large gaps needed for driveways.

There is a limit to the level of mitigation that can be applied to operational (road traffic) noise within the designation. Whilst EB3R will be installing low noise road surfaces and barriers, noise levels at a number of receivers will be above the WHO guidance due to their proximity to the existing road locations, which is an existing situation.

Question 54

Request satisfied.

No further response required.

Question 55

Request satisfied.

No further response required.