

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

Date: **Week One: Tuesday 6 - Friday 9 October 2020**
Week Two: Monday 12 - Thursday 15 October 2020

Time: **9.30am**
Meeting Room: **Main Hall**
Venue: **Warkworth Masonic Hall,
3 Baxter Street, Warkworth**

HEARING REPORT

VOLUME ONE – RESOURCE CONSENT

**MULTIPLE SITES BETWEEN WARKWORTH AND
NORTH OF TE HANA**

**WAKA KOTAHI - THE NEW ZEALAND
TRANSPORT AGENCY**

COMMISSIONERS

Chairperson **Kitt Littlejohn**
Commissioners **Kim Hardy**
Juliane Chetham
Nigel Mark-Brown

Paulette Kenihan
SENIOR HEARINGS ADVISOR

Telephone: 09 890 8148 or 021 706 729
Email: Paulette.kenihan@aucklandcouncil.govt.nz
Website: www.aucklandcouncil.govt.nz

WHAT HAPPENS AT A HEARING

At the start of the hearing, the Chairperson will introduce the hearing panel and council staff and will briefly outline the procedure. The Chairperson may then call upon the parties present to introduce themselves to the panel. The Chairperson is addressed as Mr Chairman or Madam Chair.

Any party intending to give written or spoken evidence in Māori or speak in sign language should advise the hearings advisor at least five working days before the hearing so that a qualified interpreter can be provided.

Catering is not provided at the hearing. Please note that the hearing may be audio recorded.

Scheduling submitters to be heard

A timetable will be prepared approximately one week before the hearing for all submitters who have returned their hearing attendance form. Please note that during the course of the hearing changing circumstances may mean the proposed timetable is delayed or brought forward. Submitters wishing to be heard are requested to ensure they are available to attend the hearing and present their evidence when required. The hearings advisor will advise submitters of any changes to the timetable at the earliest possible opportunity.

The hearing procedure

The usual hearing procedure is:

- The Requiring Authority (the applicant) will be called upon to present their case. The Requiring Authority may be represented by legal counsel or consultants and may call witnesses in support of the application. After the Requiring Authority has presented their case, members of the hearing panel may ask questions to clarify the information presented
- The relevant local board may wish to present comments. These comments do not constitute a submission however the Local Government Act allows the local board to make the interests and preferences of the people in its area known to the hearing panel. If present, the local board will speak between the applicant and any submitters.
- Submitters (for and against the application) are then called upon to speak. Submitters may also be represented by legal counsel or consultants and may call witnesses on their behalf. The hearing panel may then question each speaker. The council officer's report will identify any submissions received outside of the submission period. At the hearing, late submitters may be asked to address the panel on why their submission should be accepted. Late submitters can speak only if the hearing panel accepts the late submission
- Submitters wishing to present written information (evidence) in support of their applications or submissions should provide the number of copies indicated in the notification letter
- Only members of the hearing panel can ask questions about submissions or evidence. Attendees may suggest questions for the panel to ask but it does not have to ask them. No cross-examination - either by the applicant or by those who have lodged submissions – is permitted at the hearing
- After the Requiring Authority and submitters have presented their cases, the chairperson may call upon council officers to comment on any matters of fact or clarification
- When those who have lodged submissions and wish to be heard have completed their presentations, the Requiring Authority or their representative has the right to summarise the application and reply to matters raised by submitters. Hearing panel members may further question the Requiring Authority at this stage

- The chairperson then generally closes the hearing and the Requiring Authority, submitters and their representatives leave the room.
- The hearing panel will then deliberate “in committee” and make a decision on the resource consent application and a recommendation to the Requiring Authority on the Notice of Requirement. The Requiring Authority then has 30 working days to make a decision and inform council of that decision. You will be informed in writing of both decisions separately, the reasons for the decision and what your appeal rights are
- The decision on the resource consent component is usually available within 15 working days of the hearing closing.

Notice of Requirement and Resource Consent application
Multiple sites between Warkworth and north of Te Hana
Date: Week One: Tuesday 6 - Friday 9 October 2020
Week Two: Monday 12 - Thursday 15 October 2020

A NOTIFIED DISCRETIONARY RESOURCE CONSENT APPLICATION BY WAKA KOTAHI - THE NEW ZEALAND TRANSPORT AGENCY.

AND

A NOTIFIED NOTICE OF REQUIREMENT TO THE AUCKLAND COUNCIL UNITARY PLAN BY WAKA KOTAHI - THE NEW ZEALAND TRANSPORT AGENCY.

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Attachment 2	Section 92, Further information. Note: the further information has not been re-produced. View the material here; https://www.aucklandcouncil.govt.nz/ResourceConsentHearingDocuments/WW2W-s92-2020-10-06.pdf	-
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Attachment 6	Copies of decisions related to designation boundaries BUN60330590 and LUC60309679	215 – 306
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Nicola Holmes, Planner - Resource Consent

Reporting on a resource consent application to enable the construction, operation and maintenance for a new four lane state highway at Multiple sites between Warkworth and north of Te Hana. The reporting officer is recommending, subject to contrary or additional information being received at the hearing, that the application be **CONSENTED** to, subject to certain conditions.

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Attachment 2	Section 92, Further information - Note: the further information has not been re-produced. View the material here; https://www.aucklandcouncil.govt.nz/HearingDocuments/WW2/W-s92-2020-10-06.pdf	-
Attachment 3	Auckland Council specialist reviews for NoR	487 - 672
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Attachment 5	Qualifications and/or experience	673 - 678

Wayne Siu, Planner - Notice of Requirement

Reporting on a Notice of Requirement to enable the construction, operation and maintenance for a new four lane state highway at Multiple sites between Warkworth and north of Te Hana. The reporting officer is recommending that the notice of requirement be confirmed.

APPLICANT / REQUIRING AUTHORITY: Waka Kotahi - The New Zealand Transport Agency

Report on notified applications for resource consents under the Resource Management Act 1991 (RMA)



Discretionary activity

To: Independent Hearing Commissioners
From: Nicola Holmes, Principal Specialist - Planning
Hearing date: 6 October 2020

Note:

- This is not the decision on the applications.
- This report sets out the advice and recommendation of the reporting planner.
- This report has yet to be considered by the independent hearing commissioners delegated by Auckland Council to decide these resource consent applications.
- The decision will be made by the independent hearing commissioners only after they have considered the applications and heard from the applicant, submitters and council officers.

1. Application description

Application numbers: BUN60354951
LUC60354952 (Earthworks & vegetation removal)
WAT60354953 (Diversion of rivers & streams)
DIS60354954 (Diversion and discharge of stormwater runoff)
LUS60354955 (Streamworks)
WAT60356979 (Diversion of stormwater)
WAT60355184 (Diversion of groundwater)
LUC60355185 (Stormwater management)
DIS60355186 (Air Discharge)

Applicant: New Zealand Transport Agency

Site address: Multiple properties as detailed in the application in attachment 5.7.1.2.2 'Schedule of land directly affected by the resource consents'

Lodgement date: 20 March 2020

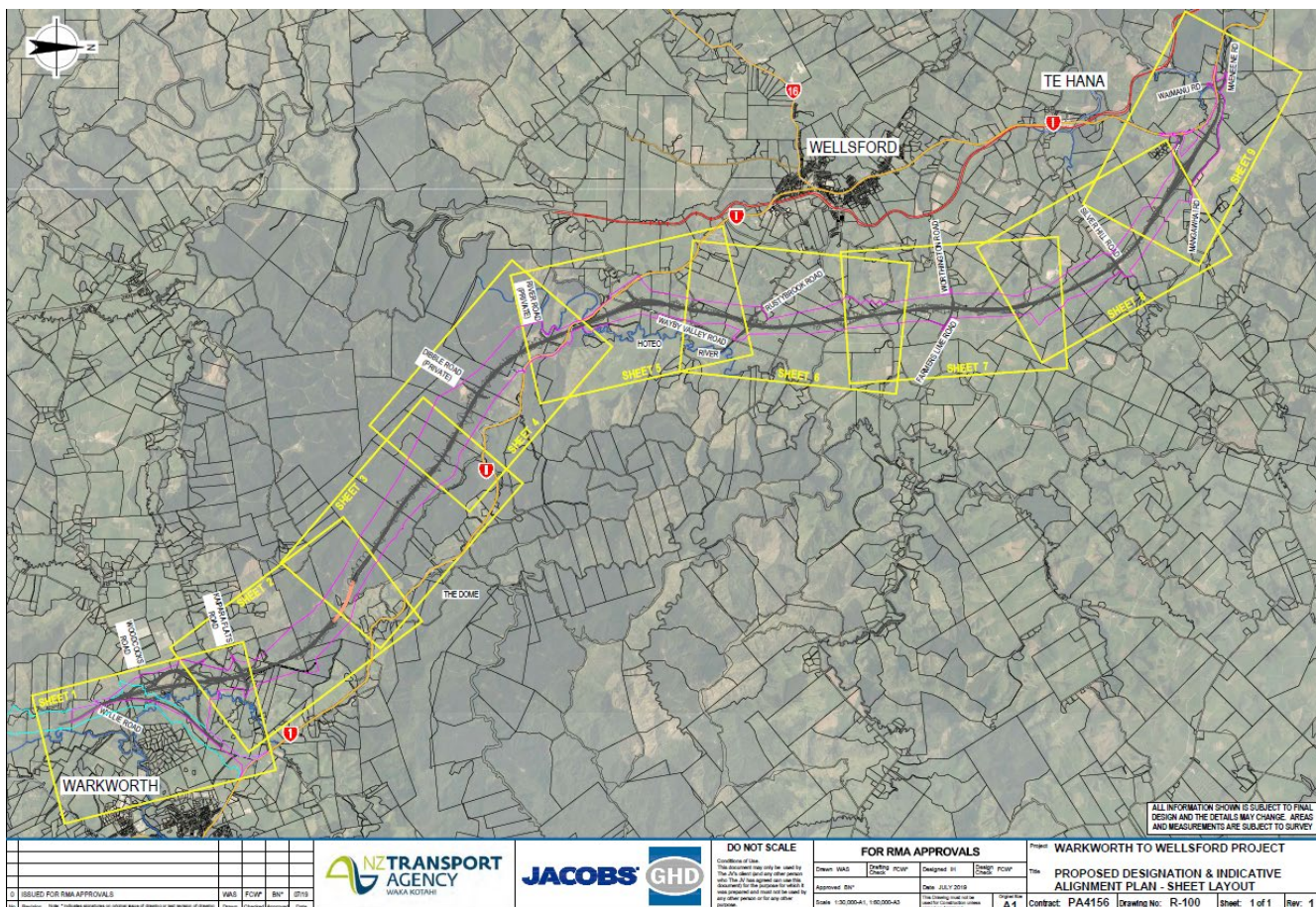
Notification date: 18 May 2020

Submission period ended: 29 June 2020

Number of submissions received: 26 in support

- 12 neutral
- 15 in opposition

2. Locality Plan



Source: Proposed Designation & Indicative Alignment Plan – Sheet Layout, Drawing No. R-100, Sheet 1 of 1, Rev. 1 (Attachment 36 of the application details)

3. Application documents

The list of application documents and drawings is set out in **attachment 1** of this report.

4. Adequacy of information

The information submitted by the applicant is sufficient to enable the consideration of the following matters on an informed basis:

- The nature and scope of the proposed activity that the applicant is seeking resource consents for.
- The extent and scale of the actual and potential effects on the environment (excluding freshwater ecology which is discussed further within this report).
- Those persons and / or customary rights holders who may be adversely affected.

- The requirements of the relevant legislation.

A request for further information under s92 of the RMA was made on 19/06/2020 and 17/07/2020. The applicant provided responses to the information requested in relation to resource consent matters on 29/07/2020 and 05/08/2020. The section 92 responses are detailed in **attachment 2** of this report.

5. Report and assessment methodology

The applications are appropriately detailed and comprehensive and include a number of expert assessments. Accordingly, no undue repetition of descriptions or assessments from the applications is made in this report.

I have made a separate and independent assessment of the proposal, with the review of technical aspects by independent experts engaged by the council, as needed.

Where there is agreement on any descriptions or assessments in the application material, this is identified in this report.

Where professional opinions differ, or extra assessment and / or consideration is needed for any reason, the relevant points of difference of approach, assessment, or conclusions are detailed. Also – the implications for any professional difference in findings in the overall recommendation is provided.

The assessment in this report also relies on reviews and advice from the following specialists:

- Kala Sivaguru - Senior Specialist (Coastal)
- Matthew Byrne - Earthworks, Streamworks & Sediment Management Consultant
- Mark Lowe - Principal Environmental Scientist (Freshwater Ecology)
- Paul Crimmins – Senior Specialist - Contamination, Air & Noise
- Abhilasha Sharma – Senior Specialist – Stormwater & Industrial and Trade Activities
- Trent Sunich – Senior Planning and Policy Consultant on behalf of Healthy Waters
- Sian France – Technical Director - Hydrogeology

These assessments are included in **attachment 3** of this report.

A table of qualifications and/or experience for myself and the persons above can be found in **attachment 4** of this report.

This report is prepared by:

Nicola Holmes, Principal Specialist - Planning,
Resource Consents

Signed:



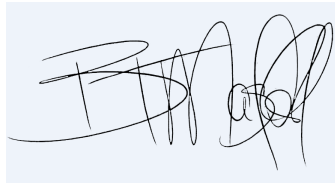
Date:

Date: 27 August 2020

This report is reviewed by:

Blair Masefield, Project Manager - Premium,
Resource Consents

Signed:



Date:

.....
Date: 27 August 2020

Reviewed and approved for release by:

Dan Rodie, Principal Specialist – Planning,
Resource Consents

Signed:



Date:

.....
Date: 27 August 2020

6. Executive summary

The New Zealand Transport Agency has applied to the council for resource consents in relation to the construction and operation of a new four lane state highway between Warkworth and Te Hana. This application is being processed concurrently with a notice of requirement and relates to the regional consent triggers associated with the construction and ongoing operation of the highway. An assessment against the matters to be considered in relation to a notice of requirement is being undertaken by Mr Wayne Siu and will be commented on within his section 42A report.

In summary regional consents are required for the earthworks, vegetation removal, works within and to alter watercourses (streams and wetlands), dewatering of groundwater levels, and stormwater and air discharge. The applications have been processed in a bundled manner and overall considered as a discretionary activity.

The application was notified on the 18th May 2020 for an extended period of six weeks (submission period ending 29th June 2020) to take into account disruption to daily life caused by the Covid-19 pandemic and ensuring people were not unduly prevented from participating in the notification process and were able to lodge a submission.

A total of 53 submissions were received in response to the notification of the resource consent application, including 26 submissions in support, 12 neutral submissions and 15 submissions in opposition. Of those submissions in support a number of comments were received in regards to timing of the project and seeking the highway to be constructed sooner rather than later; the neutral submissions notably contained suggestions to include conditions to address specific concerns raised in submissions; and the submissions in opposition raised concerns relating broadly to construction, operational, ecological and landscape effects.

Overall, it is considered generally that the applicant has sufficiently demonstrated that the effects on the environment can be suitably managed and it is recommended that consent is granted. However, with respect to freshwater ecology effects, the Council's specialist does not consider sufficient details have been provided at this point in time to conclude the management of effects is appropriate, particularly regarding ecological offsetting. I am comfortable this matter can be suitably addressed via conditions, as recommended, to ensure that the level of offsetting provided at the time of construction occurring and based upon the detailed design, will be sufficient and commensurate with the level of offsetting required for the project.

7. The proposal, site and locality description

Karyn Sinclair of the 'Jacobs GHD Joint Venture' has provided a description of the proposal and subject site on pages 26-86 of the Assessment of Environmental Effects (AEE) titled: Assessment of Effects on the Environment: Warkworth to Wellsford Project, dated March 2020 (herein after referred to as the 'AEE').

Having undertaken a site visit on 8th July 2020, I concur with that description of the proposal and the site and have no further comment.

8. Background

The background to the project is outlined within section 2 of the AEE, pages 9 – 25. Whilst I have not been involved in the project for an extensive period of time, Mr Masfield who reviewed this report has been project managing engagement with council and its specialists since 2018.

9. Reasons for the applications

Resource consents are required for the following reasons:

Land use consent (s9) – LUC60354952 & LUC60355185

Auckland Unitary Plan (Operative in part)

E26 Infrastructure (LUC60354952)

- To create stormwater detention/retention ponds and wetlands associated with the project as a controlled activity under rule E26.2.3.1 (A55).
- The removal and alteration of vegetation that does not comply with standards E26.3.5.1 to E26.3.5.4 as a restricted discretionary activity under rule E26.3.3.1 (A77).
- Earthworks activity greater than 50,000m² where land has a slope less than 10 degrees outside the Sediment Control Protection Area as a restricted discretionary activity under rule E26.5.3.2 (A103).
- Earthworks activity greater than 2,500m² where the land has a slope equal to or greater than 10 degrees as a restricted discretionary activity under rule E26.5.3.2 (A106).
- Earthworks activity greater than 2,500m² within the Sediment Control Protection Area as a restricted discretionary activity under rule E26.5.3.2 (A107).
- Earthworks activity between 10m² - 2500m² and from 5m³ - 2500m³ within an SEA as a restricted discretionary activity under rule E26.6.3.1 (A117).
- Earthworks activity greater than 2500m² or 2500m³ within a SEA as a discretionary activity under rule E26.6.3.1 (A118).

Note: As noted above consent is required for the removal and alteration of vegetation under E26.3.3.1 (A77) and although this is a regional matter it is being considered as part of the NOR process, and in particular by Mr Rossak in his technical memo addressing terrestrial ecology effects. This approach was taken given the interconnected relationship between vegetation removal under both regional and district rules and the overall terrestrial ecology effects.

*E9 Stormwater quality – High contaminant generating car parks and high use roads
(LUC60355185)*

- Development of a new or redevelopment of an existing high use road greater than 5000m² as a controlled activity under Rule E9.4.1 (A7).

Streamworks consent (s13 & 14) – LUS60354955 & WAT60354953

Auckland Unitary Plan (Operative in part)

E3 Lakes, rivers, streams and wetlands

- Diversion of a stream with associated disturbance and sediment discharge outside of any overlays as a discretionary activity under rule E3.4.1 (A19).
- Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific standards in E3.6.1.10 – E3.6.1.13 (outside overlays) as a discretionary activity under rule E3.4.1 (A26).
- Temporary structures that comply with the standards within E3.6.1.15 within overlays, as a discretionary activity under E3.4.1 (A27).
- Bridges or pipe bridges within overlays that comply with the standards in E3.6.1.16 as a discretionary activity under rule E3.4.1 (A29).
- Culverts more than 30m in length when measured parallel to the direction of water flow outside of any overlay as a discretionary activity under rule E3.4.1 (A33).
- Erosion control structures within an overlay that is less than 30m in length when measured parallel to the direction of water flow and complies with the standards in E3.6.1.14 as a discretionary activity under rule E3.4.1 (A34).
- Stormwater outfalls within an overlay that comply with the standards in E3.6.1.14 as a discretionary activity under rule E3.4.1 (A39).
- Activities outside of any overlay 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 as a discretionary activity under rule E3.4.1 (A44).

Water Permit (s14) – WAT60355184 & WAT60356979

Auckland Unitary Plan (Operative in part)

E7 Taking, using, damming and diversion of water and drilling (WAT60355184)

- Dewatering and groundwater level control for the long-term operation of the road cuts, not complying with standards E7.6.1.6(2) and (3) as a restricted discretionary activity under rule E7.4.1 (A20).
- Excavations for the road alignment will exceed 1ha in total area and 6m depth below natural ground level and the diversion cannot comply with standard E7.6.1.10(2), requiring consent as a restricted discretionary activity under rule E7.4.1 (A26).

E8 Stormwater – Discharge and diversion (WAT60356979)

- Diversion of stormwater runoff from new impervious surface areas which exceeds 5000m² and which does not comply with standards E8.6.1 and E8.6.4.1 as a discretionary activity under Rule E8.4.1 (A10).

Discharge Permit (s15) – DIS60354954 & DIS603551896

Auckland Unitary Plan (Operative in part)

E8 Stormwater – Discharge and diversion (DIS60354954)

- Discharge of stormwater runoff from new impervious surface areas which exceeds 5000m² and which does not comply with standards E8.6.1 and E8.6.4.1 as a discretionary activity under Rule E8.4.1 (A10).

E14 Air Quality (DIS603551896)

- Temporary crushing of aggregates greater than 60 tonnes per hour where the activity complies with permitted standards in E14.6.1.13, as a restricted discretionary activity under rule E14.4.1 (A94).

The Council's Air Quality specialist, Mr Paul Crimmins, within his technical memo has referred to rule E14.4.1 (A83) as a reason for consent as, based on his experience, earthworks of the scale proposed are unlikely to comply with the permitted standards in E14.6.1.1. The applicant, however, is not seeking consent under this rule as they consider that they can undertake the earthworks in accordance with the permitted standards in E14.6.1.1.

The reasons for consent are considered together as a discretionary activity overall.

10. Status of the resource consents

Where a proposal:

- consists of more than one activity specified in the plan(s); and
- involves more than one type of resource consent or requires more than one resource consent; and
- the effects of the activities overlap;

the activities may be considered together.

Where different activities within a proposal have effects which do not overlap, the activities will be considered separately.

In the instance, the effects of the proposed resource consents will overlap and thus they are considered together as a discretionary activity overall.

11. Notification and submissions

Notification background

The applications were publicly notified on 18 May 2020 at the request of the applicant.

Notice of the applications was served on 18 May 2020 on those persons / customary or marine title groups identified as being adversely affected by the proposal.

Submissions

When the submission period ended, a total of 53 submissions were received, with no late submissions received.

Of the submissions received:

26 in support

12 neutral

15 opposing

A summary of the issues raised in submissions together with the relief sought by the submitters is set out below.

This table is only a summary of the key issues raised in submissions. For the specific details, refer to the full set of submissions, included in **attachment 5** to this report.

This summary of submissions identifies the following:

- the issues raised in submissions in terms of the key issues below
- details any relief sought by the submitter
- whether a submitter wishes to be heard at the hearing.

Summary of submissions

Issues raised:		
1.	Road toll	1
2.	Economic benefits	9
3.	Safety and traffic congestion concerns with the current state highway	5
4.	Construction related effects	8
5.	Operational amenity effects	10
6.	Timeframe for construction to commence	2
7.	Size of the Warkworth interchange	3
8.	Flooding	5
9.	Concerns with the traffic analysis undertaken	2

Issues raised:		
10	Landscape effects	3
11	Ecological effects	8
12	Effects on the ongoing operation and maintenance of infrastructure	3
13	Northern ending point of the proposed alignment	3
14	Continuation of rural activities to be enabled/reverse sensitivity	3
15	Pedestrian and cycle connectivity	2
16	Cultural effects	1

Column 1 is the number for the issue raised, middle explains the issue, last column is for the number of submitters that raised that issue.

Relief sought:		
A.	Grant consent	21
B.	Revision to conditions	19
C.	Compensation	5
D.	Refuse consent	5
E.	Certainty around alignment and design	3
F.	Community group involvement	3

Late submissions

There were no late submissions received in relation to the resource consent applications.

Written Approvals

The applicant has not obtained the written approval from any persons.

Consideration of the applications

12. Statutory considerations

Resource Management Act 1991

In considering any application for resource consent and any submissions received, the council must have regard to the following requirements under s104(1) of the RMA – which are subject to Part 2 (the purpose and principles):

- any actual and potential effects on the environment of allowing the activity;
- any measure proposed to or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any

adverse effects on the environment that will or may result from allowing the activity;

- any relevant provisions of national policy statements, New Zealand coastal policy statement; a regional policy statement or proposed regional policy statement; a plan or proposed plan, a national environmental standard (NES), or any other regulations; and
- any other matter the council considers relevant and reasonably necessary to determine the application.

When considering any actual or potential effects, the council may disregard any adverse effects that arise from permitted activities in a NES or a plan (the permitted baseline). The council has discretion whether to apply this permitted baseline.

For a discretionary activity, the council may grant or refuse consent (under s104B). If it grants the application, it may impose conditions under s108.

Sections 105 and 107 address certain matters (in addition to the matters in s104(1)), relating to discharge permits and coastal permits where the proposal would otherwise contravene s15 (or ss15A or 15B).

Sections 108 and 108AA provide for consent to be granted subject to conditions and sets out the kind of conditions that may be imposed.

13. Actual and potential effects on the environment

Sections 104(1)(a) and 104(1)(ab) of the RMA requires the council to have regard to:

- any actual and potential effects on the environment of allowing the activities (including both the positive and the adverse effects); and
- any measure proposed to or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.

Positive effects

The proposal will have the following positive effects:

- Facilitate the construction and ongoing operation of an improved state highway network between Warkworth and Wellsford which provides for safer and more efficient travel.
- Potential economic growth in the Northland region due to improved and efficient roading connections.

Adverse effects

In considering the adverse effects of the proposal, the council:

- may disregard those effects where the plan permits an activity with that effect; and
- must disregard those effects on a person who has provided written approval, and trade competition or the effects of trade competition.

Effects that must be disregarded

Any effect on a person who has given written approval to the applications

As aforementioned, no written approval has been provided with the applications.

Trade competition

Given the nature of the application, in relation to the construction of a new State Highway 1 (SH1) between Warkworth and Te Hana, trade competition is not a relevant consideration.

Effects that may be disregarded

Permitted baseline assessment

The permitted baseline refers to permitted activities on the subject site. The permitted baseline may be taken into account and the council has the discretion to disregard those effects where an activity is not fanciful. In this case the permitted baseline is not considered to be useful tool when assessing the effects of the proposal as the type and or complexity of effects associated with the proposed activity are such that the permitted baseline does not provide a useful comparison for the purpose of discounting effects.

Assessment

Receiving environment

The receiving environment beyond the subject site includes permitted activities under the relevant plans, lawfully established activities (via existing use rights or resource consent), and any unimplemented resource consents that are likely to be implemented. The effects of any unimplemented consents on the subject site that are likely to be implemented (and which are not being replaced by the current proposal) also form part of this reasonably foreseeable receiving environment. This is the environment within which the adverse effects of these applications must be assessed.

The AEE in section 3 'Description of the existing environment' provides a useful description of the receiving environment although it does not go into any detail in relation to any unimplemented consents.

Unfortunately, the Council's database does not enable a thorough and robust search of any resource consents granted within the designation boundaries. However, I am aware of two resource consents that have been granted, as mentioned in submissions (submitters JS4 and RC28). A summary of these consents can be found below, and copies of the decisions are included in **attachment 6**.

- BUN60330590 – consent granted for the construction and operation of an 8km wastewater conveyance pipeline (Watercare).
- LUC60309679 – earthworks consent granted to facilitate the construction of glasshouses at 476 Woodcocks Road (Southern Paprika).

Adverse effects

In addition to having regard to the above, in undertaking the following assessment I have:

- analysed the applications (including any proposed mitigation measures);
- visited the site and surrounds;
- reviewed the council's records;
- reviewed the submissions received; and
- taken advice from appropriate experts.

The following assessment addresses the adverse effects that have been identified. The ensuing section refers to various changes to recommended conditions. The specific wording of the conditions has not been referenced in this section but can be found in the set of the proposed conditions in **attachment 7**, with the amendments identified in **bold** or ~~strikethrough~~.

Land Contamination

The application was accompanied by a report entitled *WW2W Contaminated Land Assessment*, prepared by GHD and Jacobs, dated 16 February 2018 which identified some 'moderate risk'¹ activities within the designation boundaries. The report concluded that the activities were not widespread and unlikely to cause any significant soil contamination.

Although acknowledging that there is contaminated soil within the designation, as part of this process the applicant is not seeking any consents under the National Environmental Standard: Contaminated Soil or under E30 Contaminated Land of the AUP. Given the potential time lag between consents being obtained and construction works commencing, and the fact that no detailed design has been confirmed it is being proposed that any additional consents that may be required in regard to soil contamination will be sought at a later date.

Council's Land Contamination specialist, Mr Paul Crimmins has reviewed the aforementioned report and other relevant sections of the AEE (6.2.7, 9.1 and 11.2.6) and is satisfied that this approach is appropriate given that in the interim period additional activities which have the potential to contaminate land may occur and the final design layout may avoid any areas identified as 'moderate risk'.

I agree with this approach and do not consider land contamination issues to be a significant concern that consents need to be sought now. The following advice note is recommended to ensure that at the time of construction there is no confusion between the contractors and the Council's monitoring team that soil contamination related consents were not obtained as part of this application process.

Advice Note: Soil Contamination

Consents have not been granted regarding potential human health effects from contaminated soils under the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 or contaminant discharges under Chapter E30 of the Auckland Unitary Plan (Operative in Part), or any

¹ 'Moderate risk' activities as defined in the *Hazardous Activities and Industries List (HAIL, Ministry for the Environment, 2011)*

subsequent provisions. Depending on the final location and extent of earthworks and risks of soil contamination present, further investigation and consents may be required.

Air Quality

Air quality issues arise from construction dust effects and operational air quality effects arising from vehicles using the new highway when operational.

The applicant is proposing a 'Construction Air Quality Management Plan' (CAQMP) which includes dust mitigation measures. The application has been reviewed by Council's Air Quality specialist, Mr Paul Crimmins, and who has concluded that provided the following mitigation measures are adopted during construction, dust effects to human receptors or flora beyond the works area are unlikely to be offensive or objectionable:

- The use of water to suppress dust, particularly from vehicle accessways and the rock-crushing plant;
- Minimising the open area of excavations, and the use of stabilising;
- Separation of notably dusty activities from 'High Sensitivity Receptors' (HSRs) (including the rock crusher by >100 m);
- Routine monitoring for weather conditions conducive to dust nuisance and dust discharges to ascertain trigger levels for the need to increase mitigation measures ;
- Sealing access roads with frequent construction traffic and in close proximity to HSRs and maintaining these in a clean state;
- Restricting construction traffic to low speeds (<15 km/hr) on unsealed accessways.

Although consents are not triggered in relation to air discharge from the ongoing use of the highway upon completion, Mr Crimmins has considered a worst case scenario for ambient concentrations of particulate matter and nitrogen oxide arising from a given number of vehicles using the road and background air quality concentrations, in relation to the closest HSRs. On this matter Mr Crimmins concludes "*that regardless of where the highway alignment is placed within the proposed designation, operational air discharges (vehicle exhaust emissions from the highway and tunnel) are not likely to cause adverse air quality effects.*"

Overall, I do not consider that air quality will be adversely affected to any extent that will create a health concern to surrounding residents or adversely affect amenity values. Critical though is that dust management during the construction phase is undertaken on a rigorous basis and that there is a procedure in place for monitoring of this throughout the construction period.

Stormwater Management

Council's stormwater specialist, Ms Abby Sharma, has outlined the stormwater management for the operational phase of the project, including water quality and water quantity and summarises the stormwater approach as follows:

The stormwater from the proposed Project (total impervious area being 198.2ha) will be managed, collected, and conveyed by roadside drains, swales or underground pipes and treated via 34 offline wetlands prior to discharge into the receiving environment. Conveyance

of surface runoff from the modified local roads will be via either vegetated or rock lined swales prior to discharge into the existing streams. Cut-off drains are to be designed as either grassed or rock lined channels (on >5% steeper slopes with rock check dams) and to cater for the 100-year ARI rainfall event for the upstream catchment. The cut-off drains will be provided above cut sections and at the toe fill sections. Sediment traps are also proposed in drains at the base of rock cuttings for the capture of sediments generated from rock cuts. It is indicated that the stormwater reticulation at the road edge has not been designed as part of this phase of the project and will be assessed at the future detailed design stage, however, indicative stormwater reticulation has been included in order to inform the designation footprint required by the Project.

In terms of water quality, Ms Sharma concludes that the range of treatments proposed is in accordance with current best practice design guidelines and the receiving environment, being the Mahurangi Harbour via the Mahurangi River and the Kaipara Harbour, via the Hoteo and Oruawharo Rivers, will not result in a degradation of water quality as a result on the proposed motorway in its operational phase.

Hydrology mitigation is proposed through the use of the wetlands providing detention and retention for the 95th percentile rainfall event, and cut-off drains located above the cut sections and at the toe of fill sections which will be designed to cater for the 100 year ARI storm event for the upper catchment and discharged to existing streams/watercourses, or to new culverts. Overall, Ms Sharma considers the stormwater quantity management approach appropriate. However, she recommends that the conditions are amended to include a requirement for the peak flow controls for 2 and 10 year ARI storm events to be maintained at pre-development levels and implemented in the design details of the proposed wetlands. Given that the 'Operational Design Report' submitted with the application indicates that the wetlands would provide peak flow controls for the 2 and 10 year ARI storm events then I do not consider it onerous to reference it in the conditions of consent.

Ms Sharma has also recommended conditions on monitoring the water quality in the wetlands where fish passage is being provided to ensure that contaminant levels are not of a nature that will cause harm to the health of fish. In the event that fish do travel through the stormwater wetlands then I agree a condition requiring monitoring of contaminant levels in the wetlands is appropriate to minimise ecological effects.

An advice note is also recommended by Ms Sharma which states the following:

Design of the proposed stormwater management devices to be agreed upon prior to construction by NZTA and Auckland Transport. Written approval from Auckland Transport to be provided to Council upon approval.

Acknowledging that this is an advice note only, I have some reservations with its wording requiring third party approval (approval of Auckland Transport). I therefore suggest alternative wording:

The consent holder is advised that any stormwater management devices associated with local roads will be maintained by Auckland Transport and therefore it is advised that discussions are undertaken with Auckland Transport to enable agreement of a final design.

Overall, I concur with the conclusions made by Ms Sharma in terms of the level of stormwater related effects and that stormwater discharges to the receiving environment during the operational phase will be appropriate and will not adversely affect water quality and quantity to any extent considered greater than minor.

Flooding

As outlined within the technical memo prepared by Mr Trent Sunich on behalf of Healthy Waters three key locations along the alignment were identified as requiring further flood hazard modelling based on the Auckland Council's 'Rapid Flood Hazard Assessment' (RFHA). These key locations include the Mahurangi River and its tributaries crossings; Kourawhero Stream south of the proposed tunnel entry/exit portal; and Wayby Valley, the north branch of the Hotoe River. Each of these locations are discussed in more detail below. Healthy Waters has raised no concerns with this approach, or with the modelling process for this preliminary stage of the design process.

Mahurangi River

The modelling undertaken indicates that there is a negligible flooding difference between the pre and post development scenarios. Although some areas of flood level increase, including up to 1.8m upstream of the culverts and up to 1m upstream of Bridges 5 and 6, these areas are located within the designation and are within pasture or form part of a riparian area. The modelling indicates no increase in flood levels to dwellings outside the designation. However, this will be subject to a detailed design process.

Kourawhero Stream

The modelling indicates up to 2m increase in flood levels arising from the construction of the culverts and up to 1m increase from undertaking earthworks within the floodplain. The changes in flood levels arising from the earthworks will adversely affect 11, 18 and 30 Phillips Road. However, the dwellings within these sites are located inside the designation boundaries and are likely to be purchased by the Crown prior to construction commencing on the project. The existing flooding that occurs within the Kaipara Flats Road carriageway is not expected to be exacerbated post development based on the current modelling.

Wayby Valley

A flood depth increase north of Rustybrook Road of over 2m within the designation and up to 0.6m immediately outside of the designation, and also an increase up to 0.1m outside the designation at the junction of Rustybrook Road and Wayby Valley Road, and north of the interchange with SH1 and Wayby Valley Road, is expected based on the modelling undertaken. Excluding the existing road corridor, the areas prone to increased flooding are currently pasture and the application is proposing design measures to decrease flooding depths prior to construction.

It is also noted that the modelling indicates that the mitigation planting immediately upstream of the viaduct at Wayby Valley will increase flood depths by 0.15m. However, this is not expected to directly affect any existing dwellings.

Overall, Mr Sunich, on behalf on Healthy Waters, concludes that the flood hazard modelling that has been undertaken is suitable to assess the flood hazard effects at this stage of the process

and, acknowledging that further flood hazard modelling will occur at the detailed design stage, that any exacerbation of flood hazard as a result of constructing the motorway will be minor.

I rely on the expertise of Mr Sunich and Healthy Waters on these matters. However, in terms of the flood hazards noted, I do have some concerns regarding the areas of land outside of the designation identified as being subject to increased flood levels. Whilst the applicant has avoided any existing dwellings, the exacerbation of flooding on any land outside the designation limits use and development potential for the landowner. Mr Sunich has recommended refinements to proposed conditions 99 and 100 to address this concern.

In terms of the proposed amendments to condition 99(a) which states “The design of the Project does not result in an increase in the 100 year ARI flooding levels greater than 100mm vertically outside the Designation or create a flood risk to any habitable floor, including within the Designation”, I suggest further changes to this condition as noted below as a house may be located within the Designation but purchased by NZTA and be removed at some point due to the final design.

“The design of the Project does not result in an increase in the 100 year ARI flooding levels greater than 100mm vertically outside the Designation or create a flood risk to any habitable building, including a dwelling intended to remain within the Designation.”

Earthworks

In summary, the earthworks include approximately 12.4M m³ of cut and 9.6M m³ of fill over approximately 310ha along a 26km route between Warkworth to Wellsford (Te Hana). The earthworks will be undertaken in three sections being, the southern section from the southern extent of the project at Warkworth to the northern tunnel portal; the central section from the northern tunnel portal to the Hōteō River (southern abutment); and, the northern sections from the Hōteō River (northern abutment) to the northern tie in with existing SH1 near Maeneene Road, Te Hana. **Figure 1** below details the extent of earthworks for each of the construction sections.

	Total cut	Total fill	Cut suitable for reuse as structural fill	Structural Cut to Fill Surplus	Excess soil for disposal
South section	1,610,000	1,961,000	962,000	-203,000	0
Central section	6,169,000	3,393,000	3,807,000	554,000	2,550,000
North section	4,571,000	4,259,000	2,413,000	-45,000	829,000
TOTAL	12,350,000	9,613,000	7,182,000	306,000	3,379,000

Figure 1: Table 5-1: Indicative earthworks quantities for each construction section (AEE, Attachment 8, page 6)

It is anticipated that the indicative alignment will include a surplus of earthworks material of approximately 3.4 million m³ which will not be able to be reused. Potential soil disposal areas for this excess material have been identified within the designation boundaries. It is noted that some of these sites are located on streams and wetlands. However, no consents are being sought for reclamation activities associated with spoil disposal as these are indicative sites only. This matter is discussed in the ensuing section on freshwater ecology effects.

The management of the earthworks activity and its associated effects will be through a series of various management plans which will be prepared and certified by Council prior to works commencing. Mr Matthew Byrnes has outlined the approach in his technical memo as follows:

In general, the proposed resource consent conditions include the provision of an overarching erosion and sediment control plan (ESCP) which will inform the project's overall erosion and sediment control management approach, and more specifically, they include requirements for the provision of construction erosion and sediment control plans (CESCPs) ahead of works commencing at any given area of the site. The proposal also includes the provision of an adaptive monitoring plan (AMP) which is to help ensure that the project's erosion and sediment control measures and methodologies, adapt and change in response to actual "on the ground" monitoring results in order to help ensure that industry best practice is adhered to at all times throughout the land disturbance activities associated with the proposal. The above measures are currently utilised for the P2Wk project and based on my experience monitoring the earthworks as they relate to the erosion and sediment control aspects of that project, I consider them to be appropriate for this project. In brief, the project proposes the following:

- *Working to industry best practice at the time of construction;*
- *Staging of the land disturbance activities to limit the amount of exposed earth subject to rainfall and runoff erosion at any one time;*
- *The installation of perimeter controls to divert clean water away from exposed earth surfaces to help ensure that it does not enter the exposed earthworks area and contribute to the amount of water that requires treatment or affect the proposed sediment controls downslope of these boundaries.*
- *The establishment of dirty water diversions to direct sediment laden runoff to an appropriate treatment device before it is discharged to the receiving environment;*
- *Progressive and rapid stabilisation of exposed areas as necessary due to weather conditions or when earthworks in a given area are suspended or have been completed;*
- *The installation of sediment controls such as sediment retention ponds (SRPs), decanting earth bunds (DEBs), silt fencing and super silt fencing, and other impoundment devices to remove as much as much sediment as is practicable from the water column before it is discharged to the receiving environment; and,*
- *The continuous sampling and testing of water samples from selected SRP discharge locations and if elevated levels of sediment discharge are found to be occurring, then site based investigations are carried out to determine the cause and corrective actions and / or adaptations are implemented to reduce ongoing and future discharges.*

Overall, Mr Byrnes concludes that the applicant is proposing to utilise industry best practice measures for the management of the potential effects associated with erosion and the generation of sediment from the proposed earthworks activity. Mr Byrnes has, however, recommended changes to conditions which are discussed further below.

Guidance Document References

The current industry guideline for earthworks activity is currently the publication entitled 'Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region' (GD05) which superseded TP90 (Technical Publication 90 – Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region).

The application makes reference to standards in both GD05 and TP90 in regard to the practices proposed for erosion and sediment control. Mr Byrnes does not have any issue with the measures proposed, however, it is his preference that reference to older guidance documents such as TP90 is not made in the conditions as that may cause confusion for contractors. The suggestion is made by Mr Byrnes that any ESCP and CESP's refer to actual design details. Whilst I do not see this a significant concern I agree with Mr Byrnes that reference is not made to particular guidance documents but rather specific design details, particularly given the timeframe for construction may potentially be 10 years away and there is the possibility for GD05 to have been superseded at that time. The critical issue is that the conditions require the earthworks to be undertaken with the most appropriate best industry standards at the time of works, rather than what guidance document is referenced in the conditions.

Chemical Treatment Management Plan

Mr Byrnes generally agrees with the applicant regarding the requirement around a chemical treatment management plan (CTMP). However, based on his experience from monitoring similar sites, he has proposed two amendments:

- All decanting earthbunds (DEB's) are to be chemically treated by a rainfall activated system in accordance with the CTMP regardless of its contributing catchment (the applicant is not proposing a rainfall or flow activated system for DEB's with catchments less than 500m²).
- Removal of reference to flocculation socks as it is difficult to determine when the sock is empty or to manage the dose rate of the chemical.

Stabilisation & Open Area Limits

The application proposes a maximum open area of 143.3ha at any one time, split across three separate catchments. The Hoteo catchment having the largest open area being 75ha at any one time, the Mahurangi catchment being 43.3ha at any one time, and the Oruawharo being 25ha at any one time. Mr Byrnes however recommends that *"open area limits are decreased from the 1st of April to 50ha in the Hoteo catchment, 25ha in the Mahurangi catchment and 15 ha in the Oruawharo catchment. Should the consent holder wish to adjust these figures, they could apply to Council, via the normal process for amendments to the CESP's, for an increase. By imposing these restrictions, it would not only reinforce progressive stabilisation requirements but help ensure that the nominated contractor is not "caught out" towards the end of the earthworks season where they may not be physically able to stabilise significant areas due to access or availability of stabilisation equipment."*

Overall, based on the application details and taking into account the comments from Mr Byrnes, I consider that the erosion and sediment control methods proposed by the applicant when undertaking the earthworks for the project are appropriate and will not result in adverse water quality or ecological effects within the receiving environment. Whilst Mr Byrnes has

recommended amendments to the proposed conditions, I do not consider the changes to be significant and the rationale for the changes appears reasonable based on the experience of monitoring similar projects.

Marine Ecology and Coastal Avifauna

Whilst the application does not trigger any coastal related consents, the applicant has considered the effects of the project, notably the discharge of sediment during construction and stormwater during operation, on the ultimate receiving environments, being the Mahurangi Harbour via the Mahurangi River and the Kaipara Harbour via the Hoteo and Oruawharo Rivers.

The modelling undertaken by the applicant indicated the following:

- A 30 year ARI event in the Mahurangi catchment, if it occurred during earthworks, may result in project related sediment discharge causing significant adverse effects in the upper harbour benthic habitats and coastal avifauna;
- A 10 year ARI event in the Hoteo inlet of the Kaipara catchment, if it occurred during earthworks, may result in project related sediment discharge causing significant adverse effects in the upper harbour benthic habitats and coastal avifauna;
- A cumulative amount of sediment release above 5% of the baseline contribution would have significant effects within both the Mahurangi and Kaipara catchments.

To minimise these adverse effects on marine ecology and coastal avifauna within the Mahurangi and Kaipara Harbours, in addition to undertaking earthworks in accordance with best practice erosion and sediment control, the applicant is also proposing monitoring of sediment discharge and identifying trigger levels, which if reached, prompt the need for mitigation measures to be implemented.

Council's coastal ecologist, Dr Kala Sivaguru, has reviewed the relevant application documents and concludes the following:

In summary, subject to:

- *The effectiveness of the ESC devices and controls,*
- *The monitoring of the sediment triggers proposed by the applicant and subsequent in catchment mitigation to reduce sediment yields to the marine receiving environments;*
and
- *The proposed treatment of stormwater from the operational phase,*

it is my opinion that any adverse effects on marine ecology including avifauna and water quality from construction and the operational phase of the Project will not be significant.

Dr Sivaguru has noted, that whilst she generally supports the relevant conditions² proposed by the applicant, further evidence is welcomed from the applicant on why the acute and cumulative events as per the definitions have not been minimised as far as practically possible.

² Conditions 21b, 31 and 37-42

Overall, I rely on the expertise of Dr Sivaguru in assessing the marine ecology effects on the Mahurangi and Kaipara Harbours. Given the conclusions Dr Sivaguru has reached, I consider that overall the project, including the both the construction and operation phase, will have minor effects on the marine ecology and water quality within the receiving catchments.

Groundwater/Hydrogeology

The deep excavations and tunnel construction activities occurring below the ground water table will result in drawdown effects that may impact on the groundwater levels, surface water resources and groundwater quality and quantity. The application identifies the following effects:

- Groundwater drawdown in association with the construction of the tunnels is estimated to be 0.5m approximately 500m from the alignment of the tunnels and 5m or greater within 250m of the tunnel.
- In relation to the major cuts proposed, the maximum extent of drawdown is confined to a 230m corridor parallel to the indicative alignment and drawdowns of 5m or greater is confined to the immediate vicinity of the cut.
- 119 boreholes are located within 2km of the indicative alignment, with none located within the drawdown profiles for the tunnels or cuts, and one bore which is to be physically removed to facilitate construction.
- No specific streams have been identified within the vicinity of the drawdown profiles for the cuts. Gullies have been identified within the drawdown profiles for the tunnels. However, it is considered any baseflow reductions in these areas will be small and unlikely to be detectable over and above the influence of surface water runoff.
- The closest wetlands to any cuts, are those located at 89D Phillips Road. However, these are predominantly surface water fed by numerous streams flowing off the slopes to the north and the cut in this location is expected to be above the groundwater level.
- Ground surface settlement on any buildings and infrastructure outside of the designation boundary is not expected to occur. However, there may be some impact on infrastructure within the designation during construction and the operational phase. The applicant is proposing the use of geotechnical design, along with consultation with specific utility operators, to ensure that any ground settlement effects can be adequately mitigated.

The Council's hydrogeology specialist, Ms Sian France, has reviewed the relevant application documents and, whilst she concludes that the adverse effects on groundwater are likely to be less than minor, has raised concerns with the groundwater modelling that has been undertaken, notably that the magnitude and extent of groundwater drawdown has been underestimated in some locations. However, Ms France concludes that even if the extent of drawdown is greater than demonstrated in the application the adverse effects are still considered to be low and has proposed amendments to the conditions to address this scenario.

I rely on the expertise of Ms France, and based on the comments made by Ms France, and from reviewing the application documents, I consider that any changes to groundwater during the construction phase associated with the deep cuts and construction of tunnels, will be such that existing bore users will not be adversely affected and will still enable to drawdown water.

Furthermore, given the location of deep excavations relative to streams and wetlands, baseflows will not be adversely affected to any significant extent.

Ecology

In summary, the proposal includes the reclamation of 3.563ha of wetlands and the loss or modification to approximately 27km of watercourse for the facilitation of the following:

- Road embankments placed over streams and wetlands;
- Bridges over the Mahurangi and Hoteo Rivers;
- Culverts and culvert extensions exceeding 30m in length (outside of any overlay);
- Culverts within overlay areas not exceeding 30m in length;
- Stormwater outfalls and erosion protection structures;
- Temporary structures associated with the construction of bridges across the Mahurangi and Hoteo Rivers.

The council's streamworks specialist, Mr Mark Lowe, has assessed the application in terms of the reporting of ecological values and the quantum of offsetting being proposed and has raised some concerns which are discussed in more detail below.

Limited and Representative Assessment

The ecological assessment undertaken by the applicant due to the extent of the application area and access restrictions has not included physical visits to every watercourse and wetland. Therefore, there is some concern that the actual effects associated with any streamworks and wetland reclamation has not been fully assessed. To address this Mr Lowe has recommended a condition that once a final design has been agreed details are to be submitted to Council for certification which identifies the survey of stream and wetland extent impacted by the final design, the assessment of the ecological values at that time and the calculation of the required quantum of offset.

Further to this however, Mr Lowe also has some concerns regarding the proposed wording of the conditions and in particular 'where practicable', or 'impracticable'. For example,

*"The Consent Holder shall design and construct bridges, structures, culverts and embankments to cross the Kourawhero Stream to minimise change to the Kourawhero Wetland Complex and to maintain the pre-construction water table level, Wetland extent, and Wetland condition, as far as **practicable**,..."*

I agree with Mr Lowe in this regard and terms such as "as far as practicable" creates ambiguity and can be problematic from a monitoring perspective. Guidance around what is considered 'practicable' or 'impracticable' would be useful to add as an advice note to a condition of consent. Alternatively, Mr Lowe has suggested recommended changes to the proposed conditions.

Providing Certainty of Stream Outcomes

The applicant is proposing to create stream diversions in a manner that is equivalent in ecological functioning to that of the existing streams if these were to be restored. However,

based on the indicative diversion cross sections provided, Mr Lowe is not convinced that this will be achieved.

The cross-sections are 'indicative' and therefore I do not consider them to be the actual design for all stream diversions. However, to ensure that at the time of works the design is appropriate, I consider the proposed condition from Mr Lowe, which requires the design of diversions to incorporate 'like for like' and to be certified by Council, is an appropriate response to ensure that ecological values are maintained.

Providing for a Transparent and Quantitative Assessment to Determine Wetland Offset Requirements

The rationale for the enhancement ratios for offsetting the effects of the permanent loss of wetlands does not seem justified and fails to demonstrate that no net loss, or any ecological gain is achieved. Conditions of consent are therefore recommended to provide for assessment and calculation of appropriate offset ratios following detailed design, and prior to the adverse effects occurring. Unless further information is provided by the applicant to justify the rationale for the enhancement ratios then I consider that the proposed conditions by Mr Lowe are necessary to ensure that offsetting does not result in any net loss of ecological values.

Time Lag Between Adverse Effects and Implementing Offset Enhancement Actions

There is no definitive time proposed for when offsetting is to occur, and if it is undertaken some years after the time of impact then this needs to be considered as part of the offset package and it is unclear that this has been taken into account. To ensure that additional ecological impacts do not occur by having a time delay between an adverse effect on streams and wetlands occurring and the offset being implemented, conditions requiring offset actions to be undertaken each year, to be managed through 'Annual Offset Plans' submitted to Council for certification. I agree that a condition to that effect is necessary to minimise ecological effects.

Monitoring of the Kourawhero Wetland Complex

The applicant has recommended 12 months of monitoring of the water table levels for wetlands WN_W_Koura_02 to WN_W_Koura_05 (Kourawhero Wetland Complex) prior to construction to minimise any change and ensure the pre-construction water table level is maintained. Mr Lowe does not consider this sufficient and recommended that a three year monitoring project is undertaken which monitors not just water levels but also the wetland extent and ecological condition. Unless the applicant can provide justification for a 12 month monitoring period only then I rely on the expertise of Mr Lowe and agree with a recommended condition requiring a three year monitoring timeframe.

Protection and Ongoing Monitoring of Offset Sites

The application provides for offset sites to be subject to pest and weed management until they are well established. It is recommended that pest animal and plant control should continue for the duration of the impact, and preferably in perpetuity. It is recommended that protection mechanisms ensure:

- Native flora and fauna within the covenant boundary is protected.
- Ongoing pest plant and pest animal control.

- Stock are excluded.

Ongoing protection and maintenance of offset or mitigation sites is generally offered by applicants. However, the protection mechanism can vary between conditions of consent or land covenants and for varying timeframes. The important part is that the offsetting is undertaken and Council is satisfied that it is well established and achieves the intended ecological outcomes. It would be useful though if the applicant could provide further details on the long term maintenance of offset areas and that this was included within a maintenance plan for each offset area.

Site Specific Enhancement Plans

The application lacks site-specific details regarding the enhancement actions including weed control and planting proposed for the stream and wetland offset measures. Site specific planting and maintenance plans for all enhancement and offset areas are therefore recommended to be required by a condition of consent and for these to be certified by Council. Given the extent of the designation area and varying topographical and ecological features, I consider site specific plans are an appropriate response

Monitoring of Ecological Outcomes

Mr Lowe considers that a monitoring and reporting programme is required, which provides for an adaptive approach, to ensure that any offsetting achieves anticipated ecological outcomes. I consider this to be a necessary requirement to demonstrate that the offsetting proposed is appropriate and as a minimum achieves the ecological outcomes being sought.

Overall, Mr Lowe concludes that in order for him to support the proposal the ecological concerns outlined above need to be resolved and he has recommended conditions of consent to address the concerns that he has raised. Unless the applicant provides further information, which addresses the concerns raised by Mr Lowe, then I consider that the conditions that have been recommended are required to ensure that ecological effects can be appropriately managed and the intended outcomes achieved.

Further to the comments made by Mr Lowe above, he has also raised an issue with the indicative spoil disposal areas. The applicant has been clear in that the spoil disposal plans are indicative only and where they show spoil sites located within watercourses, reclamation consents are not being sought now as the spoil disposal sites are 'indicative' only. I have no issue with this approach but it would be beneficial, in relation to this application, if the applicant can confirm that there are sufficient locations within the designation to undertake the offsetting required, excluding the spoil disposal areas.

Cultural Effects

The earthworks, streamworks, discharge activities and vegetation removal proposed have the potential to adversely affect cultural heritage values attributed to the land and waterways within the designation area.

The applicant has been engaging with mana whenua through the alliance 'Hokai Nuku', which consists of manu whenua for the project area (Ngati Manuhiri, Ngati Mauku/Ngati Kauae of Te Uri o Hay, Ngati Rango of Ngati Whatua o Kaipara and Ngati Whatua Iwi).

The applicant has noted that they will continue to engage with Mana Whenua during the detailed design phase and also through the construction period to mitigate effects on cultural values. This continued engagement is reflected predominantly in the designation conditions and I will leave any comments on those to Mr Wayne Siu when assessing the NOR application.

Provided that the applicant continues to actively engage with Hokai Nuku then I believe effects on cultural values will be suitably avoided or mitigated.

Measures proposed to compensate or offset adverse effects

To offset residual adverse effects associated with the streamworks and wetland reclamation the application is proposing the following:

- Wetland enhancement at a ratio of 1:6 for wetland area assessed as 'high' and 'very high' ecological value and 1:3 for wetland area assessed as 'low' – 'moderate' ecological value, resulting in an estimated total of 11.25 ha of wetland enhancement.
- 71 km of stream riparian enhancement (comprising 10.1 km in Warkworth North; 9 km in Dome Valley; and, 13.5 km in Hoteo North).

Summary

Actual and potential effects conclusion

In summary, my opinion is that overall the proposed construction and ongoing operation of a new state highway between Warkworth and Te Hana will generate adverse effects that will be acceptable. This conclusion is, however, on the basis that the applicant, through the recommended conditions in **attachment 7**, or through the provision of additional information, addresses the concerns raised by Mr Lowe in relation to ecological effects.

Relevant statutory documents - s104(1)(b)

National Environmental Standard – s104(1)(b)(i)

The following standards are in force as regulations:

- National Environmental Standards for Air Quality (NES:AQ)

The NES:AQ are regulations which set a minimum level of health protection for all New Zealanders through establishing guidelines for managing and monitoring air quality. Included within the regulations are ambient air quality standards which are the minimum requirements that outdoor air quality should meet in order to guarantee a set level of protection for human health and the environment.

Council's Air Quality specialist, Mr Paul Crimmins, upon assessing the application concludes that the operational air discharges are not predicted to adversely affect ambient air quality. In addition, provided that mitigation measures are adhered to in relation to construction dust, the construction works will also comply with the regulations contained within the NES:AQ.

- National Environmental Standard for Sources of Human Drinking Water

These standards establish criteria to ensure that sources of human drinking water are not contaminated. Sediment discharge during construction and stormwater discharge during operation will be managed appropriately and will not result in a degradation of the water quality for any source of human drinking water.

- National Environmental Standards for Electricity Transmission Activities (NES:ET)

The NES:ET recognises the national significance of electricity transmission and as applicable to this application, seeks to manage the adverse effects of other activities on the network.

It is acknowledged that the proposed designation boundary incorporates a Transpower designation. Mr Siu in his reporting on the NOR application will provide comment on this NES.

- National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES:CS)

As mentioned previously, although activities that may result in land contamination have been identified within the designation area consent is not being sought in relation to the NES:CS and therefore I have not assessed the application against these provisions.

- National Environmental Standards for Plantation Forestry (NES:PF)

The NES:PF came into force in 2018 in an attempt to have consistent regulations for plantation forestry activities across the nation, as opposed to varied regulations as established by regional and district authorities. The objectives of the NES:PF are to maintain or improve the environmental outcomes associated with plantation forestry activities and increase the efficiency and certainty of managing these activities.

Part of the designation area consists of a commercial plantation. No resource consents in relation to the clearance of this plantation are being sought at this point in time as it may be cleared prior to construction by a forestry operator. In the event that the forest is not cleared prior to the commencement of construction activities, the applicant will undertake the clearance works and seek any consents that may be required at that time.

- Resource Management (National Environmental Standards for Freshwater) Regulations 2020

These regulations come into effect 3rd September 2020 and given that the application was lodged in March 2020, the application as submitted has not been considered under these regulations.

It is considered that the highway meets the definition of 'specified infrastructure'³ and of relevance to this application is section 45 which notes that vegetation clearance, earthworks, land disturbance within, or within a 10m setback from a natural wetland for the purpose of constructing specified infrastructure will require consent as a discretionary activity.

National Policy Statement – s104(1)(b)(iii)

These national policy statements are in place:

- National Policy Statement for Freshwater Management (NPS:FM)

The National Policy Statement for Freshwater Management 2020 came into effect on 3rd August 2020 and is focused on safeguarding the health and well-being of water bodies and freshwater ecosystems, which will enable people to provide for their health, social, economic and cultural well-being now and in the future⁴.

The NPS:FM sets out what regional councils need to do to ensure that the provisions of the plans are consistent with the objectives and policies of the NPS:FM and recommends rules, objectives, policies and monitoring frameworks to achieve the protection, maintenance and restoration of freshwater bodies.

In the context of a resource consent the 'effects management hierarchy'⁵ is considered pertinent. The proposal is not avoiding adverse effects on wetlands and streams, however, it is proposing offsetting to address the residual adverse effects. Provided that the quantum of offset is appropriate then I do not consider the proposal to be contrary to the outcomes sought in the NPS:FM.

New Zealand Coastal Policy Statement 2010 (NZCPS) – s104(1)(b)(iv)

The purpose of the NZCPS is to state policies in order to achieve the purpose of the RMA in relation to the coastal environment of New Zealand.

The relevant objectives and policies of the NZCPS include:

- Objective 1
- Policy 2 (The Treaty of Waitangi, tangata whenua and Maori)
- Policy 22 (Sedimentation)
- Policy 23 (Discharge of contaminants)

The relevant provisions of the NZCPS have been considered. I have concluded that the proposal is consistent with the NZCPS as the earthworks will be undertaken in accordance with best practice erosion and sediment controls to appropriately manage sediment discharge into the Mahurangi and Kaipara Harbours, and discharge during the operation of

³ Specified Infrastructure – meaning given by the NPS for Freshwater Management, including infrastructure that delivers a service operated by a lifeline utility (as defined in the Civil Defence Emergency Act 2002). A lifeline utility includes an entity that provides a road network, including a state highway.

⁴ 2.1 Objective (1) of the NPS:FM

⁵ 3.21 (1). Pg22 'Definitions relating to wetlands and rivers'

the highway will be treated prior to discharge to ensure water quality in the harbours is maintained.

Hauraki Gulf Marine Park Act 2000 (HGMPA) – s104(1)(b)(iv)

The council must have regard to sections 7 and 8 of the HGMPA when it is considering an application for resource consent for the Hauraki Gulf, its islands, and catchments. These sections are treated as a New Zealand coastal policy statement.

Section 7 recognises its national significance, while s8 outlines the objectives of the management of the Hauraki Gulf, its islands and catchments.

The objectives seek to protect, maintain and where appropriate enhance the life supporting capacity of the environment of the Hauraki Gulf and its islands.

The proposal has the potential to have impacts on the Hauraki Gulf as the works occur within a catchment that drains to the Gulf.

The proposed earthworks will be undertaken in accordance with best practice erosion and sediment controls and the stormwater runoff is to be treated prior to discharge. These measures will adequately mitigate effects of the proposal on the Hauraki Gulf and will maintain water quality and marine ecology values.

Auckland Unitary Plan (Operative in part): Chapter B Regional Policy Statement – s104(1)(b)(v)

Chapter B of the AUP(OP) sets out the strategic framework for the identified issues of significance, and resultant priorities and outcomes sought. These align with the direction contained in the Auckland Plan.

B3 Infrastructure, transport and energy

B3.3.1 Objective (1)

B3.3.2 Policies (1), (2), (3), (7)

The above objective and policies seek to provide for effective, efficient and safe transport networks and that adverse effects arising from the construction and operation of transport infrastructure are avoided, remedied or mitigated.

It is considered the proposal is consistent with this objective and policies as it will provide for a safer and more efficient route to the north, between Warkworth and Wellsford. The adverse effects arising during construction and the ongoing operation of the road can be adequately mitigated through the imposition and adherence to appropriate conditions.

B7 Natural Resources

- B7.3 Freshwater systems

B7.3.1 Objectives (1), (2), (3)

B7.3.2 Policies (4), (6)

One of the issues facing the Auckland region is the pressure on water resources, including associated habitats and biodiversity, that has occurred from growth and development.

The above objectives and policies seek to minimise the further loss of freshwater systems and avoid loss, modification and diversion of streams and wetlands unless it is necessary for infrastructure and that where adverse effects cannot be adequately mitigated, environmental benefits are provided.

The works will not avoid freshwater features and includes stream diversion works and wetland reclamation. However, given that the proposed works are associated with the provision of infrastructure and commensurate offsetting will be undertaken within the designation, the proposal overall is consistent with these objectives and policies.

- B7.4 Coastal water, freshwater and geothermal water

B7.4.1 Objectives (4), (5)

B7.4.2 Policies (1), (7), (8), (9)

The aim of the above objectives and policies is to ensure that water quality is maintained or improved where currently degraded. Of relevance to this application is managing the discharge of contaminants and stormwater in a manner that maintains water quality and that land disturbing activities are undertaken using industry best practice and standards to minimise the loss of sediment into fresh water and coastal water.

During the construction phase the earthworks activity will be undertaken in accordance with appropriate erosion and sediment control methods to ensure that sediment discharge can be managed. During the operational phase stormwater runoff will be treated in accordance with current best practice design guidelines and the receiving environment, being the Mahurangi Harbour via the Mahurangi River and the Kaipara Harbour, via the Hoteo and Oruawharo Rivers, will not result in a degradation of water quality as a result on the proposed motorway in its operational phase.

- B7.5 Air

B7.5.1 Objectives (1) and (3)

B7.5.2 Policies (1)

These objectives and policy aim to manage the discharges of contaminants into the air to avoid significant adverse effects on human health, protects flora and fauna, manages reverse sensitive effects and enables the operation of certain activities such as infrastructure by providing for low quality amenity in appropriate locations.

During the construction and operational phase air quality will generally be maintained and any discharge of dust or contaminants to air will not be of a noticeable level and will not adversely affect air quality.

B10 Environmental Risk

B10.2.1 Objectives (3), (4) and (6)

B10.2.2 Policies (1), (3), (4), (5), (7), (8), (11) and (12)

The above objectives and policies seek to ensure that the risks to people, property, infrastructure and the environment are not increased. This is to be done by assessing natural hazards using the most recent hazard information and undertaking appropriate flood modelling, which includes having regard to potential effects of climate change.

Although the applicant has not undertaken extensive flood hazard modelling across the entire project area they have identified and assessed current and future flood risks associated with the project that takes into account climate change projections, to the satisfaction of the Council's flooding experts. Provided that further flood hazard modelling is undertaken as part of the detailed design process and flood mitigation measures are utilised to address any exacerbation of flooding identified it is considered the proposal will be consistent with the aforementioned objectives and policies.

Plan or Proposed Plan – section 104(1)(b)(vi)

Auckland Unitary Plan (Operative in part)

Relevant objectives and policies

D1 High-use Aquifer Management Areas Overlay

D1.2 Objective (1)

D1.3 Policy (1)

Whilst the applicant is not proposing to take water from any high use aquifer they are proposing dewatering during construction which may impact on the ability of existing users to meet their water take demands and also affect base flow for surface streams.

Given the location of the drawdown areas relative to surface streams and existing bores it is considered that any effect on base flows will be minor and existing water take users outside of the designation are not expected to be affected. The proposal therefore is consistent with this objective and policy.

E1 Water quality and integrated management

E1.2 Objectives (1), (3),

E1.3 Policies (11), (12), (14)

These objectives and policies aim to ensure that contaminants in stormwater runoff from high use roads are managed to minimise adverse effects on water quality. As previously mentioned, during the operational phase stormwater runoff will be treated in accordance with current best practice design guidelines and the receiving environment, being the Mahurangi Harbour via the Mahurangi River and the Kaipara Harbour, via the Hoteo and Oruawharo Rivers, will not suffer unacceptable degradation of water quality as a result on the proposed motorway in its operational phase.

E3 Lakes, rivers, streams and wetlands

E3.2 Objectives (1), (2), (3), (4), (5), (6)

E3.3 Policies (1), (2), (3), (4), (5), (6), (10), (11), (12), (13), (15)

The objectives and policies of E3 seeks to retain and enhance lakes, rivers, streams and wetlands and any permanent loss is minimised and significant modification or diversions of waterways is avoided. In the instance where adverse effects cannot be avoided, remedied or mitigated consideration can be given to residual adverse effects being offset through the provision of environmental benefits either on, or off site. Any works undertaken as part of an offsetting proposal should be located as close to the subject site as possible, be 'like for like' in terms of the type of freshwater system affected and achieve no net loss, or a net gain in the natural values and ecological functions of waterways.

The proposal includes reclamation of wetlands and also the diversion of streams and in this respect is not consistent with the general outcomes being sought by the E3 objectives and policies. However, the policies do enable reclamation, diversion, disturbance and deposition when associated with the development, operation, use and maintenance of infrastructure. Given that the proposal relates to roading infrastructure and subject to the imposition of the proposed conditions in relation to ecological matters, or further information submitted in response to these, the proposal is not considered on balance to be contrary to the objectives and policies of E3.

E11 Land Disturbance – Regional

E11.2 Objectives (1), (2), (3)

E11.3 Policies (2), (3), (4), (5), (6), (7), (8)

It is acknowledged that land disturbance is required for development and the above objectives and policies seek to ensure that any land disturbance is undertaken in a manner that protects the safety of people, and avoids, remedies or mitigates the adverse effects on the environment.

No stability concerns have been raised in relation to the proposed earthworks and best practice industry standards will be utilised to manage sediment discharge, and overall it is considered that the proposed earthworks will be consistent with the above objectives and policies.

E14 Air Quality

E14.2 Objectives (2), (4)

E14.3 Policies (1), (3), (8)

These objectives and policies relate to the management of air quality and seek to maintain air quality in those parts of the Auckland region which have high air quality, but also provide for industrial/business uses and the operation of infrastructure where air quality can be maintained as acceptable levels.

The proposal, during construction and operation will comply with these objectives and policies as no exceedance of the 'Auckland Ambient Air Quality Targets' is expected to occur and the dust management techniques will mitigate any offensive or objectionable amenity effects.

E26 Infrastructure

E26.2.1 Objectives (1), (2), (3), (4), (8)

E26.2.2 Policies (1), (2), (3), (4), (5), (6), (14), (15)

The objectives and policies of E26 provide a framework for the development, operation, use, maintenance, repair, upgrading and removal of infrastructure. In particular, the provisions aim to ensure that the benefits of infrastructure are recognised and enable the development and ongoing use whilst ensuring adverse effects of infrastructure are avoided, remedied or mitigated.

Roads should be designed and located to ensure that the needs of all road users and modes of transport are met in a safe and efficient manner, and that the construction and operation of roads avoids, remedies or mitigates adverse effects on people, communities and the environment.

The proposal is considered to be consistent with these objectives and policies as the new state highway will provide a safer and more efficient connection between Warkworth and Te Hana and the adverse effects during construction and operation can be appropriately mitigated through conditions of consent.

E36 Natural Hazards and Flooding

E36.2 Objectives (1), (4) and (5).

E36.2 Policies (1), (3), (4), (18), (20), (21), (23), (27), (29), (30) and (35).

These objectives and policies seek to ensure that development outside of urban areas does not create a risk of significant adverse effects to people, property, infrastructure and the environment from natural hazards alongside the likely long-term effects of climate change. Of particular reference to this application is policy (35) which allows for the construction of infrastructure within areas subject to natural hazards when it is functionally required to be located there or not reasonably practicable for it to be located elsewhere and that all flood hazard areas risks to people, property and the environment are mitigated to the extent practicable.

Given the extent of the project area, it is not reasonably practicable to avoid all areas of land along the designation corridor subject to natural hazards. The applicant has undertaken appropriate flood hazard modelling to date and will continue to do so as part of the detailed design process to ensure that people and property do not experience significant flooding effects.

Conclusion

In accordance with an assessment under s104(1)(b) of the RMA the proposal is generally consistent with the relevant statutory documents.

In particular it is considered that the proposed earthworks, discharge activities and groundwater diversions can be undertaken in a manner whereby the adverse effects can be appropriately managed and overall the proposal will be consistent with the relevant objectives and policies associated with these activities and as referenced above. Whilst the proposal is not entirely consistent with the objectives and policies in E3, that seek to avoid wetland reclamation and stream diversions, it is not inconsistent with them to an unacceptable degree as the provisions do enable these outcomes when associated with infrastructure and an acceptable level of ecological offsetting is to be undertaken.

14. Any other matter – section 104(1)(c)

Section 104(1)(c) requires that any other matter the consent authority considers relevant and reasonably necessary to determine an application be considered.

The applicant at section 11.3 of the AEE (Table 11-1) has set out those other matters and documents that they consider relevant to both the NOR and resource consent applications.

Of those documents as noted, I consider the following to be of relevance to the resource consent matters:

- Kawerau a Maki Trust Resource Management Statement 1994
- Interim Ngati Paoa Regional Policy Statement 2013
- Ngati Paoa Resource Management Plan 1996
- Mahurangi Action Plan 2010
- Kaipara Harbour Integrated Strategic Plan of Action 2011
- The New Zealand Biodiversity Strategy 2000-2020
- Proposed National Policy Statement on Indigenous Biodiversity 2011
- Auckland Indigenous Biodiversity Strategy 2012

These documents relate to addressing and managing cultural and ecological effects and seek to ensure that any development has regard to the objectives of these documents and that effects are avoided, remedied or mitigated to maintain or enhance cultural, biodiversity and ecological values. Provided that the proposed construction works and ongoing operation of the highway is undertaken in accordance with the application and proposed conditions, notably in relation to continued engagement with Mana Whenua, managing sediment and stormwater discharge and undertaking ecological offsetting, the application is considered overall to be consistent with the outcomes sought in these documents.

Submissions

All of the submissions received by the council in the processing of this application have been reviewed and considered in the overall assessment of effects in this report. The council's specialists have also reviewed the relevant submissions as required and incorporated comments into their assessments accordingly.

A number of the submissions on the resource consent applications have raised concerns which are outside of the remit for the reasons for consent and therefore I have not addressed these matters. Mr Siu, in his assessment of the NOR application will address these, including landscape/visual effects, the designation boundaries, amenity effects, construction related effects, land acquisition, compensation and traffic concerns.

The matters raised below have been addressed in the various technical reports and broadly addressed in the assessment within section 13 of the report. I have also specifically commented below on the main issues as raised within submissions.

Flooding

Concerns were expressed by submitters that flooding on properties and local roads will be exacerbated from the project⁶. Mr Sunich has commented on this within his technical report and concludes that any exacerbation of flood risk is confined to land within the designation boundaries. However, he has proposed amendments to the conditions to ensure that once detailed design has been established further modelling is to be undertaken to ensure flooding on land outside the designation is not exacerbated and if required, mitigation measures are put in place.

Stormwater Disposal

An increase in contaminant levels from the operational phase, and subsequent adverse effects on water quality was raised in submissions. Ms Sharma has assessed the stormwater treatment methods being proposed and considers that the stormwater management approach, along with ongoing monitoring and maintenance will ensure that water quality is maintained within the receiving environments.

Sediment Discharge

As aforementioned, the earthworks will be undertaken in accordance with best practice erosion and sediment control measures to appropriately manage adverse effects on the water quality of the receiving environments.

Air Quality

Construction dust effects have been raised as a concern and greater dust management practices are suggested to manage these effects. Mr Crimmins considers that the proposed conditions are worded appropriately to ensure that discharges of dust can be managed, or that the wording allows for measures to be put in place as suggested in the submission⁷.

Ecological Effects

A number of submitters⁸ have raised concerns in relation to ecological effects, including impacts on streams and wetlands, the inadequacy of the mitigation and offsetting proposed, reliance on management plans and conditions of consent to manage effects and the requirement for protection and ongoing maintenance of offset sites. Mr Lowe has addressed these concerns broadly within his assessment and has raised similar concerns himself which he has proposed can be addressed through recommended conditions of consent.

Waste Management New Zealand⁹ (WMNZ) has submitted on the Notice of Requirement application including comments on ecological mitigation and therefore I have considered their submission as part of the resource consent application. WMNZ is proposing as part of their current applications for a regional landfill to plant one side of the Waiteraire Stream, adjacent to State Highway 1 as part of the compensation package for their

⁶ Submitters JS1, JS4 RC31, RC34, RC35

⁷ Submitter JS1

⁸ Submissions JS1, JS3, JS4, JS7, JS8, JS9, JS10, RC24, RC29, RC33, RC31, RC18, RC30

⁹ Submission NOR16

proposed development. The proposed designation has the potential to conflict with this planting, although it is noted that NZTA are currently not showing any plans for planting or enhancement within this area. I have discussed this matter with Mr Lowe and it is considered that this is a property matter between WMNZ and NZTA.

Groundwater

Concerns were raised regarding the potential impact of the groundwater drawdowns on the quantity of surface water and groundwater, and availability of water for existing bores¹⁰. Council's expert, Ms France, expects that given the depths of existing bores and location to the proposed cuts, existing bores are unlikely to be affected. However, she has recommended a condition of consent requiring a bore survey of any properties, and assessment of streams, within the zone of calculated drawdown to ensure existing water takes are not affected.

Concerns were also raised in relation to settlement damage to pipes¹¹. The applicant is proposing a condition which states that works "*do not adversely impact on the ongoing safe and efficient operation of Network Utility Operation*". Ms France is comfortable that a condition of this nature will provide the appropriate level of protection to pipes.

Conditions

Comments were raised in the submissions¹² regarding the proposed conditions and requesting that these are made more robust if consent is to be granted. The draft proposed conditions rely heavily on the preparation of future management plans to mitigate effects.

It is acknowledged that the applicant has yet to undertake detailed design of the highway and therefore proposes the use of management plans as a method for providing a greater level of detail at a later date, when detailed design is further progressed. I also acknowledge that draft management plans have not been prepared and instead draft conditions have been proposed to direct the purpose, objectives and content of future management plans.

The Council's technical experts have reviewed the technical reports provided with the application and the proposed detail for inclusion within management plans. As a result of these reviews, changes have been proposed to the conditions to make the conditions more robust, to ensure that adverse effects are appropriately mitigated. Based on the revised conditions I consider the 'management plan' approach via conditions with a clear purpose and content to be appropriate and will ensure that adverse effects during both the construction and operational phases will be managed appropriately.

Cultural Effects

A number of the comments raised in the submission from Hokai Nuku relate to the proposed designation conditions and I have left any comment on these to Mr Siu. In

¹⁰ Submission JS4 & JS9

¹¹ Submission JS4

¹² Submission JS1, JS12, JS3, JS7, JS8, JS10, RC33

relation to the resource consent conditions, amendments are sought in relation to the conditions regarding the 'Cultural Indicators Report'.

Currently the conditions state that at least 6 months prior to the start of detailed design, the Consent Holder shall invite Mana Whenua to prepare a Cultural Indicators Report¹³. The submission is seeking a revision to the wording to reference '12 months prior', and for the report to be completed 6 months prior to the start of detailed design. I do not see an issue with this timeframe as it does not result in delays to the project, provides time for the report to be prepared and for it to be reviewed by the consent holder prior to the detailed design stage.

The submission also seeks to incorporate into condition 9 the requirement for plans to take into account the whole of the Cultural Indicators Report. I do not think this change is necessary as proposed condition 10 requires the consent holder to have regard to the Cultural Indicators Report. However, the condition, as currently worded, includes the clause 'where practicable to do so'. It is recommended that the applicant provide guidance as an advice note to the condition as to what is deemed 'practicable' or 'not practicable'.

Hokai Nuku are also seeking an amendment to the definition of 'mana whenua' within the set of conditions. The conditions define mana whenua as:

"Māori with ancestral rights to resources in the Project area and responsibilities as kaitiaki over their tribal lands, waterways and other taonga."

Hokai Nuku are seeking the following definition of mana whenua to be incorporated into the conditions:

"Maori who can demonstrate customary rights through occupation to resources within the Project designation, and who have responsibilities as kaitiaki over their tribal lands, waterways and other taonga."

I have no issue with the proposed change in wording and have incorporated this into the definitions table contained within the set of proposed conditions in **attachment 7**.

Local Board comments

An invitation to the Local Board was sent on the 14th May 2020 for any comments in relation to this application. At the time of writing this report no comments had been received from the Local Board in relation to the resource consent matters. I note that the Local Board have provided a resolution to inform Mr Sui's report.

15. Other relevant RMA sections

Monitoring – s35

In granting consent to an application, a council may impose conditions to offset any adverse effects associated with the resource consent. In addition, a council is required to monitor the exercise of resource consents under section 35 of the RMA and may fix a

¹³ Condition 8, Attachment 7

charge under section 36 payable by the consent holder in order to carry out monitoring functions. The amount that can be charged is based on actual and reasonable costs associated with monitoring and covers such tasks as site inspections, carrying out tests and administration.

Monitoring is considered appropriate in this instance given the scale of the project and is reflected in the wording of the proposed conditions.

Matters relevant to discharge and coastal permits – s105

The proposal requires a consent to discharge contaminants under s15. Under section 105, the council must have regard to additional matters for any application for a discharge permit or a coastal permit that would contravene s15 or s15B of the RMA. The proposal is considered to satisfy the matters set out in s105 because the discharges do not give rise to any significant air quality effects and the reasons for discharges of contaminants into air are appropriate in the circumstances and I have concluded the discharge of sediment from the project is a permitted activity.

Restrictions on discharge permits – s107

The council must have regard to the restriction on the granting of certain discharge permits that would contravene sections 15 or 15A. The proposal satisfies the provisions of s107 because the stormwater discharges do not give rise to water quality issues in the receiving environments.

Conditions of resource consents – ss108, 108AA

The recommended conditions of consent are contained in **attachment 7**, but there are some matters raised with the proposed conditions that require specific comment as noted below.

Condition 1 – ‘In Accordance’

As a general rule all resource consents contain as the first condition a requirement for the activity to be undertaken in accordance with the plans and all the information submitted with the application. The proposed set of conditions from the applicant does not contain any condition requiring works to be undertaken in accordance with the application documents.

There may be a reluctance on the part of the applicant to have a condition of this nature given that no detailed design has been determined, however without such a condition there appears to be no specific link to the application documents as lodged and any activity that may be granted consent. From experience this creates a lack of certainty at implementation stage for council, particularly where changes to a project are sought.

It is therefore suggested that an ‘in accordance’ condition is added, or alternatively a preamble at the start of the suite of resource consent conditions which outlines the activities authorised, the geographical extent that the consents apply to, and a disclaimer

that the final details shall be provided to the Auckland Council through plans and certificates submitted in accordance with the conditions that follow.¹⁴

Air Quality Conditions

Proposed conditions 86 and 87 within the set of designation conditions relate to air quality matters. Given air quality is a regional consent trigger it is considered more appropriate for any air quality related conditions to sit within the suite of resource consent conditions and therefore air quality conditions have been proposed within the set of conditions in **Attachment 7** (conditions 101, 102 and 103).

Stakeholder and Communications Conditions

The proposed designation conditions require a 'Stakeholder and Communications Management Plan' to set out the framework for communication between the requiring authority and the public and stakeholders.¹⁵ In addition, the designation conditions detail the complaints process for any complaints received in relation to the project works throughout their duration¹⁶. It is recommended that similar, or the same conditions are included within set of resource consent conditions to ensure that communication and a process for complaints is enabled for any works associated with the regional consents.

Review Condition

The applicant has proposed a review condition¹⁷ that provides Council with the opportunity to review the conditions consent. However, it is also recommended that a review condition is imposed that requires an annual review of the certified management plans to ensure that they achieve their purpose and objectives. As part of the review process there should also be the ability to vary the management plans to address any shortcomings that may arise from undertaking a review and I have drafted a condition as noted below:

The Consent Holder shall review the management plans at least annually or

- *As a result of a material change to the Project; or*
- *To address unforeseen adverse effects arising from construction or unresolved complaints.*

Such a review may be initiated by either the Council or the Consent Holder and shall take into consideration:

- a) Compliance with resource consent conditions, management plans and material changes to these plans;*
- b) Any changes to construction methods;*

¹⁴ Refer to BOI resource consent conditions for the Puhoi to Warkworth Section as an example

¹⁵ Refer to conditions 8-10 within the suite of proposed designation conditions.

¹⁶ Refer to conditions 11-14 within the suite of proposed designation conditions

¹⁷ Refer to proposed condition 2, Attachment 7

- c) *Key changes to roles and responsibilities relating to the Project;*
- d) *Changes in industry best practice standards;*
- e) *Changes in legal or other requirements;*
- f) *Results of monitoring and reporting procedures associated with the management of adverse effects during construction;*
- g) *Any complaints and any response to complaints and remedial action taken to address the complaint.*

A summary of the review process shall be kept by the Consent Holder, provided annually to the Council, and made available to the Council upon request.

Duration of resource consents – s123

The applicant is seeking resource consents for the following duration:

- Unlimited duration in respect to land use consents under section 9(2)
- 15 years from the date of commencement in relation to consents required for construction activities (sections 9(2), 14 and 15)
- 35 years from the date of commencement under sections 9(2), 13, 14 and 15 in relation to the consents required during the operational phase.

The timeframes as sought are considered appropriate and take into account the scale of the project and expected construction timeframes.

Lapsing of resource consents – s125

Under s125, if a resource consent is not given effect to within five years of the date of the commencement (or any other time as specified) it lapses automatically, unless the council has granted an extension. In this case, that applicant is seeking a lapse period of 15 years for each of the resource consents given the range and scale of the works involved and also having regard for the detailed design stage and any required property acquisitions.

Accordingly, 15 years is considered an appropriate period for the consent holder for the reasons as outlined.

16. Consideration of Part 2 (Purpose and Principles)

Purpose

Section 5 identifies the purpose of the RMA as the sustainable management of natural and physical resources. This means managing the use of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being while sustaining those resources for future generations, protecting the life

supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

Principles

Section 6 sets out a number of matters of national importance which need to be recognised and provided for. These include the protection of outstanding natural features and landscapes, the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna, and the protection of historic heritage.

Section 7 identifies a number of “other matters” to be given particular regard by the council in considering an application for resource consent. These include the efficient use of natural and physical resources, and the maintenance and enhancement of amenity values.

Section 8 requires the council to take into account the principles of the Treaty of Waitangi.

Assessment

Any consideration of an application under s104(1) of the RMA is subject to Part 2. The Court of Appeal in *R J Davidson Family Trust v Marlborough District Council* [2018] NZCA 316 has held that, in considering a resource consent application, the statutory language in section 104 plainly contemplates direct consideration of Part 2 matters, when it is appropriate to do so. Further, the Court considered that where a plan has been competently prepared under the RMA it may be that in many cases there will be no need for the Council to refer to Part 2. However, if there is doubt that a plan has been “competently prepared” under the RMA, then it will be appropriate and necessary to have regard to Part 2. That is the implication of the words “subject to Part 2” in s104(1) of the RMA.

In the context of these discretionary activity applications for landuse, water permits, air discharge, stormwater discharge and streamworks, where the objectives and policies of the relevant statutory documents were prepared having regard to Part 2 of the RMA, they capture all relevant planning considerations and contain a coherent set of policies designed to achieve clear environmental outcomes. They also provide a clear framework for assessing all relevant potential effects, and I find that there is no need to go beyond these provisions and look to Part 2 in making this decision as an assessment against Part 2 would not add anything to the evaluative exercise.

17. Conclusion

Overall the proposal is considered to be generally consistent with the relevant objectives and policies of the AUP:OP and will provide for improved transport links between Auckland and Northland without generating an unacceptable level of adverse effects on the environment.

18. Recommendation

Recommendation on the applications for resource consents

Subject to new or contrary evidence being presented at the hearing, I recommend that under sections 104, 104B, 104C, 105, 107 and Part 2, resource consents are **GRANTED** to the following applications:

Land use consent (s9) – LUC60354952 & LUC60355185

Auckland Unitary Plan (Operative in part)

E26 Infrastructure (LUC60354952)

- To create stormwater detention/retention ponds and wetlands associated with the project as a controlled activity under rule E26.2.3.1 (A55).
- The removal and alteration of vegetation that does not comply with standards E26.3.5.1 to E26.3.5.4 as a restricted discretionary activity under rule E26.3.3.1 (A77).
- Earthworks activity greater than 50,000m² where land has a slope less than 10 degrees outside the Sediment Control Protection Area as a restricted discretionary activity under rule E26.5.3.2 (A103).
- Earthworks activity greater than 2,500m² where the land has a slope equal to or greater than 10 degrees as a restricted discretionary activity under rule E26.5.3.2 (A106).
- Earthworks activity greater than 2,500m² within the Sediment Control Protection Area as a restricted discretionary activity under rule E26.5.3.2 (A107).
- Earthworks activity between 10m² - 2500m² and from 5m³ - 2500m³ within an SEA as a restricted discretionary activity under rule E26.6.3.1 (A117).
- Earthworks activity greater than 2500m² or 2500m³ within a SEA as a discretionary activity under rule E26.6.3.1 (A118).

E9 Stormwater quality – High contaminant generating car parks and high use roads (LUC60355185)

- Development of a new or redevelopment of an existing high use road greater than 5000m² as a controlled activity under Rule E9.4.1 (A7).

Streamworks consent (s13 & 14) – LUS60354955 & WAT60354953

Auckland Unitary Plan (Operative in part)

E3 Lakes, rivers, streams and wetlands

- Diversion of a stream with associated disturbance and sediment discharge outside of any overlays as a discretionary activity under rule E3.4.1 (A19).

- Any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific standards in E3.6.1.10 – E3.6.1.13 (outside overlays) as a discretionary activity under rule E3.4.1 (A26).
- Temporary structures that comply with the standards within E3.6.1.15 within overlays, as a discretionary activity under E3.4.1 (A27).
- Bridges or pipe bridges within overlays that comply with the standards in E3.6.1.16 as a discretionary activity under rule E3.4.1 (A29).
- Culverts more than 30m in length when measured parallel to the direction of water flow outside of any overlay as a discretionary activity under rule E3.4.1 (A33).
- Erosion control structures within an overlay that is less than 30m in length when measured parallel to the direction of water flow and complies with the standards in E3.6.1.14 as a discretionary activity under rule E3.4.1 (A34).
- Stormwater outfalls within an overlay that comply with the standards in E3.6.1.14 as a discretionary activity under rule E3.4.1 (A39).
- Activities outside of any overlay 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 as a discretionary activity under rule E3.4.1 (A44).

Water Permit (s14) – WAT60355184 & WAT60356979

Auckland Unitary Plan (Operative in part)

E7 Taking, using, damming and diversion of water and drilling (WAT60355184)

- Dewatering and groundwater level control for the long-term operation of the road cuts, not complying with standards E7.6.1.6(2) and (3) as a restricted discretionary activity under rule E7.4.1 (A20).
- Excavations for the road alignment will exceed 1ha in total area and 6m depth below natural ground level and the diversion cannot comply with standard E7.6.1.10(2), requiring consent as a restricted discretionary activity under rule E7.4.1 (A26).

E8 Stormwater – Discharge and diversion (WAT60356979)

- Diversion of stormwater runoff from new impervious surface areas which exceeds 5000m² and which does not comply with standards E8.6.1 and E8.6.4.1 as a discretionary activity under Rule E8.4.1 (A10).

Discharge Permit (s15) – DIS60354954 & DIS603551896

Auckland Unitary Plan (Operative in part)

E8 Stormwater – Discharge and diversion (DIS60354954)

- Discharge of stormwater runoff from new impervious surface areas which exceeds 5000m² and which does not comply with standards E8.6.1 and E8.6.4.1 as a discretionary activity under Rule E8.4.1 (A10).

E14 Air Quality (DIS603551896)

- Temporary crushing of aggregates greater than 60 tonnes per hour where the activity complies with permitted standards in E14.6.1.13, as a restricted discretionary activity under rule E14.4.1 (A94).

To assist the independent hearing commissioners if it is determined on the evidence to grant consent subject to conditions, draft recommended conditions have been included at **attachment 7**.

The reasons for this recommendation are:

1. In accordance with an assessment under ss104(1)(a) and (ab) of the RMA, the actual and potential effects from the proposal are found to be acceptable for the following reasons:
 - a) Appropriate erosion and sediment control methods will be utilised during the earthworks periods to manage sediment discharge.
 - b) The stormwater management system is of an appropriate design that will maintain water quality and ensure waterways are not subjected to high contaminant levels.
 - c) The construction works and ongoing operation of the road will not generate air quality effects that will affect health or wellbeing of surrounding residents.
 - d) Flooding outside of the designation area will not be exacerbated.
 - e) The groundwater drawdowns are not significant and will not result in settlement issues or affect existing water takes.
 - f) Provided that commensurate offsetting is undertaken, the works within the waterways will not result in ecological effects considered to be greater than minor.
2. In accordance with an assessment under s104(1)(b) of the RMA, the proposal is found to be broadly consistent with the relevant statutory documents, including the AUP:OP, the NZCPS, the HGMPA, the NES:AQ and the NES:FM.
3. In accordance with an assessment under s104(1)(c) of the RMA, relevant iwi management plans and relevant biodiversity documents have been considered.
4. In regard to Part 2 of the RMA it is considered that the application meets the relevant provisions as it enables people and communities to provide for their wellbeing through

improved roading infrastructure in a manner which can manage the adverse effects on the natural and physical resources to an acceptable degree.

5. Overall the proposal is considered to be generally consistent with the relevant objectives and policies of the AUP:OP and will provide for improved transport links between Auckland and Northland without generating an unacceptable level of adverse effects on the environment.

Warkworth to Wellsford 'Assessment of Effects on the Environment' March 2020, prepared by Karen Sinclair with the grateful assistance of Laura Laurenson, Louise Allwood, Kimberley Rolton, Julie Bevan, Shaun Hamilton, Georgia Smyth and Matt Keyse.

Warkworth to Wellsford 'Water Assessment Report' July 2019, prepared by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd and Tonkin & Taylor Ltd.

Warkworth to Wellsford 'Existing Water Quality Report' July 2019, prepared by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd and Tonkin & Taylor Ltd.

Warkworth to Wellsford 'Construction Water Management Design' July 2019, prepared by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd.

Warkworth to Wellsford 'Catchment Sediment Modelling' July 2019, prepared by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd.

Warkworth to Wellsford 'Assessment of Coastal Sediment' July 2019, prepared by Jacobs GHD Joint Venture in association with the National Institute of Water & Atmospheric Research Ltd (NIWA).

Warkworth to Wellsford 'Operational Water - Design' July 2019, prepared by Jacobs GHD Joint Venture in association with Tonkin & Taylor Ltd.

Warkworth to Wellsford 'Operational Water – Road Runoff Report' July 2019, prepared by Jacobs GHD Joint Venture in association with Tonkin & Taylor Ltd.

Warkworth to Wellsford 'Hydrological Assessment Report' July 2019, prepared by Jacobs GHD Joint Venture in association with Tonkin & Taylor Ltd.

Warkworth to Wellsford 'Flood Modelling' July 2019, prepared by Jacobs GHD Joint Venture in association with Tonkin & Taylor Ltd.

Warkworth to Wellsford 'Hydrogeology Assessment' July 2019, prepared by Jacobs GHD Joint Venture.

Warkworth to Wellsford 'Ecology Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Boffa Miskell Ltd.

Warkworth to Wellsford 'Marine Ecology and Coastal Avifauna Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Boffa Miskell Ltd.

Warkworth to Wellsford 'Construction Traffic Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Flow Transportation Specialists Ltd.

Warkworth to Wellsford 'Construction Noise and Vibration Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Chiles Ltd.

Warkworth to Wellsford 'Air Quality Assessment' July 2019, prepared by Jacobs GHD Joint Venture.

Warkworth to Wellsford 'Historic Heritage Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Clough & Associates Ltd.

Warkworth to Wellsford 'Landscape and Visual Effects Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Boffa Miskell Ltd.

Warkworth to Wellsford 'Operational Transport Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Flow Transportation Specialists Ltd.

Warkworth to Wellsford 'Operational Noise and Vibration Assessment' July 2019, prepared by Jacobs GHD Joint Venture in association with Chiles Ltd.

Warkworth to Wellsford 'Urban & Landscape Design Framework Planning Version, prepared by Boffa Miskell, June 2019, Revision 11.

Warkworth to Wellsford Project Volume 3 – Drawing Set, prepared by Jacobs GHD Joint Venture, July 2019

Section 92 response received 29/07/2020 (stormwater and industrial and trade activity, earthworks, flooding).

Section 92 response received 05/08/2020 and dated 03/08/2020 (groundwater, freshwater ecology, terrestrial ecology, landscape, traffic, heritage archaeology, heritage built).

Section 92 response received 06/08/2020 (noise and vibration).

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R-100	Proposed Designation & Indicative Alignment Plan – Sheet Layout (1:5000) – Sheet 1 of 1	07/19	0
R-101	Proposed Designation & Indicative Alignment Plan – Sheet 1 of 9	07/19	0
R-102	Proposed Designation & Indicative Alignment Plan – Sheet 2 of 9	07/19	0
R-103	Proposed Designation & Indicative Alignment Plan – Sheet 3 of 9	07/19	0
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ATTACHMENT 3

SPECIALIST REVIEWS – RESOURCE CONSENT

Stormwater Technical Memo –Specialist Unit

To:	Nicola Holmes, Principal Specialist Planning, North West Resource Consenting
CC:	Blair Masefield, Consultant Planner, Premium Project Lead
From:	Abhilasha Sharma, Senior Stormwater and Industrial & Trade Activity Specialist, Specialist Unit
Date:	10 August 2020

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Waka Kotahi – New Zealand Transport Agency
Application purpose description:	Notice of Requirement to amend the Unitary Plan and associated Regional Resource Consents to enable the construction, operation and maintenance for a new four lane state highway from Warkworth to Wellsford (Te Hana).
Relevant application numbers:	BUN60354951. The individual resource consent application numbers are: LUC60354952, LUS60354955, WAT60354953, WAT60355184, WAT 60356979, DIS60354954, LUC60355185, DIS60355186
Site address:	Multiple sites located between Warkworth and Te Hana.

2.0 ADEQUACY OF INFORMATION

The assessment below is based on the information submitted as part of the application for the diversion and discharge of stormwater and stormwater quality from impervious area associated with a high use road (namely the Warkworth to Wellsford Motorway). In particular, I, have reviewed the following documents:

- *Warkworth to Wellsford Assessment of Effects on the Environment March 2020*
- *Warkworth to Wellsford Water Assessment Report July 2019*
- *Warkworth to Wellsford Operational Water — Design Technical Report July 2019*
- *Warkworth to Wellsford Hydrological Assessment Report Technical Report July 2019*
- *Warkworth to Wellsford Proposed Draft Resource Consent Conditions May 2020*
- *Warkworth to Wellsford Proposed Draft Designation Consent Conditions May 2020*

The applicant has indicated that the final alignment for the Project will be refined and confirmed at the detailed design stage and therefore the design of the various stormwater measures have been undertaken in response to the design of the Indicative Alignment within the proposed designation boundary area. It is indicated that the stormwater measures will be subject to further design refinements at the future detailed stage. The detailed technical report within the submitted operational water design is consistent with current state of technical knowledge in this field.

It is considered that the information submitted is sufficiently comprehensive to enable the consideration of the effects of the application on an informed basis:

- a. The level of information provides a reasonable understanding of the nature and scope of the proposed activity as it relates to the AUP: OP.
- b. The extent and scale of any adverse effects on the environment are able to be assessed.

3.0 ASSESSMENT OF EFFECTS

I have reviewed the applicant's assessment of environmental effects for the operational phase in support of their application for the Warkworth to Wellsford Motorway Project (referred to as the 'Project'). I summarise this assessment below relative to two primary areas for stormwater management for the - water quality and water quantity (primarily hydrological mitigation); specifically, associated with surface runoff from the proposed impervious areas associated with the Project. It should be noted that the damming of surface water will be assessed at the future detailed design of the proposed stormwater devices (namely the proposed offline wetlands) and therefore does not form part of this assessment.

I have not provided comments on the flood hazard effects assessment of the Project as this sits predominantly with the technical assessment and reporting by Auckland Council – Healthy Waters Department.

Project Proposal:

In brief, the proposal comprises construction of a 26km long four lane dual carriageway state highway (offline from the existing State Highway 1) including three interchanges, twin bore

tunnels under Kraack Road, a series of steep cuts and fills through the forestry area within the Dome Valley (and other areas along the remainder of the Project), realignment and modification of local roads and associated works including bridges, culverts and drainage network.

The stormwater from the proposed Project (total impervious area being 198.2ha) will be managed, collected, and conveyed by roadside drains, swales or underground pipes and treated via 34 offline wetlands prior to discharge into the receiving environment. Conveyance of surface runoff from the modified local roads will be via either vegetated or rock lined swales prior to discharge into the existing streams. Cut-off drains are to be designed as either grassed or rock lined channels (on >5% steeper slopes with rock check dams) and to cater for the 100-year ARI rainfall event for the upstream catchment. The cut-off drains will be provided above cut sections and at the toe fill sections. Sediment traps are also proposed in drains at the base of rock cuttings for the capture of sediments generated from rock cuts. It is indicated that the stormwater reticulation at the road edge has not been designed as part of this phase of the project and will be assessed at the future detailed design stage, however, indicative stormwater reticulation has been included in order to inform the designation footprint required by the Project.

The project proposal and associated stormwater management approach have been developed and detailed with the Operation Water Design Technical Report (dated 2019) with consideration of the existing site characteristics and constraints and is supported by various appendices and design principles:

- *Auckland Council- Stormwater Management Devices in the Auckland Region December 2017; Guideline Document 2017/001 Version 1 (GD01).*
- *Auckland Council- Water Sensitive Design for Stormwater; March 2015 Guideline Document 2015/004 (GD04).*
- *Auckland Council Code of Practice for Land and Development and Subdivision Chapter 4- Stormwater (ASCWCoP).*
- *Auckland Regional Council (ARC) Technical Publication 10 Stormwater Management Devices: Design Guidelines Manual (TP10).*
- *Auckland Regional Council (ARC) Technical Publication 108 Guidelines for Stormwater Runoff Modelling in the Auckland Region (TP108).*

- *Stormwater Treatment Standard for State Highway Infrastructure, 2010, NZ Transport Agency.*
- *NZ Transport Agency: P46 Stormwater Specification; April 2016.*
- *Auckland Transport Code of Practice 2013 (Chapter 17- Road Drainage) (ATCoP).*

The operational water design has been developed on the principles to manage the potential effects from operational stormwater runoff due to increase in flows, volumes and contaminants as follows:

- *The design will include a range of water sensitive design solutions (in accordance with the Auckland Unitary Plan: Operative in Part (AUP(OP)) and Transport Agency standards) including treatment swales and treatment wetlands to deliver hydrology (flows and volumes) and stormwater quality (treatment) mitigation.*
- *Vegetated stormwater treatment systems are preferred over traditional “channel and pipe” approach and a best practicable option approach will be needed which recognises the range of activities and constraints of the existing environment and land use and motorway operation.*
- *Water quality treatment should be achieved through the design and construction of stormwater treatment devices, which will target the removal of suspended solids and contaminants of concern including zinc, copper and other persistent and bio-accumulative contaminants.*
- *The design will provide a best practicable option to avoid, remedy or mitigate adverse environmental effects, determined through a robust evaluation of the Project proposals in line with the NZ Transport Agency’s and Auckland Council’s requirements relating to the design and construction of stormwater conveyance and treatment systems,*
- *The design will include full consideration of and respond to the implications of stormwater management throughout the design life of the Project and will integrate the stormwater collection and conveyance networks, treatment devices, culverts and watercourse diversion and have due consideration of existing flood plains to ensure potential adverse effects relating to stormwater discharges are minimised.*

Water Quality

During the operational phase of the Project, treated stormwater road runoff will be discharged

Consent: BUN60354951. The individual resource consent application numbers are: LUC60354952, LUS60354955, WAT60354953, WAT60355184, WAT 60356979, DIS60354954, LUC60355185, DIS60355186 4
Address: Multiple sites located between Warkworth and Te Hana

to the Mahurangi Harbour via the Mahurangi River and the Kaipara Harbour via the Hotoe and Oruawharo Rivers.

The operational phase of the Project has the potential to result in changes to the water quality and may be associated with discharge of contaminants such as heavy metals, fuels and oils that are generated from vehicles, from the road carriageway and discharge of sediments from the road carriageway.

The preferred stormwater design approach for the operational phase is via 34 offline wetlands. Stormwater runoff will be collected in the Project's drainage systems, which will be conveyed via roadside drains, swales, or underground pipes to the wetlands. The long-term maintenance of the proposed stormwater devices for the motorway will remain the responsibility of the applicant. However, approval is to be sought from Auckland Transport for the proposed stormwater management for the local roads.

The range of treatment measures proposed are consistent with the current practice design as promoted through Council's GD01, GD04 and the SMAF1 hydrology mitigation requirements of the AUP(OP).

Wetlands (Offline):

The wetlands will be designed in accordance with GD01 which is based on the design of the devices to be performance based. This approach assumes that properly sized and designed devices will effectively remove contaminants (such as sediments, gross pollutants, heavy metals, oils and grease and hydrocarbons (cited from Table 15 of GD01). The applicant has provided a summary table of the preliminary wetland as part of the submitted application documents (Appendix A: Operational water phase). The construction of the proposed wetlands for each motorway chainage is consistent with the design adopted for the Northern Gateway and Puhoi to Warkworth motorway sections. The applicant is also proposing shut off valves on low level wetland outlets to contain any spilt material within the wetland in an event of a spill.

The Operational Water Design- technical report indicated that *"at this stage of the design process, we have assumed that fish passage will be required in all culverts and this will be confirmed by the Project's ecologist in future stages of the project design"*. However, as part of the proposed Resource Consent suite of conditions from the applicant (condition 84(d)), the applicant has included provision of providing fish passage in the proposed wetlands where appropriate. As part of my S92 request, the appropriateness of fish access to these offline wetlands has been raised given that the wetlands primary function is to provide treatment of

contaminants from a high use road (i.e. the proposed motorway). As part of the response by the following it is stated that:

“Fish passage to stormwater management wetlands is not required from a stormwater design perspective. However, Ian Boothroyd, the Project’s ecological expert advises that fish passage should be encouraged from an ecological perspective. Fish often access and inhabit the constructed stormwater wetlands regardless of sediment quality and without provision of specific fish passage. For example, eel populations are commonly found inhabiting constructed stormwater management wetlands in the urban environment. The requirement to provide fish passage at these locations is considered to support their ability to provide wetland habitat, increasing the potential for enhanced ecological value to be achieved.

Operation and maintenance including handling of stormwater contaminants will be undertaken in accordance with GDO1 - Stormwater Management Devices in the Auckland Region.”

GD01 recognises requirement of climbing fish access to be provided wherever a wetland is on-line to a waterway. However, the proposed wetlands are proposed as offline devices. The S92 response also does not clearly define the referred ‘urban environment’ and associated contaminant loads in comparison to the projected contaminant loads for the proposed motorway. Hence, I propose to include monitoring of levels of contaminants as a condition of consent if fish passage is being considered for the proposed wetlands and approval from Auckland Council is sought prior to implementation.

Kraak Road Tunnel Wetlands:

The Indicative Alignment has a highpoint that is within the Kraak Road tunnel, therefore the tunnel drainage will be to the nearest stormwater treatment wetlands to the north and south of the tunnel. The applicant has proposed that to manage the potential environmental effects, the stormwater management approach associated with the tunnel include:

- All normal tunnel drainage, such as tracked rainfall and groundwater, shall be treated in stormwater treatment wetland or alternative approved GD01 treatment device;
- Water collected from the tunnels that is not suitable for treatment, such as washdown water and contaminated firefighting water, shall be collected and transferred for treatment and disposal off-site. This is recommended as a condition of consent (Condition 87).

Additional components will be determined at the detailed design stage but may comprise of:

- *An inline tank to collect washdown water from tunnel cleaning. This approach was used for the Johnstones Hill Tunnel where an inline tank was formed from oversized stormwater pipes with a valve at the downstream end in the stormwater network. When the tunnel is washed the valve is closed and the washdown water is collected in the inline tank. The washdown water is pumped out of the inline tank and disposed to an off-site facility that has any necessary council approvals or consents.*
- *Containment of the fire-fighting water in the stormwater treatment wetlands. This approach was used for the Johnstones Hill Tunnel where the stormwater treatment wetlands have extra baffle height to contain any floatable materials (eg oils, petrol) and a shut-off valve for the low flow outlet from the wetland. In the event of a fire the procedure is to close the shut-off valve to contain the full volume of the fire-fighting water in the stormwater treatment wetlands. Subject to the water quality: it is discharged if of similar quality to treated stormwater; or pumped out and disposed off-site if it contains contaminants from the fire.*

It is however to also include monitoring conditions for the proposed wetlands servicing the tunnel to ensure that the water quality within the wetlands after an event of a spill meets the objective and policies of the AUP(OP) prior to discharge into the receiving environment. This is further discussed in Section 5 of this report.

Swales (for local roads):

The proposed swales (vegetated or rock lined) will be designed as best practicable option (BPO) for the contaminants of concern associated with the local roads. The proposed swales are primarily for the collection and conveyance of stormwater from the local roads, these however at some practical extent also provide treatment for removal of TSS and total copper and zinc. This is proposed as BPO because of the projected low traffic volumes and narrow road sections. The applicant has not sought approval from Auckland Transport on the proposed stormwater mitigation approach and therefore will require confirmation prior to implementation.

Sediment Traps:

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Address: Multiple sites located between Warkworth and Te Hana

The sediment traps are proposed for the Project in drains at the base of the rock cuttings that will assist in the capture of sediment generated from rock cuts. Sediment traps are being utilised as part of the Puhoi to Warkworth (P2Wk) project. This approach responds to learnings from the Northern Gateway Toll Road.

As part of the proposed Resource Consent condition 83, the applicant has suggested to also consider ‘or similar alternative devices’. As part of my S92 request, details on the ‘similar alternative devices’ was requested. In response to this request the applicant states the below:

“The words ‘similar alternative devices’ provide for future innovation in stormwater treatment to be introduced if there are suitable alternatives which are not currently in use or available. There is currently no consideration of any alternative sediment traps. Given construction is unlikely to commence for approximately 10 years there is the potential for technical advances and for practice to change during this time. The condition enables alternative devices to be utilised if available in the future and provides for the treatment of stormwater over and above the treatment devices required by the technical standard GD01 - Stormwater Management Devices in the Auckland Region. The inclusion of this provision is an additional initiative to ensure that there is opportunity to enhance the treatment of sediment derived from rock cuts. By way of example, the proposed sediment traps being utilised as part of the Puhoi to Warkworth (P2Wk) project provide extra treatment for sediment derived from rock cuts. This approach responds to learnings from the Northern Gateway Toll Road. Waka Kotahi will continue to learn from projects, specifically in relation to the performance of sediment traps. These learnings can be used by the future designers of the Warkworth to Wellsford project.”

As stated in the response given there is potential for new technical advances/practice in the future, I recommend that approval is sought from Auckland Council prior to implementation of any device(s) are included in the suite of conditions for operational water, that are not included within the Operational Water Design technical report to ensure its appropriateness to provide treatment of contaminants associated with the operational phase of the Project (new condition 85).

In respect of the water quality matters, I agree with the applicant’s position that the proposed Operational Water Design represents the best practicable option for managing stormwater quality across the project. In my view, the proposed stormwater approach is consistent with the current state of technical knowledge in this field and are appropriate to the anticipated nature of stormwater discharges relative to the sensitivity of the receiving environment.

Water Quantity:

I agree with the applicant's position that the proposed hydrology mitigation requirements equivalent to SMAF-1 overlay rules within the AUP(OP) represents the current best practice approach for managing stormwater flows and volumes in the context of the Project. This position is that where stormwater runoff from impervious area is discharged into a stream environment it must be managed in the following ways:

- Provide retention (volume reduction) of at least 5mm runoff depth for the impervious area for which hydrology mitigation is required; and
- Provide detention (temporary storage) and a drain down period of 24 hours for the difference between the predevelopment and post-development runoff volumes from the 95th percentile, 24-hour rainfall event minus the 5 mm retention volume or any greater retention volume that is achieved, over the impervious area for which hydrology mitigation is required.

This approach specifically targets small and high frequency storm events, which current knowledge (GD01) suggests are the most significant in respect of environmental consequences from stormwater diversion and discharges. The applicant has provided details within the Hydrological Assessment Report. It is noted that the wetlands will be providing detention (including retention volumes) for the 95th percentile rainfall event. Retention (i.e. volume loss via infiltration into the ground) is preferred as it contributes to the stream baseflow, however, is not provided for the proposed wetlands due to the Project geotechnical limitations and the operational/safety constraints of the Indicative Alignment. This matter was also raised by Healthy Waters as a S92 and the response to provide full detention (including retention) has been accepted by Healthy Waters Department. I accept the applicant's position that options for achieving full retention are generally limited due to site constraints.

The applicant within sub-section 4.1.5 of the Operational Design Report has indicated that the wetlands would also provide peak flow controls for the 2 -and-10- year ARI storm events at pre-development levels, however this has not been further discussed or implemented in the applicant's proposed consent conditions. The applicant has provided a detailed Flood Modelling Report addressing the proposed designation boundary overlaid across the flood extents, however, it is essential to also mitigate the local flood hazard effects of smaller

rainfall events. It is therefore, recommended to include peak flow controls for the 2 -and-10-year ARI storm events at predevelopment flow levels to be included in Condition 86 of the proposed Resource Consent conditions.

Cut-off drains:

Cut-off drains are to be provided above the cut sections and at the toe of fill sections of the Indicative Alignment to divert stormwater runoff towards the Alignment. Cut-off drains are proposed to be designed to cater for the 100-year ARI storm event for the upper catchment and discharged to either the existing streams/watercourses, or to new culverts or where not practical discharge to the road conveyance system. The cut-off drains will either be grassed or rock lined channels to prevent scour and erosion and on steeper slopes (>5%) have established rock check dams to reduce velocity within the channel.

The above is reflective in the proposed condition 82, however the requirement for check dams on slopes greater than 5% is recommended to be included in the condition.

Overall, I support the applicant's approach that the proposed management approach is appropriate and adequate to address the potential issues associated with stormwater quantity for the proposed development. However, it is recommended that the peak flow controls for 2- and 10-year ARI storm events are maintained at pre-development levels and is implemented in the design details of the proposed wetlands and is reflected in the conditions.

4.0 SUBMISSIONS

Submissions associated with water quality within the operational phase were raised by the following residents:

- JS1, David Mason and Diane McCallum- 211 Kaipara Flats, RD1
- RC20, Christine Beale and Lance Adamson- 259 Worthington Road, RD4
- RC22, Heather Jean Arnold- 253 Worthington Road, RD4
- RC23, Joanne Hawke- 263 Worthington Road, RD4
- RC34, Pauline Yarndley- 214 Kaipara Flats Road, RD1
- RC35, Dean William Yarndley- 214 Kaipara Flats Road, RD1

The following submission points were noted:

- *Concern on the diversion of a cut-off drain to an unnamed property immediately to the east of 211 Kaipara Flats Road, resulting in diverted water onto 211 Kaipara Flats Road*

(Operational Water DWG: SW-013). (JS1)

- *Clarification on the stormwater discharges in condition 80(b) of the resource consents, to be associated with Project Stormwater and Operational Water Design. (JS1)*
- *Request for an Environmental Quality Plan to ensure streams are kept in a clean condition as they lead to the Hoteo River, where water is collected for Wellsford residents. (RC20, RC22 and RC23)*
- *Provide alternative drainage of the vast amounts of contaminated flood runoff between the Dome tunnel and Kaipara Flats Road to alternative catchments i.e. not all to the Kaurawhero Stream tributary which leads down to the Hoteo. (RC34 and RC35)*

I provide the following comments to the above noted submissions (respective to the above order):

- As stated above condition 82 states that the cut-off drains will be constructed for diversion of the runoff from the upstream catchment into either streams or new culverts or where not possible, discharge to the road edge conveyance system. The section of the Operational Plan SW-013 referred in JS1 submission therefore will require to be amended to reflect what is detailed in the Operational Water Design Technical Report and Condition 82.
- Conditions under sub-heading stormwater discharges of the proposed resource conditions (Conditions 80- 100) reflect the stormwater management approach proposed for the Project at the operational phase of the Project.
- The applicant has proposed to develop a Stormwater operation and maintenance plan (SOMP, (Condition 99)). This condition ensures that the plan is in place for the ongoing maintenance of the proposed device(s), to ensure that the effects on the environment for the Project continue to be mitigated for the duration of the consent. Condition 3 also requires the SOMP to be provided 20 working days prior to the operation of the stormwater device(s) for Council's approval.
- As stated above in this technical memorandum I have recommended to include water quality monitoring of contaminants from the wetlands where fish passage is to be implemented and after an event of an accidental spills (new conditions 88 and 89).

These also include the wetlands proposed to service the tunnels prior to discharge into the receiving environment, to ensure that the objectives and policies of the AUP(OP) are met.

Wellsford Wastewater Treatment Plant

Watercare Services Limited (JS4) raised a few points in relation to the effects of constructing the motorway on the operation of the Wellsford Wastewater Treatment Plant (WWTP) which is in the Wayby Valley. The flooding effects are addressed in the Healthy Waters Department memorandum.

The below are cited from the submissions made under the sub-heading water quality (points 39 and 40) and are as following:

- *The new SH1 is expected to result in an increase in contaminants (heavy metals, fuels, oils generated by vehicles), sediments and gross pollutants (litter) being discharged into the Hōteu River. These discharges have the potential to adversely effect the quality of Watercare's water take from the Hōteu River and its provision of municipal water supply to Wellsford.*
- *Watercare seeks to maintain an interest in this aspect of the proposal and to be informed of any breaches of water quality standards disclosed through monitoring results as soon as reasonably practicable.*

The applicant as part of the design of the offline wetland(s) have proposed the inclusion of valves on the low-level outlets from wetlands, so that in the event of a spill then the valves can be closed to contain the spill material in the wetland. This is also reflected in condition 84(iii) of the proposed resource consent conditions. If an accidental spill occurs during the operational phase, it is likely that a large proportion of contaminants would be intercepted by the stormwater treatment wetlands, but some residual contaminants may be discharged to the Hōteu and Mahurangi Rivers. Notwithstanding the above, inclusion of monitoring of discharges from the proposed wetlands at the Operational phase is recommended in section 5 of this report.

The applicant in the Water Assessment Report has stated that Watercare be informed of any spills upstream of the treatment plant

5.0 CONDITIONS

I have reviewed the proposed conditions and have the following recommendations indicated in **bold** (additional text and deletions ~~strikerthrough~~):

80. The Consent Holder shall ensure that:
- a. **The stormwater devices to be implemented is to be in accordance with the Operational Water- Design Technical Report;**
 - b. All stormwater from the Project is captured, treated and discharged through offline Stormwater Management Wetlands to the extent practicable; and
 - c. All stormwater management devices and controls are designed to:
 - i. Include adaptation for 100-years of climate change;
 - ii. Provide treatment in accordance with GD01;
 - iii. Remove gross litter and floatables such as oil and volatile hydrocarbons;
 - iv. ~~Provide detention for the 95th percentile 24 hour rainfall event in accordance with GD01;~~
 - v. Provide for the conveyance of 100 year ARI event, including provision for overland flow up to and including this event; and
 - vi. Minimise changes to the water flow into the Kourawhero Wetland Complex and to maintain the pre-construction water table level to the extent practicable if located upstream of the Kourawhero Wetland Complex.

Commentary:

The above (c iv) has been removed and added into the design requirements of the wetlands in condition 86 as the design criteria proposed is only for the wetlands in the Operational Water-Design Technical Report.

81 The Consent Holder shall ensure that stormwater outfalls are designed to include erosion control to minimise the occurrence of bed scour and bank erosion at the point of discharge in accordance with TR2013/018 and GD01.

82 The Consent Holder shall ensure that cut off drains are designed to:

- a. Incorporate grassed or rock lining to prevent erosion;
- b. Shall incorporate rock check dams for slope >5%;**
- c. Provide for the 100-year ARI rainfall event for the upstream catchment and discharge to existing streams or new culverts or where not reasonably practicable discharge to the road edge conveyance system; and
- d. Minimise bed scour and bank erosion at the point of discharge.

83 *The Consent Holder shall ensure that sediment traps (or similar alternative devices) are designed to minimise sediment eroded off rock cuts entered stormwater systems.*

84 *The Consent Holder shall use pre-treatment measures where higher sediment loads are anticipated, such as sediment traps for sediment eroded off rock cuts*

85 *In the event that alternative stormwater management is proposed due to new technological advances, that will not result in an application pursuant to Section 127 of the RMA, the following information shall be provided:*

- ***Plans and drawings outlining the details of the modifications; and***
- ***Supporting information that details how the proposal does not affect the capacity or performance of the stormwater management system.***

All information shall be submitted to, and approved by the Council, prior to implementation.

Commentary:

This condition allows for modifications to be carried out on any part of the stormwater management system that has previously been assessed as part of the application and that does not require a full variation of consent. The modification may only be undertaken if it does not alter the capacity or performance of the stormwater management system negatively, change the intent of the consent or result in a change to the conditions of the consent. Information confirming the extent of the changes must be provided and the modification must be approved by the Council prior to implementation.

86 *The Consent Holder shall design Stormwater Management Wetlands to be in accordance with GD01 and shall include and not be limited to:*

- a. *Locate offline from existing Watercourses;*
- b. *Locate outside of the 100-year ARI floodplain if practicable*
- c. ***Peak flow attenuation for 2-and-10 year ARI storm events to pre-development levels***
- d. ***Provide detention for the 95th percentile 24-hour rainfall event in accordance with GD01***
- e. *Include:*
 - i. *Forebays and submerged or baffled low flow outlets so that floatables and litter can be trapped at the main outlet;*
 - ii. *Planting in emergent, littoral, riparian zones except in some areas of deep zone that are to remain plant free; and*

- iii. Valves on low-level wetland outlets to enable valves to be closed in the event of a spill to contain spilt material in wetland.
- f. Provide for climbing fish access to wetlands where appropriate, to be determined by a Suitably Qualified and Experienced Person.

Advice Note:

- a) **All Stormwater management devices should be designed to achieve the maximum infiltration achievable, and at a minimum, based on a default ground infiltration rate of 2mm/hr as suggested in GD01 – unless device-specific geotechnical constraints and operation/safety limitations prevent retention through infiltration, in which case the required detention volume shall be increased by the retention volume;**

Commentary:

The applicant within sub-section 4.1.5 of the Operational Design Report has indicated that the wetlands would also provide peak flow controls for the 2 -and-10- year ARI storm events at pre-development levels, however this has not been further discussed or implemented in the proposed consent conditions. The additional text for condition 80 sets an expectation that peak flow attenuation may be required to be incorporated into the stormwater management design.

An advice note has also been added to reflect the full detention implemented for the proposed wetlands including retention due to geotechnical constraints and safety limitations.

87 The Consent Holder shall ensure that the Project stormwater system is designed so that water can be collected from tunnels following tunnel washdown, accidental spill, or firefighting activities, and disposed of to a facility consented to receive contaminated water.

Discharge Monitoring

88 The consent holder shall develop a stormwater monitoring programme to assess the adequacy of the wetlands for fish passage and/or after an event of a spill and submit to Council for certification 20 working days prior to the commencement of the stormwater discharge. The stormwater monitoring shall include and not be limited to:

- a) **Sampling locations from the wetlands where fish passage is to be implemented;**
- b) **Methods and procedures for discharge sampling including after an event of a spill including wetlands upstream of the Watercare Treatment Plant;**

- c) **Monitoring parameters for analysis shall include:**
- **Total Suspended Solids (TSS) mg/L**
 - **Copper (total) mg/L**
 - **Zinc (total) mg/L**
 - **Total Petroleum Hydrocarbons (TPH) mg/L**
 - **Oil and grease**
 - **Temperature (where discharging to stream)**
- d) **Identified trigger levels for each of the above parameters. These trigger levels shall be developed with reference to the ANZECC Guidelines for water quality where applicable.**
- e) **The methods and procedures for investigating and reporting stormwater discharge monitoring results to Council**

89 Within 5 working days of receipt of the sample results showing contaminants exceeding the agreed trigger levels specified in the certified monitoring programme required in condition 88:

- a) **an investigation shall be undertaken to determine why exceedances were detected and to identify any additional source controls or treatment required; and**
- b) **the results of the investigation shall be provided to the Council.**

Commentary

As stated above GD01 recognises the requirement of climbing fish access to be provided wherever a wetland is on-line to a waterway. However, the proposed wetlands are proposed as offline devices. The S92 response also does not clearly define the referred 'urban environment' and associated contaminant loads in comparison to the projected contaminant loads for the proposed motorway. Hence, I propose to include monitoring of levels of contaminants as a condition of consent if fish passage is being considered for the proposed wetlands and approval from Auckland Council is sought prior to implementation. Monitoring is also to be carried out after an accidental spill including wetlands upstream of the WaterCare Treatment Plant located in the Wayby Valley.

90 The Consent Holder shall ensure that stormwater management devices associated with local roads altered by the Project convey water runoff via vegetated and/or rock lined swales adjacent to the local road prior to discharge to existing streams.

Advice Note:

Design of the proposed stormwater management devices to be agreed upon prior to construction by NZTA and Auckland Transport. Written approval from Auckland Transport to be provided to Council upon approval.

Commentary:

An advice note has been included as written approval has not been sought by Auckland Transport for the stormwater management proposed.

91 *The Consent Holder shall maintain stormwater treatment devices to ensure that the criteria in Conditions 80 to 89 of this Consent are achieved.*

Planting of stormwater management devices

92 *The Consent Holder shall prepare planting plan(s) for all planted stormwater management devices (including treatment/conveyance swales) in accordance with GD01. The planting plans shall be prepared by a Suitably Qualified and Experienced Person and shall include:*

- a. *Location, planting methodology and maintenance details;*
- b. *Details of plant species, plant numbers, density and distribution; and*
- c. *Details of proposed pest plant management.*
- d. *Details of steps taken to integrate planting with other planting required for the Project where practicable.*

Design certification – stormwater management devices

93 *The Consent Holder shall submit the final detailed design of the stormwater management devices (ie excluding conveyance measures) to the Council for certification at least 20 days prior to the start of construction of the proposed stormwater management devices. The final detailed design shall include:*

- a. *drawings;*
- b. *specification design report(s); and*
- c. *calculations and planting plans for the stormwater management devices.*

94 *If a response has not been received from the Manager within 20 Days following the provision of the final detailed design, the design shall be deemed certified and construction can commence.*

95 The Consent Holder shall carry out all permanent stormwater measures in **general** accordance with designs certified in Condition 92.

96 Stormwater management devices shall be fully operational prior to the discharge of water from any impervious area identified to discharge to each device.

As Built Plans – Stormwater management devices

97 The Consent Holder shall submit As-Built Plans for stormwater management devices to the Manager at least 20 Days prior to use of the relevant device for its intended operational purpose.

98 The As-Built Plans shall be certified by a Suitably Qualified and Experienced Person and shall include:

- a. The surveyed locations and elevations of all stormwater devices which shall be measured to the nearest 0.02 metre with co-ordinates expressed in terms of the New Zealand Transverse Mercator Projection and DOSLI datum;
- b. Stormwater management device details including locations, dimensions, volumes, flood levels, sections, treatment efficiencies, inlet, discharge rates and outlet structures;
- c. Photographs at all stormwater systems outfall locations; and
- d. Documentation of any differences between the certified design plans under Condition 93 and the As-Built Plans submitted under Condition 97.

Stormwater Operation and Maintenance Plan

99 The Consent Holder shall prepare and provide a Stormwater Operation and Maintenance Plan (SOMP) for approval from Auckland Council prior to operation of the state highway to ensure the Project stormwater management devices are maintained to achieve their design function.

100 The SOMP shall be prepared by a Suitably Qualified and Experienced Person and shall:

- a. Identify a procedure for monitoring and maintaining the Project stormwater management devices; and
- b. Include the following:
 - i. Location map and access arrangements;
 - ii. Inspection and maintenance requirements and frequency;

- iii. Routine and emergency contacts; and
- iv. As-built drawings and stormwater system information.

6.0 OBJECTIVES AND POLICIES

The following provisions of the AUP - OP relate to the management of stormwater.

- Objectives – E1.2.(1)-(3)
- Policies - E1.3. (1)-(15)

The proposed stormwater management will achieve the above objectives through the proposed stormwater management system. It is assessed that the proposed stormwater management is the Best Practicable Option for the site. The selected stormwater management devices are in accordance with the outcomes of integrated stormwater management.

The following general objectives and policies and overlay policies of the plan may also be relevant to the planner's assessment of the application:

- Chapter B7 Natural Resources

Other statutory documents

The following statutory documents are also relevant to the diversion and discharge of stormwater:

- National Policy Statement: Freshwater Management 2014
- New Zealand Coastal Policy Statement 2010

7.0 RECOMMENDATION

The assessment in this memo does not identify any reasons to withhold consent, and the aspect of the proposal considered by this memo could be granted consent, subject to recommended conditions, for the following reasons:


- The applicant has indicated that the final alignment for the Project will be refined and confirmed at the detailed design stage and therefore the design of the various stormwater measures have been undertaken in response to the design of the Indicative Alignment within the proposed designation boundary area. It is indicated that the stormwater measures will be subject to further design refinements at the future detailed stage.

- The applicant has provided a suite of stormwater management approaches that are consistent with the current state of knowledge in this field and is considered appropriate in the context of the development and the anticipated contaminants such that the effects of stormwater discharging to the receiving environment will be suitably mitigated.
- Subject to the imposition of the consent conditions the proposal is not inconsistent with the stormwater management related objectives and policies in the Auckland Unitary Plan (AUP(OP)).
- Subject to the imposition of the consent conditions and the edits to the conditions recommended in section 5, it is considered that the proposed stormwater management system is appropriate and adequate to address the potential issues associated with stormwater quality and quantity for the proposed development.

8.0 REVIEW

Memo prepared by:

Abhilasha Sharma



Senior Specialist, Stormwater and Industrial & Trade Activities
Specialist Unit, Resource Consents

Date:

10 August 2020

Memo and technical review reviewed and approved for release by:

Rod Dissmeyer



Team Leader Stormwater, Wastewater and Industrial Trade Activities
Specialist Unit, Resource Consents

Date:

11/8/2020

Technical Memo –Specialist Unit

To:	Wayne Siu, Warkworth to Wellsford Notice of Requirement Planner
CC:	Iresh Jayawardena, Healthy Waters Specialist Ken Tomkins, Senior Healthy Waters Specialist Alison Bodmer, Healthy Waters Engineer Blair Masefield, Auckland Council Project Manager
From:	Trent Sunich, Consultant Planner, 4Sight Consulting
Date:	12 August 2020

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Waka Kotahi – New Zealand Transport Agency
Application purpose description:	Notice of Requirement to amend the Unitary Plan and associated Regional Resource Consents to enable the construction, operation and maintenance for a new four lane state highway from Warkworth to Wellsford (Te Hana).
Relevant application numbers:	BUN60354951. The individual resource consent application numbers are: LUC60354952, LUS60354955, WAT60354953, WAT60355184, WAT 60356979, DIS60354954, LUC60355185, DIS60355186
Site address:	Multiple sites located between Warkworth and Te Hana.

2.0 ADEQUACY OF INFORMATION

The assessment below is based on the information submitted as part of the application. I have reviewed the following documents:

- Warkworth to Wellsford Assessment of Effects on the Environment March 2020
- Warkworth to Wellsford Water Assessment Report July 2019
- Warkworth to Wellsford Operational Water — Design Technical Report July 2019
- Warkworth to Wellsford Flood Modelling Technical Report July 2019
- Warkworth to Wellsford Hydrological Assessment Report Technical Report July 2019
- Warkworth to Wellsford Proposed Draft Resource Consent Conditions May 2020
- Warkworth to Wellsford Proposed Draft Designation Consent Conditions May 2020

It is considered that the information submitted is sufficiently comprehensive to enable the consideration of the effects of the application on an informed basis:

- a. The level of information provides a reasonable understanding of the nature and scope of the proposed activity as it relates to the AUP: OP.
- b. The extent and scale of any adverse effects on the environment are able to be assessed.

3.0 ASSESSMENT OF EFFECTS

This memorandum summarises the findings from the Healthy Waters review of the Warkworth to Wellsford Motorway project (the Project). I note the review focuses on the flood hazard effects assessment of the project forming part of Healthy Waters' role in the region as being responsible for flood protection and control¹ and includes input from Healthy Waters specialists who have reviewed the flood hazard modelling undertaken by the applicant's engineering consultants.

Where appropriate I have also commented on management of operational stormwater discharges from the project, however this predominantly sits with the technical assessment of the stormwater diversion and discharge consent and reporting by Abby Sharma of the Specialist Unit in the Auckland Council.

Motorway proposal

In brief the proposal comprises the construction of a four-lane motorway using earthworks cut and fill techniques to form the carriageway and excavation to construct the tunnels through Dome Valley. The motorway will be served by drainage infrastructure owned and operated by the applicant generally comprising formed open drains and swales, stream diversions, piped reticulation, culverts and water quality treatment/detention wetlands serving each subcatchment. No stormwater management infrastructure is proposed to be vested to the Auckland Council or Auckland Transport.

Several technical documents/guidelines have been used by applicant to develop the proposal and will form the basis for detailed design should be resource consents and Notice of Requirement (NOR) be granted. The key documents are listed as follows:

- Auckland Council — Stormwater Management Devices in the Auckland Region; December 2017; Guideline Document 2017/001 Version 1 (GD01).

¹ Auckland Council Stormwater Asset Management Plan: 2015-2045

- Auckland Council – Stormwater management devices: Design guideline manual; May 2003, Second Edition; Technical Publication 10.
- Auckland Council Code of Practice for Land Development and Subdivision Chapter 4 — Stormwater (ACSWCoP).
- ARC, Technical Publication 108 Guidelines for Stormwater Runoff Modelling in the Auckland Region (TP108).
- Stormwater Treatment Standard for State Highway Infrastructure, 2010, NZ Transport Agency.
- NZ Transport Agency: Bridge Manual (Bridge Manual) 3rd edition (SP/M/022—2013).
- NZ Transport Agency: P46 Stormwater Specification; April 2016.
- NZ Transport Agency: TNZ Highway Surface Drainage: A Design Guide for Highways with a Positive Collection, 1977.

Flood hazard modelling

The motorway generally has a north/south orientation and is predominantly located in the Hotoe River and Mahurangi River catchments and terminates north of Wellsford through the Oruahwero Catchment (Te Hana Creek and Maeneene Creek catchments). The proposed motorway alignment results in several stream crossings involving permanent reclamation, stream diversion, stream culverting and associated displacement of existing floodplain flood storage.

In order to understand current flood hazard areas and inform areas of further investigation and the preliminary design, the applicant initially used the Auckland Council's Rapid Flood Hazard Assessment (RFHA) maps with the proposed designation boundary overlaid across the flood extents. This approach identified the three key locations requiring further flood hazard modelling:

- Mahurangi River and its tributaries crossings.
- Kourawhero Stream (an upper catchment of the Hotoe River) south of the proposed tunnel entry/exit portal.
- Wayby Valley, north branch of the Hotoe River.

For the Mahurangi River, flood models undertaken by third parties were assessed and, as far as possible, adapted for use on the project. For the Hotoe River subcatchments, new models were developed for assessment of the project. At each location, the floods of 2, 10, 20 and

100 Year ARI rainfall events were adopted, with an allowance for climate change to 2130 consistent with Ministry for the Environment (MfE) guidance².

In assessing this approach, Healthy Waters agrees that the screening method used to focus on the three key locations is suitable and avoids unnecessary flood hazard modelling of the entire motorway alignment. This is framed by the caveat that further modelling will be undertaken during detailed design as is anticipated through the draft conditions of consent.

Secondly, it is agreed that in many instances the use of Rapid Flood Hazard Analysis (RFHA) models and maps can provide useful background and cross-check information when assessing the quantum of positive and negative flood hazard effects (flood extent footprint and depth of inundation) that the proposed motorway and its bridges and culverts may have on upstream or downstream catchments.

Healthy Waters specialists assessed the model development methods discussed in the Flood Modelling Technical Report and determined there were no significant flaws in how the model results were derived or reported at this stage of the project design. Further, the information supplied was suitable to understand the quantum of flood hazard effects (adverse and positive), albeit being based on preliminary design and alignment of the proposed motorway. This conclusion was reached on the basis that further detailed analysis would be carried out during the detailed design phase should the notice of requirement and resource consents be granted, a matter acknowledged by the applicant in the Flood Modelling Technical Report³:

'The hydrological and hydraulic modelling approaches for the Hotoe, Kourawhero and Mahurangi all have limitations as described previously. The modelling approaches are suitable for assessing the effects of the Project and Indicative Alignment at this stage of design detail. However, they will need to be refined for detailed design'

It is noted that during the initial assessment phase using the RFHA maps, the Maeneene and Te Hana stream catchments of the Oruahero Catchment were screened out of requiring further modelling and assessment. In their Section 92 response, the applicant stated this was due to the minimal interactions the proposed alignment has with these catchments and the corresponding risk of adverse flood effects being low. Notwithstanding this, it is anticipated any exacerbation of flood hazard along the entire motorway alignment will be addressed by the consent conditions during detailed design phase of the project. The draft flooding related

² Climate Change Projections for New Zealand: Atmosphere Projections Based on Simulations from the IPCC Fifth Assessment

³ Section 6, Flood Modelling Limitations

conditions are as follows:

- 99 *The Consent Holder shall ensure that the design of the Project does not result in an increase in the 100 year ARI flooding levels greater than 100mm vertically outside the Designation. Compliance with this Condition shall be demonstrated by a hydraulic and hydrological model with the level of detail and reporting to be agreed with the Manager. The peak flood levels and flood flows for pre-development and post-development of the Project shall be compared upstream and downstream at the Designation boundary.*
- 100 *The Consent Holder shall demonstrate that any headwater ponding upstream of any Project culvert in the 100 year ARI event is contained within either:*
- a. *Land within the Designation at the time of construction; or*
 - b. *An existing floodplain.*

Flood hazard effects on properties

The applicant has assessed the effects of the proposal on properties upstream and downstream of the proposed motorway alignment at the three key locations (Mahurangi River, Kourawhero Stream, Wayby Valley) and is discussed below. Where applicable the reporting from the flood modelling results also accounts for proposed ecological and landscape mitigation planting which has the potential to influence how floodplains will operate such as by slowing flood flows.

Flood hazard has the potential to be exacerbated through change in flood storage due to the construction of road embankments and changes in conveyance due to culverts, bridges and diversions of both streams and flood plains. It is noted there are several existing dwellings within the designation boundary which are subject to flooding increase of up to 1.0 m however the applicant has indicated that any dwelling subject to increased flood risk within the proposed designation will be purchased by the Crown before construction should the NOR and resource consents be approved. It is unclear what the long-term plan is for these dwellings, including if they are on sold should parts of the designation (to be determined later) be removed as is indicated by the applicant⁴. Draft consent condition 99 currently focuses on flood hazard effects outside the designation (subject to the performance requirements) and subsequently there is limited scope to mitigate flood hazards to habitable floors levels (as a result of constructing the motorway) in the event areas of the designation are removed. In this regard an edit to draft condition 99 is recommended and is discussed further in Section 5.

Mahurangi River

⁴ Section 1.4.1, Assessment of Effects on the Environment

The floodplain in the lower section of the Mahurangi River catchment for the 100 year ARI rainfall event extends into some areas of Warkworth across farmland and inundates local roads including Woodcocks Road and Curran Road (within the proposed designation) and Kaipara Flats Road east of the proposed designation.

Reporting by the applicant on the flood hazard model results indicates negligible flooding difference between the pre and post development scenarios and this is agreed when viewing the various figures and tables in the Water Assessment Report indicating changes in flood levels for the 100 Year ARI rainfall event. This includes the impact of proposed planting within the Mahurangi River where flood level increases of up to 0.1 m are viewed to be insignificant in the context of a predevelopment flood depth of over 1.5 m.

There are some areas of flood level increase of up to 1.8 m (upstream of the culverts) and up to 1.0 m (left branch of the Mahurangi upstream of Bridges 5 and 6), however in both cases this is within the proposed designation and is within pasture or is contained within riparian areas.

The flood hazard modelling indicates no increase in flood level to dwellings outside the designation however this should be viewed in the context of further design detail to be completed prior to construction that may influence floodplain hydrology. This emphasises the importance of the draft resource consent conditions which are performance based where, for example, Section 2.5.1 of the Flood Hazard Report 'Proposed Bridges Across the Mahurangi River' states:

'Bridge No. 5 and Bridge No. 6 have indicative spans of 65.0 m and 110.0 m respectively, with the bridge span and crest level based on road geometrics rather than by flood hydraulics. At the detailed design stage, a bridge with smaller dimensions could increase flood levels, but these effects may be able to be contained within the designation or be within acceptable levels. The requirements for detailed design of bridges and culverts are best informed by performance-based resource consent conditions'

Kourahwero Stream

The Kourahwero Stream is a tributary of the Hoteo River. It initially flows southward from the motorway tunnel down to Kaipara Flats Road and then flows to the west and contributes to the frequent surface flooding of the road carriageway and nearby properties. RFHA mapping indicates current flood depths of up to 1.0 m for the 100 year ARI rainfall event.

The applicant's flood hazard modelling of the Kourawhero Stream indicates increase in flood

levels as a result of constructing the culverts (up to 2.0 m increase) and carrying out earthworks within the flood plain (up to 1.0m increase). The earthworks activity indicates three dwellings (11, 18 and 30 Phillips Road) will be impacted by increased flood depth and given these dwellings are each within the designation, the applicant has indicated they are likely to be purchased by the Crown prior to construction.

The Kaipara Flats Road carriageway is currently subject to flooding however applicant's flood hazard modelling for the 100 year ARI rainfall event indicates this is not predicted to be exacerbated post development, including as a result of the proposed mitigation planting which is confined to within the designation boundary. It is noted the flood hazard modelling completed by the applicant does not include the influence of impervious areas proposed post construction (i.e. the motorway carriageway). This matter is discussed further below in relation to operational stormwater discharges.

Wayby Valley

The existing floodplain through Wayby Valley for the 100 year ARI rainfall event is characterised by the northern branch of the Hotoe River flowing through flat to rolling farmland which also includes the existing Wellsford Wastewater Treatment Plant to the west of Wayby Valley Road operated by Watercare.

Flood hazard modelling post development does not indicate significant change in terms of the extend of flood inundation, however there is a flood depth increase north of Rustybrook Road of over 2.0 m within the designation and up to 0.6 m immediately outside the designation. Both areas are currently in pasture and notably pre-development flood levels are up to 1.0 m. As will be the case with other areas with increased flood hazard along the project alignment, the applicant is proposing detailed design measures such as diversion channels to decrease the depth of flooding prior to construction.

Increases in flood depth are also observed in the flood hazard modelling of up to 0.1 m outside the designation at the junction of Rustybrook Road and Wayby Valley Road, and north of the interchange with State Highway 1 and Wayby Valley Road.

Flood hazard modelling to gauge the influence of mitigation plating immediately upstream of the viaduct at Wayby Valley (and beyond the designation boundary) indicates an increase of 0.15 m however the applicant provides context text to this increase given the predevelopment flood depth during a 100 year ARI rainfall event is currently over 2.5 m. Further, the applicant states the increase in flood depth does not directly affect any existing dwellings.

At the time of writing no carriageway levels have been given on the Preliminary Drawings. It is quite possible that further modelling will be required in the lower Wayby Valley area to confirm the freeboard of the motorway from flooding, and also that there is no increase in flood level at the Wellsford Wastewater Treatment Plant.

Flood hazard protection of the motorway

The applicant has designed the carriageway level to be set above the post development flood levels for the 100 year ARI rainfall event with a freeboard of 0.5 m for the carriageway road level and 1.0 m at each culvert crossing for each of the three key locations being the Mahurangi River, Kourahwero Stream and Wayby Valley (Hoteo River) floodplains. This includes allowance for climate change to the end of the design life for the project at year 2130. It is noted this freeboard will also apply to the entire project alignment and the applicant states the improved public safety level of service relative to the flood resilience of the existing State Highway 1.

Operational stormwater management and stormwater discharges

Management of stormwater discharges from the motorway alignment are assessed in the technical memorandum by Abby Sharma given the activity is regulated by the E8 chapter of the Auckland Unitary Plan. Notwithstanding that assessment, the stormwater management system proposed for the project generally meets good practice by providing water quality treatment and detention (hydrology mitigation) in accordance with the Auckland Council's stormwater management guideline documents⁵. This is through the construction of stormwater management wetlands for each motorway sub catchment consistent with the design adopted for the Northern Gateway and Puhoi to Warkworth motorway sections. In addition to the treatment of vehicle borne contaminants (zinc and copper) and total suspended solids (TSS), the wetlands also provide for the removal of gross litter and floatables such as oil and volatile hydrocarbons.

It is noted that the wetlands are providing detention (hydrology mitigation) for the full 95thile rainfall event including the retention component of 5mm. Typically retention (i.e. soakage of stormwater runoff into the ground) is preferred throughout the region to assist with contribution to stream baseflow (and maintenance of stream habitat), however this is not being proposed for this project. This matter was raised by Healthy Waters as a Section 92 question and the applicant responded citing unfavourable geotechnical and soil conditions with low permeability.

⁵ Auckland Council — Stormwater Management Devices in the Auckland Region; December 2017; Guideline Document 2017/001 Version 1 (GD01). Auckland Council – Stormwater management devices: Design guideline manual; May 2003, Second Edition; Technical Publication 10

The applicant also noted the passive water stormwater management characteristics of wetlands (minimising maintenance frequency) and associated health and safety aspects of limiting work at the roadside. This response is accepted by Healthy Waters citing the alternative hydrology mitigation pathway stipulated in the Auckland Unitary Plan where full retention is not able to be achieved⁶.

The design of the stormwater management wetlands and the flood hazard modelling assessment completed by the applicant did not include allowance stormwater runoff from impervious surfaces which typically results in increased stormwater flow rates and volume when development shifts from vegetated to impervious. Measures to mitigate this can include attenuation and storage of stormwater runoff to match predevelopment flow levels. The applicant has cited the post development impervious surfaces are small compared to the overall catchment areas (0.4% each for the Mahurangi and Hotoe River catchments) and therefore will not contribute significantly to catchment scale flooding. Notwithstanding this, in response to the s92 question raised by Healthy Waters, the applicant indicated the project impervious areas will be included in the flood hazard modelling associated with the detailed design of the motorway alignment (addressed through draft Condition 99) and thus any resulting mitigation such as sub catchment specific stormwater attenuation would be captured at that time. It may also be necessary to mitigate the local flood hazard effects of smaller rainfall events (e.g. 2 to 5 Year ARI rainfall events) in areas currently at risk such as the headwaters of the Kourawhero Stream flowing into the Kaipara Flats Road area. For example, there is approximately 2 km of carriageway imperviousness discharging to wetlands at CH47300 and CH46500 where the rate of runoff is expected to sharply increase with no peak flow attenuation (i.e. post development flow rates matching predevelopment) currently proposed. This matter is discussed further in Section 5.0 below.

4.0 SUBMISSIONS

Local Flooding

Reflective of the flooding associated with the Kourawhero Stream and the Mahurangi River, submissions were raised by the following residents as to whether construction of the project would exacerbate existing flood risk to properties, dwellings and roads:

- JS1, David Mason and Dianne McCallum
- RC31, Dianne Civil
- RC34, Pauline Yarndley 214 Kaipara Flats Road
- RC35, Dean William Yarndley 214 Kaipara Flats Road

⁶ Table E10.6.3.1.1 Hydrology mitigation requirements

The following submission points were noted:

- Concern that existing depleted wetland /flood plain areas are being utilised for fill sites without regard to the potential for these areas on downstream flooding but also for offset areas to restore rather than add to the depletion of wetlands more than is necessary (JS1).
- The design will also cause an increase in flooding on local roads and properties, causing damage to roading, bridges and houses located in this area (RC31).
- Increased flood depth of what it already does represents a huge actual volume – affecting not only our immediate area but of course downstream through the very flat valley bottom to Kaipara Flats (RC34).
- There will be increased flooding on Kaipara Flats Road all the way to Kaipara Flats Village. There is no reason to put two culverts into the Kaipara Flat Road just before 214 Kaipara to create more flooding for us (RC35).

As was discussed above, significant exacerbation of flood risk is largely confined to properties within the designation. Notwithstanding this, although the applicant has assessed adverse effects will be limited, there is the potential for local affects to be exacerbated and will subsequently be addressed through detailed design in accordance with the performance requirements outlined in draft conditions 99 and 100. Refinements to draft condition 99 is also discussed in Section 5.

Wellsford Wastewater Treatment Plant

Watercare Services Limited (JS4) raised several points in relation to the effects of constructing the motorway on the operation of the Wellsford Wastewater Treatment Plant (WWTP) which is located in the Wayby Valley. A summary of the submission is as follows:

- A small change in flood levels could result in significant adverse effects. For example, any flooding at the site could lead to the dam failing and spilling sludge and wastewater down the Hoteo River, resulting in adverse environmental and cultural environmental effects, as well as implications on Watercare's surface water take.
- There is a large degree of uncertainty as to the future Average Recurrence Interval (ARI) of flooding as a result of climate change. Given the indefinite lifespan of the new SH1, Watercare cannot be confident that the proposed conditions which relate to current ARI levels will avoid an increase in flood hazard risk at the Hoteo River floodplain.
- Watercare is in the process of designing an upgrade to the WWTP. This upgraded plant is proposed to be sited on higher ground. Watercare insists that it be informed on and consulted on any changes to the floodplain levels and flood velocities proposed by the applicant, in order to ensure they are allowed for in any new Watercare infrastructure.

A review of the Auckland Council RFHA map in Wayby Valley indicates the Wellsford WWTP plant is currently at risk during the 100 year ARI rainfall event, however when compared to the applicant's flood hazard modelling in the vicinity of the WWTP (west of the proposed motorway alignment), there does not appear to be an increase in flood level adjacent to the existing WWTP pond⁷. Notwithstanding this, it is valid to understand the flood hazard during detailed design of the motorway alignment in relation to the existing plant and any future plant construction. This is captured by draft Condition 99 in the capacity of the Manager reviewing the design or authorised delegate⁸. (Please also see comments in Section 3.0 Assessment of Effects – "Wayby Valley" above.)

Regarding the influence of climate change, it is acknowledged there is inherent uncertainty in making predictions as to future rainfall and temperature patterns and its influence on infrastructure design and construction. However as is discussed in Section 1.6 of the Flood Modelling Report the effects of climate change were considered for 100 years post road construction, (i.e. approximately 2130) using the following method.

- Evaluation of projected changes in seasonal and annual mean temperature from baseline to 2130.
- Evaluation of projected changes in extreme rainfall based on the projected changes in temperature from baseline to 2130.
- Evaluation of projected changes in flood magnitude based on the projected changes in extreme rainfall from baseline to 2130.

On balance, this method is considered the best use of the information that is available and will form the basis of further detailed design modelling required by draft condition 99. This method also references and utilises the established MfE climate change design literature being:

- MfE (2010): Tools for Estimating the Effects of Climate Change on Flood Flows: A guide for local government in New Zealand.
- MfE (2016): Climate Change Projections for New Zealand: Atmosphere Projections Based on Simulations from the IPCC Fifth Assessment.

5.0 CONDITIONS

I have reviewed the proposed conditions and have the following recommendations indicated in **bold** (additional text).

⁷ Figure 37 Water Assessment Report Volume 2.

⁸ Definition of Manager: The Manager – Resource Consents, of Auckland Council, or authorised delegate

Condition 80:

The Consent Holder shall ensure that:

- a. *All stormwater from the Project is captured, treated and discharged through offline Stormwater Management Wetlands to the extent practicable; and*
- b. *All stormwater management devices and controls are designed to:*
 - i. *Include adaptation for 100-years of climate change **up to year 2130**;*
 - ii. *Provide treatment in accordance with GD01;*
 - iii. *Remove gross litter and floatables such as oil and volatile hydrocarbons;*
 - iv. *Provide detention for the 95th percentile 24 hour rainfall event in accordance with GD01*
 - v. ***Provide peak flow attenuation for rainfall events up to 2 year ARI in accordance with the performance criteria in Condition 99;***
 - vi. *Provide for the conveyance of 100 year ARI event, including provision for overland flow up to and including this event; and*
 - vii. *Minimise changes to the water flow into the Kourawhero Wetland Complex and to maintain the pre-construction water table level to the extent practicable if located upstream of the Kourawhero Wetland Complex.*

Commentary:

This addition to Condition 80 is recommended given although the impervious areas of the motorway will be a fraction of the overall catchment areas (0.4 % each for the Mahurangi and Hotoe River catchments), local flood events may become evident during detailed design and further modelling. This is not able to be assessed at this time given impervious areas of the project have not been included in the preliminary flood hazard modelling completed by the applicant. The additional text for condition 80 sets an expectation that peak flow attenuation may be required to be incorporated into the stormwater management design and also responds to concerns raised in the submissions regarding local flooding.

Condition 99:

The Consent Holder shall ensure that:

- a. *The design of the Project does not result in an increase in the 100 year ARI flooding levels greater than 100mm vertically outside the Designation **or create a flood risk to any habitable floor, including within the Designation.***
- b. ***The design of the project does not increase the frequency of flooding for rainfall events up to the 2 year ARI***

Compliance with this Condition shall be demonstrated by a hydraulic and hydrological model with the level of detail and reporting to be agreed with the Manager. The peak flood levels and flood flows for pre-development and post-development of the Project shall be compared upstream and downstream at the Designation boundary.

Commentary:

The condition focuses on the 100 year ARI event which is appropriate to assessing flood hazard risk associated with the proposed motorway alignment, however given the relatively large surface area of the floodplains, post development flood height differences may be

minimal. The purpose of this recommended additional text to condition 99 is to capture potential adverse effects of smaller and frequent rainfall events exacerbating existing flood risk such as the Kourahwero Stream flooding in the Kaipara Flats Road area and provides a mitigation pathway through the text addition recommended in draft condition 80. The additional text relating to the creation of flood risk in relation to habitable floor levels reflects earlier comments regarding the long term uncertainty of dwellings which are indicated to be at flood risk as a result of constructing the motorway.

6.0 OBJECTIVES AND POLICIES

The natural hazards and flooding related Auckland Unitary Plan objectives and policies relevant to the proposal are listed as follows:

B10 Environmental Risk:

B10.2.1 Objectives (3), (4) and (6).

B10.2.2 Policies (1), (3), (4), (5), (7) (8) (11) and (12).

E36 Natural Hazards and Flooding:

E36.2 Objectives (1), (2) and (4).

E36.2 Policies (1), (2), (4), (18), (20), (21), (23), (27), (29), (30) and (35).

The applicant has identified and assessed current and future flood risk associated with the project and has sought to incorporate the influence of climate change projections to year 2130 consistent with Policy B10.2.2. Although limitations in the flood hazard modelling are acknowledged (being based on preliminary motorway design), the quantum of flood hazard changes are able to be assessed and are generally limited to being within the designation boundary. Further assessment is required during detailed design of the motorway where suitable performance requirement will need to be met as conditions of consent contributing to overall consistency with the B10 and E36 objectives and policies.

7.0 RECOMMENDATION

The assessment in this memo does not identify any reasons to withhold consent or the NOR. The flood hazard effects of the proposal considered by this memo that could be granted subject to recommended conditions, are for the following reasons:

- The applicant has used their own preliminary stormwater modelling as well as the Auckland Council's Regional Flood Hazard Analysis models and flood-maps to identify areas of risk along the alignment and will undertake future detailed modelling of those risk areas to understand post construction changes in flood depth and flood extent.
- The flood hazard modelling accounts for the effects of climate change by adjusting for changes in temperature and rainfall patterns in accordance with MfE guidance.
- The flood hazard modelling and reporting of the results is suitable to inform the quantum

of flood hazard effects, indicating exacerbation of flood risk is predominantly within the designation boundary or will be mitigated outside the designation through the performance related draft conditions. The applicant has acknowledged the limitations being reported in the context of preliminary design of the project and therefore proposes further flood hazard modelling of the detailed design in accordance with flooding related consent conditions and associated performance criteria.

- Subject to the imposition of consent conditions the proposal is not inconsistent with the flood hazard related objectives and policies in the Auckland Unitary Plan.
- Subject to the imposition of consent conditions and the edits to the conditions recommended in Section 5, it is considered that the any exacerbation of flood hazard as a result of constructing the motorway will be minor.

8.0 REVIEW

Memo reviewed by:

Dean Yee, Resource Management Team Manager (Acting)
Healthy Waters Department, Auckland Council

Date:

13 August 2020

Technical Memo –Specialist Unit

To:	Nicola Holmes, Principal Specialist-Planning
CC:	Blair Masefield, Project Manager
From:	Kala Sivaguru, Senior Specialist-Coastal
Date:	27 August 2020

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Waka Kotahi – New Zealand Transport Agency (NZTA)
Application purpose description:	Construction, operation and maintenance for a new four lane state highway from Warkworth to Wellsford (Te Hana).
Relevant application numbers:	BUN60354951, DIS60354954
Site address:	Multiple sites located between Warkworth and Wellsford.

2.0 ADEQUACY OF INFORMATION

NZTA is seeking resource consent for the second stage of Puhoi to Wellsford project covering the SH1 corridor from the Northern Gateway Toll Road at the Johnstone's Hill tunnels, to Wellsford. The Project involves the construction, operation and maintenance of a new four lane state highway, ~ 26km in length. The project commences at the interface with P2Wk (Puhoi to Warkworth Project) near Wyllie Road and passes to the west of the existing SH1 alignment near The Dome, before crossing SH1 just south of the Hoteo River.

The AEE is based on an indicative alignment and indicative construction methodology. The AEE states that the timing for construction of the Project is not certain, the assumed construction start date is 2030.

This technical memo assesses the potential marine ecological effects including avifauna from the Project on Mahurangi Harbour and Kaipara Harbour being the ultimate marine receiving environment of the Project sediment discharges.

The assessment below is based on the information submitted as part of the application. In particular, I have reviewed the following documents:

- Warkworth to Wellsford: Assessment of effects on the environment, dated March 2020

- Warkworth to Wellsford: Marine ecology and coastal avifauna assessment, dated July 2019
- Warkworth to Wellsford: Assessment of coastal sediment, dated July 2019
- Warkworth to Wellsford: Water Assessment Report, dated July 2019
- Forest and Bird Submission (JS3)
- Department of Conservation Submission (JS7)

It is considered that the information submitted is sufficiently comprehensive to enable the consideration of the effects of the application on an informed basis:

- a. The level of information provides a reasonable understanding of the nature and scope of the proposed activity as it relates to the AUP: OP.
- b. The extent and scale of any adverse effects on the environment are able to be assessed.

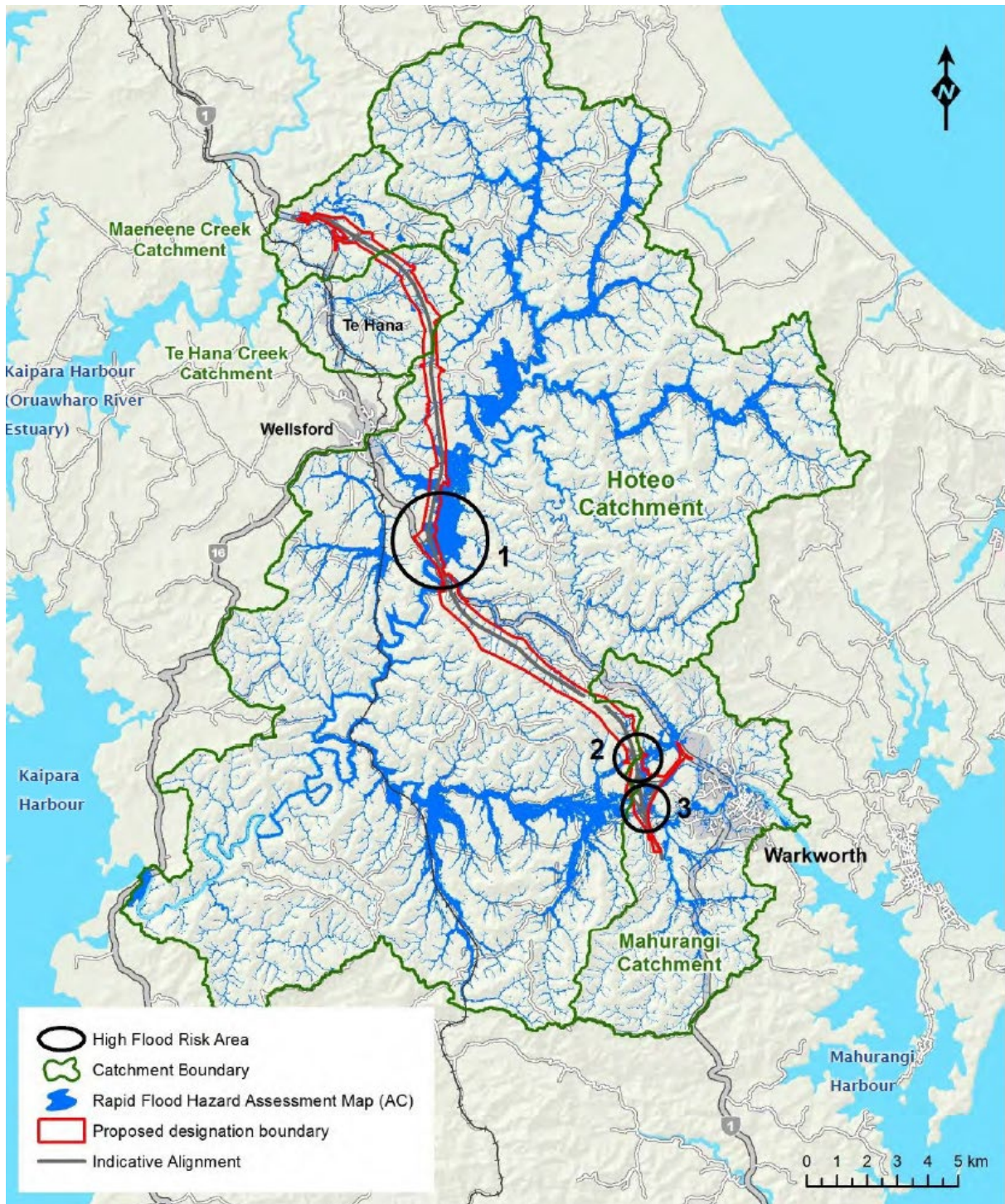


Figure 1: Indicative alignment of the Project and major catchments

The Project does not pass through any CMAs. At its closest point the project is located ~ 1km upstream of the CMA at the northern tie-in with the existing SH1. The CMA in the surrounding area includes the Mahurangi Harbour and the coastal reaches of the inner Kaipara Harbour inlets at Te Hana Creek and Maeneene Stream. These harbours are the ultimate receiving environment for discharges from the Project.

Mahurangi Harbour

A large area within the Mahurangi Harbour is classified as SEA-M2, and some smaller areas as SEA-M1 in the AUP (OIP).

The main body of the harbour is SEA-M2 (76a) and the mouth of the Mahurangi River, Hamiltons Landing and Te Kapa River, (76 b-j, p), Dryers Creek (76f) plus adjacent to the headland at Cudlip Point (76k) and Big Bay (76l) and Saddle Island (76l) are recognised as SEA-M1. These areas include wading bird habitats (SEA-M2w-76w1, 76w2 which are recognised as intertidal feeding habitat for waders.

Other regional ecological values

DOC has recognised almost the entire Mahurangi Harbour as an Area of Significant Conservation Value (DOC, 1994). The harbour contains a diversity of coastal habitat zones including rocky shorelines, sandy beaches, extensive mudflats, mangroves, saltmarsh and adjacent coastal forest. The area is regionally important for the collection of oyster spat.”

Kaipara Harbour

The Kaipara Harbour is the largest harbour in the Auckland Region (947km², of which 407km² is intertidal). The harbour has a number of SEA-M1 and SEA-M2 areas including significant wading bird areas. The closest areas of CMA to the Project area include the intertidal area around Te Hana Creek, and Maeneene Stream.

The Harbour has a number of SEA-M1 & SEA-M2 including wading bird habitats. The edges of the Hoteo Inlet, adjacent to the main channel is identified as SEA-M2 (5b) and the mouth of the Hoteo River is SEA-M1 (3a).

Other regional ecological values

North Kaipara Harbour has been identified as a significant ecological area for marine ecology under the notified Northland Regional Plan (notified 6 September 2017), with an ecological value ranking of high.

3.0 ASSESSMENT OF EFFECTS

3.1 Rules and standards:

There are no RMA s12 (Coastal Permit) related reasons for consent for this application. With regards to sediment discharge to the harbours it is a permitted activity¹ in the AUP (OIP) on the following basis.

Under Table E11.4.2, Rule (A14) “*The temporary diversion and damming of surface water and the discharge of treated sediment laden water from any land disturbance allowed by a land use consent in the above tables*”, is a Permitted activity, subject to achieving the relevant General Standards.

The relevant General Standards are found in E11.6.2 which states that all activities listed as a permitted activity in Table E11.4.2 must comply with permitted activity standards, including:

¹ as advised by internal Auckland Council Principal Specialist planners

(1) Land disturbance must not, after reasonable mixing, result in any of the following effects in receiving waters:

(e) any significant adverse effects on aquatic life.

I also note General Standard E11.6.2(2) which requires best practice erosion and sediment control measures must be implemented for the duration of the land disturbance. I rely on the opinions of Mr Byrne, Auckland Councils Erosion and Sediment Control expert, that best practice measures are proposed and will be implemented via the proposed conditions of consent.

3.2 Technical assessment:

It is my understanding that the applicant has undertaken an effects assessment in relation to the treated sediment discharge to the Mahurangi Harbour (via the Mahurangi River) on the east coast and the Kaipara Harbour (via the Hōteio River and Oruawharo River) and proposed mitigation conditions to avoid significant adverse effects.

Therefore, the focus of my assessment is a review of the applicant's marine ecological assessment and commentary on the adequacy of the proposed mitigation to avoid significant adverse effects on aquatic life in the marine receiving environment.

The Indicative Alignment passes through three major catchments; Mahurangi River, Hōteio River and Oruawharo River.

The potential adverse effects on the marine environment of the Project are all indirect, arising from the discharge of treated runoff from open earthworks during construction and treated stormwater runoff from the road during the operational phase. Discharge of treated runoff to the Mahurangi Harbour (via the Mahurangi River) on the east coast and the Kaipara Harbour (via the Hōteio River and Oruawharo River) on the west coast may occur throughout the construction and operation phases.

3.3 The Applicant's assessment

3.3.1 The Applicant's assessment of existing ecological values

Mahurangi Harbour

Overall marine ecological values of the Mahurangi Harbour are high in the middle to lower reaches, and moderate in the upper reaches.

Kaipara Harbour

Overall marine ecological values of the Kaipara Harbour are high in the middle to lower reaches, and moderate in the upper reaches.

The applicant's ecologists have used the EIANZ (Ecological impact assessment New Zealand, 2018) Guidelines to assess the existing ecological values and concluded that overall ecological values of the mid to lower reaches of both the Mahurangi and Kaipara Harbours are similar (Table 2, Marine Ecology report). Both have generally low contaminant concentrations in sediment, oxygenated surface sediment, generally less than 50% silt and clay in surface sediment, some estuarine vegetation providing habitat for native fauna, and some habitat modification where oyster farms exist.

Ecological values are lower in the upper reaches of both the Mahurangi and Kaipara Harbours

compared to the middle and lower reaches, primarily due to a low diversity of benthic invertebrate assemblages in these areas, higher levels of silt and clay, less oxygenated surface sediment, and less estuarine buffer vegetation providing filtration and habitat for fauna.

Avifauna values

The large majority of the coastal bird species associated with the coastal environments of both the Mahurangi and Kaipara harbours are classified as threatened or At Risk, and as such both areas are considered to have very high coastal avifauna values.

3.3.2 Applicant's assessment on marine ecology

The Applicant's Ecology report states sediment runoff from open earthworks areas during large rainfall events discharging to the Mahurangi and Kaipara Harbours during construction of the Project has the potential to adversely affect marine ecological values; potential effects relate to large rainfall events which have the potential to result in acute effects and cumulative sedimentation in the harbours throughout the entire construction period.

The Applicant's Marine Ecology report provides the following:

- Modelling indicates significant adverse effects (of a moderate level, EIANZ) on marine ecological values may occur in the Mahurangi Harbour in the 50-year ARI event, and in 10-year and 50-year ARI events in the Hōteō Inlet during the open earthworks period.
- The 10-year ARI event in the Mahurangi Harbour is considered to have a low level of effect.
- In the 50-year ARI rainfall event in Mahurangi Harbour, adverse effects on marine ecological values of a moderate level of effect may occur in the 5-year construction scenario. In this event, using the P-Wk maximum earthworks open area, the area of marine environment receiving >5-10mm increases from an existing baseline of approximately 90ha to 110ha; and the area receiving >10mm increases from an existing baseline of approximately 40ha to around 44ha. In the current Project, the area of open earthworks is likely to be approximately 58% of that for P-Wk, which will result in a smaller deposition footprint. Modelling indicates that sediment is primarily deposited in the upper reaches of the harbour (ie upstream of Hamiltons Landing).
- In 50-year ARI event in the Hōteō River catchment, the area of marine environment receiving >5-10mm and >10mm increases by 11-24 ha over the baseline (existing) deposition area. Whilst a much larger area is affected in the 50-year event, it is likely that benthic organisms would recolonise these areas, with community composition likely to be similar to baseline within approximately 3-5 years. The 50-year ARI rainfall event in the Hōteō Inlet could have a moderate magnitude of effect.
- Erosion and Sediment Controls (ESC) are an inherent part of the construction methodology of this Project. Both the Project Water Assessment Report and the Construction Water Management Design technical report assess the effectiveness of these control measures and accordingly, the best practice ESC will be put in place.
- Overall, the Marine Ecology report concludes that the level of effect of suspended sediments from construction of the Project on benthic invertebrates, and marine/estuarine habitat values is low to very low.
- The operational phase discharge of treated stormwater is likely to have an overall low level of effect on the coastal avifauna assemblages of the Kaipara and Mahurangi

Harbours.

Avifauna effects

The applicant's Marine Ecology report states the following in relation to avifaunal effects:

- The potential adverse effects on avifauna will be associated with food supply and / or foraging ability. During construction the potential adverse effects on marine water quality through increased suspended sediment, can have potential impacts on the ability of visual foragers to locate prey items. In addition, deposition of terrigenous sediment on benthic habitats could likely to smother benthic invertebrates and reduce the foraging prey available for avifauna that feed on intertidal flats.
- Any potential effects on avifauna are dependent on the level and duration of potential effects on marine ecological values. Given the low to very low level of effect on marine ecological values (during construction), the low level of predicted additional deposition of Project related sediment and the short-term nature of the elevated TSS levels, the mobile nature of the avifauna species and the extensive foraging habitat available in the harbours, the ecology report considers that the magnitude of effect on visual foragers to locate prey will be negligible. The overall level of effect from both suspended sediment and the predicted additional deposition of Project related sediment is likely to have a low effect on the coastal avifauna assemblages associated with the Mahurangi and Kaipara Harbours.

3.3.3 Applicant's Cumulative marine ecological effects of potential sediment deposition

Subject to the effective erosion and sediment control devices, residual sediment from runoff from open earthworks during the entire construction period will discharge to the Mahurangi and Kaipara Harbours and add to the baseline/existing sedimentation and future discharges such as those due to forestry harvesting. The residual Project related sediment, whilst small in comparison to the background sediment discharged for rainfall events smaller than the 10-year ARI, and small in comparison to predicted forestry harvesting discharges, contributes to the long term sedimentation of the harbours and is considered to be a cumulative effect.

The Project's contribution to the cumulative effect of sedimentation in the Mahurangi and Kaipara Harbours is assessed as negligible in the context of other inputs.

3.3.4 Applicant's recommended mitigation

The Ecology report states that for construction effects the authors have taken a conservative approach to mitigation and propose that actual sediment discharged from the Project during construction be measured at representative erosion and sediment control devices to inform whether mitigation (to reduce sediment loads) is required for both:

- cumulative sedimentation effects; and
- larger acute rainfall events (interpolated sediment load for >30-year ARI in the Mahurangi Harbour and modelled sediment load for >10-year ARI in the Hōteu catchment).

Mitigation measures that reduce the runoff of sediment from land to marine receiving environments that could be considered include planting of riparian margins (especially large streams) and retiring steep grazing or forestry land.

Minimisation of the deposition of terrigenous sediment in the marine environment is of utmost importance. That is why on large earthworks projects such as this Project significant effort is put into development and management of erosion and sediment control devices, site management, monitoring upcoming weather, training of contractors on site etc.

Deposition of terrigenous sediment in the marine environment is very difficult to remedy. Once sediment has deposited, attempts to remove that sediment would increase the level of effect on marine ecological values and increase the period over which natural recolonization of organisms would occur. Therefore, even if it was possible to distinguish Project sediment from catchment sediment and existing sediment, any ecological response to the deposition of Project-related sediment would need to be in the form of mitigation (or offset if mitigation was not possible), as attempts to remediate are not recommended.

For the reasons above, the authors of the Ecology report mention that they have developed a different approach to monitoring and mitigating construction-related sediment discharges, suitable for this Project.

The authors of the Ecology report propose measuring the load of Project-related sediment that is actually discharged including in particular acute large rainfall events over the entire construction period at source i.e. at a representative number of erosion and sediment control (ESC) devices. The data gathered can then be used to extrapolate likely effects (using existing Project modelling, assessment and factual information) and assess if mitigation is necessary.

In summary, the authors propose measuring the volume of sediment discharged from the Project at representative ESC devices during:

- 10-year ARI or bigger events in the Hōteo catchment; and
- 30-year ARI or bigger events in the Mahurangi catchment.

Overall, with appropriate mitigation in place, the applicant's Ecology report considers that adverse effects on marine ecology would be less than minor.

Sediment load triggers for mitigations

Mitigating sediment discharges from acute events (if they occur) in each harbour within a 25-year period by reducing sediment release through measures such as retiring steep farm and forestry land and riparian planting/stream bank stabilisation. If the total sediment load discharged from the Project is greater than 5% of the baseline, then that load (less the sediment from those larger acute events if they occur) also be mitigated through reducing other sediment discharges. The sediment discharge reduction from the proposed landscape and ecology (terrestrial and freshwater) planting has been modelled and should be considered to contribute to mitigation of the project-related sediment load discharged.

The proposed triggers for mitigation are:

- a) The load of sediment exceeding that calculated from modelling data for a >30-year ARI event in the Mahurangi Harbour (600 tonnes);
- b) The load of sediment exceeding that modelled for a >10-year ARI event in the Hōteo Inlet (512 tonnes);
- c) Total sediment discharged from the project during open earthworks is greater than 5% of the baseline sedimentation for the earthworks period, for each of the marine receiving environments i.e. the Mahurangi Harbour, Hōteo Inlet and Oruawharo Inlet.

Applicant's Marine Ecology report conclusion

Assessment of modelled rainfall events indicated that the 50-year event in the Mahurangi Harbour and 10-year and 50-year events in the Hōteio Inlet of the Kaipara Harbour may result in Project-related sediment having significant adverse effects in the upper harbour benthic habitats, with potential flow on effects to coastal avifauna that forage on the benthic intertidal flats.

Project-related sediment discharges from erosion and sediment control devices should be monitored throughout the duration of the construction period and should the Project's contribution to cumulative sedimentation of the harbour be significantly greater than predicted (5% or more of the baseline), the same quantum of sediment should be reduced through mitigation measures within a 25-year period.

In addition, authors recommend that sediment discharges during acute rainfall events that are greater than a 10-year event in the Hōteio catchment and greater than a 30-year event in the Mahurangi Harbour be mitigated in order to balance sediment discharged from those rainfall events also within a 25-year period. Options for reducing sediment discharges could include retiring steep farm or forestry land and additional riparian planting to stabilise stream banks.

The Marine Ecology report proposes sediment deposition triggers (acute and chronic) for both the Mahurangi Harbour and Hōteio Inlet during open-earthworks, based on sediment discharge estimates from a representative suite of ESC devices. Should sediment triggers be breached, measures to mitigate the load of sediment should be developed and implemented.

The Marine Ecology report have assessed the discharge of operational phase stormwater as having insignificant adverse effects on marine ecological values and avifauna.

Overall, with appropriate mitigation in place and benefits accruing within a generation (nominally 25 years), the Marine Ecology report considers that adverse effects would be less than minor.

3.4 Regulatory review

In general, I agree with the applicant's assessment and proposed approach to mitigation of potential significant adverse effects on marine ecological values, and I make the following points that are relevant to my assessment:

3.4.1 Ecological values

Whilst some of the criteria used in achieving this conclusion are subjective and can be interpreted differently by different experts, I agree with the overall conclusion of marine ecological values including avifaunal values of both harbours.

3.4.2 Assessment of ecological effects

Construction effects

The potential receiving environment of both harbours have been identified as having a number of SEA-M1 and SEA-M2 and significant wading bird areas in the AUP (OIP). However, information on benthic infauna and epifauna provided in the applicant's ecological report (from their field sampling in the potential depositional sites and from the literature review for both harbours) indicates the upper reaches of the harbours where sediment discharge from the Project is likely to be deposited post large rainfall events are not dominated by mud sensitive species such as cockles (bivalves) and other gastropods, but dominated by mud tolerant taxa (such as oligochaete and mud tolerant species of polychaete worms). Surface sediment grain

size information provided by the applicant's ecologists for the potential depositional area for both harbours from the Project indicates a high proportion of silt and clay (> 50%) in the upper harbour area. The concentration of common stormwater contaminants in the surface sediments except copper were below the ARC ERC and ANZECC SQ Guidelines.

Whilst all these findings (grain size, benthic community and sediment quality) indicate that the benthic habitats in the upper harbour areas have been depositional areas for sediment and inhabit mud tolerant species, it is likely that the species diversity in those areas have been changed to mud tolerant species due to the change in the accumulated level of sediment deposition and grain size from the natural sediment load. Therefore, it is likely that further changes in the upper reaches of both harbours in the benthic community composition may occur if fine sediment from the construction phase will be deposited in those areas.

There is no Guideline value to use as threshold for sediment deposition in relation to sub-lethal or lethal effects on benthic fauna. I note that the modelling used 3mm of deposition as threshold which has been widely used in the marine ecological assessments.

In the Kaipara Harbour, as the applicant's modelling and simulations predicted if the additional area receiving over 3mm of deposition over 4.4-5.5 ha in the 10 year ARI event and 11-24ha receiving 5mm & 5-10mm in the 50-year ARI event to occur in the upper reaches of the Kaipara Harbour, there is potential for a change in the benthic community composition inhabiting these areas.

In particular, this is more likely to happen if the 50-year event to occur during the construction period and over the habitats where there are sensitive species. Whilst the probability of 50year ARI event occurring is low (10%), the 50 year ARI event can cause sublethal and lethal effects in the benthic community composition which may have flow on effects on other trophic levels.

With regards to Mahurangi Harbour, the model predicts that in the 50 year ARI event, the area receiving >5-10mm increases from 90ha to 110ha; and the area receiving >10mm increases from 40ha to around 44ha. As mentioned for the Kaipara Harbour, if the 50 year ARI event occurs (10% probability), there will likely to be significant changes on benthic ecology over the area where 5-10mm and 10mm deposition occurs.

Whilst the soft sediment benthic community has the tendency to recover/recolonise within a relatively short period (3-5 years) depending on the recruitment of larval stage and life span of the inhabitants, recovery rate will likely to be influenced by ongoing sediment deposition. Generally, if the habitats have bioturbators like mud crabs or some species such as snapping shrimp or burrowing worms, these species will make the sediment favourable for recolonization by bioturbation.

There is a possibility some sensitive species might not be able to recover within the construction period if the 50 year ARI event occurs. If key benthic invertebrates at the site are smothered or killed by sediment deposition, this will have flow on effects on other trophic levels, and benthic community composition may become less diverse with a smaller number of opportunistic species that are tolerant of low oxygen conditions.

I note the modelling prediction indicates that that the sediment plume is quickly dispersed or settles on the seabed depending on the wind and wave conditions within a short concentration-time threshold ($\geq 0.08 \text{ kg/m}^3$ for ≥ 72 hours) with the exception of 50 year ARI event. Thus, the suspended sediment concentration is unlikely to have an adverse effect on filter feeders or foraging avifauna as the increase in suspended sediment concentration from the project is likely to be short term (< 7 days).

With regards to avifauna, any potential effects on avifauna are dependent on the magnitude

and duration of potential effects on marine ecological values. As noted above, if there is a significant change in the benthic community and an increase in the SSC for a longer period in the water column during a 50 year ARI event, it is likely to affect the foraging ability of avifauna. Otherwise, any adverse effects on avifauna will not be significant.

It is unlikely the Project will contribute to an increase in sediment load estimated by the applicant to be:

- 1,916 tonnes & 1% increase from baseline for Hōteio Inlet;
- 139 tonnes & 0.2 % from baseline for the Oruawharo Inlet; and
- 793 tonnes & 0.9% increase for Mahurangi Harbour),

over the 7 year construction period, and that the deposition may be relatively more in areas such as Kakaraia Flats (within the Kaipara Harbour).

The applicant is proposing to use the industry best practice ESC during construction and staging of earthworks during construction. This practice has been used in the P-Wk 5 year construction project and been used to verify the modelled sediment yield. The applicant is not proposing to directly monitor the effects on marine ecological values in the upper reaches of both harbours from the Project. However, the applicant's approach of measuring the volume of sediment discharged from the Project at representative ESC devices during 10-year ARI or bigger events and 30-year ARI will help to mitigate the load of sediment.

Whilst the applicant is proposing 5% cumulative threshold discharge to retrospectively mitigate sediment discharges for the entire catchment, it is not clear how the threshold (5%) was derived and due to the significant ecological values of the receiving environment, I welcome further evidence from the applicant on why this threshold is not practicable to be reduced. I also recommend that mitigation activities should commence proactively to reduce the sediment load reaching the marine environment as practical as possible rather than waiting for up to 25 years after the project, again I welcome further evidence on why this would not be practicable. However, I support the mitigation proposed by the applicant such as retiring steep farm and forestry land and riparian planting/stream bank stabilisation to reduce the volume of discharge from the Project to the Harbours.

As noted above, benthic community in the upper harbour is likely to be tolerant to sediment deposition due to existing high levels of mud in the foreshore and seabed. If the sediment deposition from the Project exceeds 5mm up to 10mm as indicated in the 50-year ARI rainfall event in particular, some benthic fauna may be adversely affected depending on the thickness of the sediment and duration of smothering.

However, soft sediment fauna have the tendency to recolonise within relatively short period depending on the size and recruitment of larval stages. This effect is expected to be short term and not significantly adverse.

With regards to avifauna, as the applicant's assessment noted that any potential effects on avifauna are dependent on the magnitude and duration of potential effects on marine ecological values.

Combined with the proposed use of the best ESC during construction and of measuring the volume of sediment discharged from the Project at representative ESC devices during construction, I am of the opinion that significant adverse effects on marine ecology (aquatic life) including avifauna and habitat in the upper reaches of both harbours will be avoided.

Water quality

The modelling prediction for the Kaipara Harbour shows that the sediment plume is likely to be quickly dispersed or settled on the sea bed depending on the wind and wave conditions. Whilst the concentration-time threshold ($\geq 0.08 \text{ kg/m}^3$ for ≥ 72 hours) is not exceeded in any of the 10-year ARI baseline simulations or the 50-year ARI event with SE and calm winds, the 50-year ARI NE wind event exceeds the concentration-time threshold over an area of 2.1 ha. As sediment grain size from the potential sediment discharge from the Project to the harbours will likely to be fine particles, suspended sediment during the 50 Year ARI event likely to be in the water column for more than 3 days and could affect water quality. This effect is likely to be short term.

Overall, the effects on water quality in relation to suspended sediment from the Project will not be significant with the exception where suspended sediment concentration will be higher over an additional area of 2.1 ha in the water column for ~ 7 days.

Cumulative effects

Whilst it is agreed with the applicant that the Project's contribution to the sedimentation of the harbours are not significant in the context of other inputs, I note that the marine receiving environment (both harbours) have been recognised for the increased deposition of muddy sediment.

Recently, Ministry for the Environment (MFE) has funded (\$100 million to kick start the 200 million six year) a Kaipara Moana Remediation Programme to halt degradation of the Kaipara Harbour. This programme is an evidence of recognition of the degradation of the Harbour.

Swales et al (2011) identified long term sinks for fine sediments in the Kaipara Harbour which included Kakarai Flats in the vicinity of the Hoteo River mouth.

There is a possibility for the applicant to collaborate (in relation to some of the mitigation options proposed) with MFE to work on their programme to improve the water quality if the construction timeframe coincides with the MFE project's programme.

Operational effects

Whilst the residual sediment and associated contaminants from the operational phase of the stormwater will likely to be discharged to the harbours via rivers, the proposed wetlands will likely to remove $\sim 75\%$ of TSS and associated contaminants from the stormwater. Hence, contaminant concentrations in the operational phase of stormwater are unlikely to cause any significant adverse effects on marine ecological (aquatic) values.

3.4.3 Summary

In summary, subject to:

- the effectiveness of the ESC devices and controls,
- the monitoring of the sediment triggers proposed by the applicant and subsequent in catchment mitigation to reduce sediment yields to the marine receiving environments; and
- the proposed treatment of stormwater from the operational phase,

it is my opinion that any adverse effects on marine ecology including avifauna and water quality

from construction and operational phase of the Project will not be significant.

4.0 SUBMISSIONS

I have considered the Royal Forest and Bird Society (Forest & Bird) and Department of Conservation submissions as being relevant to my assessment.

Forest and Bird

The submission has raised a number of environmental and sustainability issues, including climate change. The issue directly relevant to my assessment is the submitters concern of the ultimate effects to the Kaipara and Mahurangi Harbours from sedimentation.

I acknowledge Forest & Bird's concern that Council is considering a resource consent application for an activity that is not scheduled to commence until 2030 as existing environment could change dramatically.

I agree that there may be changes in the effects in relation to climate change, increase in scientific knowledge, improvement in sediment control devices and possibly some implementation of the MFE funded project in the Kaipara Harbour. If any of the changes occurred before the Project commences, it would be appropriate to revisit the assessment of effects in relation to the potential change to ensure the best practices are in place for the Project construction.

With regards to sedimentation effects on the Harbours, the Project will contribute to the sedimentation of both Harbours, relatively more to Kaipara Harbour as large area of earthworks fall in the Hoteo catchment and the predicted sediment load from the Project is relatively higher for Kaipara Harbour. Whilst the Project's contribution to the sedimentation of the harbours are not significant in the context of other inputs, if 50 year ARI event occurs within the construction timeframe, any adverse effects on the Harbours are likely to be significant.

Department of Conservation

The submission supports the highway in principle; however, it raises a number of concerns in relation to granting of the consent.

The issues directly relevant to my assessment is the submitters concern related sedimentation of the Kaipara and Mahurangi Harbours from the Project. I note that the submission supports the overall approach to addressing the impacts of sedimentation, that is the monitoring of cumulative and acute discharges of sediment from the work sites to determine the total sediment load discharges into the environment. In addition, the submission supports the limits on active earthwork areas, and the requirement for rapid stabilisation of worked areas.

However, it raises an outstanding concern relating to the timing and thresholds for responding to sediment discharges during construction. The submission considers that the 5% cumulative threshold discharge proposed to retrospectively mitigate sediment discharges for the entire catchment to be too high given the significant ecological values of the receiving environment.

I agree with the concerns raised in the submission and recommend sediment mitigation activities should commence proactively to reduce the sediment load reaching the marine environment as practical as possible.

5.0 CONDITIONS

I have reviewed the following proposed conditions in relation to potential sediment discharge from the Project to the marine receiving environment which are listed below.

- conditions 21-29 relates to Erosion and sediment control (ESC) outcomes;
- conditions 31-32 relates to Adaptive Monitoring Programme (AMP);
- conditions 34-36 relates to monitoring effects of a trigger event,
- conditions 37-42 relates to sediment reduction activities, and
- condition 80 relates to stormwater treatment.

Condition 21b states that one of the ESC Outcomes for the project is to “*monitor sediment yields and assess and remedy effects on freshwater and marine environments at the prescribed thresholds in Conditions 34 to 42*”.

Condition 31 requires an adaptive management plan to be certified prior to works that enables an accurate calculation of Acute Event Sediment and Cumulative Sediment. Acute and Cumulative threshold events are defined at the start of the condition set.

Conditions 37-42 set out the process for sediment retention activities in the instance that acute event and/or cumulative sediment occurs, and requires the activities to occur over a 25 year period.

Whilst I generally support those conditions, I welcome further evidence from the applicant on why the acute and cumulative events as per the definitions have not been minimised as far as practically possible.

I also recommend the 25 year period in conditions 37-42 is reduced closer to a period of 5 years, unless it is demonstrated by the applicant that this is impracticable.

6.0 RECOMMENDATION

The assessment in this memo does not identify any reasons to withhold consent, and the aspect of the proposal considered by this memo could be granted consent.

Subject to the imposition of the proposed consent conditions, including adherence with the best ESC practices, it is considered that any significant adverse effects on marine ecological values can be avoided from the potential sediment discharge from the Project.

Memo prepared by:

Dr. Kala Sivaguru

Senior Coastal Specialist

Date:

A rectangular box containing a handwritten signature in blue ink that reads "K Sivaguru".

27 August 2020

Technical Memo –Specialist Unit

To:	Nicola Holmes – Lead Planner
CC:	Blair Masefield – Project Manager
From:	Matthew Byrne, Consultant Specialist – Earthworks & Streamworks, Specialist Unit, Resource Consents
Date:	17 August 2020

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Waka Kotahi – New Zealand Transport Agency
Application purpose description:	Earthworks associated with a Notice of Requirement to amend the Unitary Plan and associated Regional Resource Consents to enable the construction, operation and maintenance for a new four lane state highway from Warkworth to Wellsford (Te Hana)
Relevant application numbers:	BUN60354951. The individual resource consent application numbers are: LUC60354952, LUS60354955, WAT60354953, WAT60355184, WAT60356979, DIS60354954, LUC60355185, DIS60355186
Site address:	Multiple sites located between Warkworth and Te Hana

2.0 ADEQUACY OF INFORMATION

The assessment below is based on the information submitted as part of the application. In particular, I have reviewed the following documents:

- *Assessment of Effects on the Environment: Warkworth to Wellsford Project*, by Jacobs GHD Joint Venture, dated March 2020. (AEE)
- *Warkworth to Wellsford Construction Water Management Design Technical Report*, by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd., dated July 2019. (CWMDR)
- *Warkworth to Water Assessment Report*, by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd., dated July 2019. (WAR)
- *Warkworth to Wellsford Catchment Sediment Modelling Technical Report*, by Jacobs GHD Joint Venture in association with Ridley Dunphy Environmental Ltd., dated July 2019 (CSMR)

- *Proposed Draft Consent Conditions*, by NZTA, dated May 2020.
- Response to a request for additional information under section 92 of the RMA, by Jacobs GHD Joint Venture, dated 29 July 2020. (S92 response)

It is considered that the information submitted is sufficiently comprehensive to enable the consideration of the effects of the application on an informed basis:

- a. The level of information provides a reasonable understanding of the nature and scope of the proposed activity as it relates to the AUP:OP.

The extent and scale of any adverse effects on the environment are able to be assessed.

Project in brief:

- Based on the indicative alignment proposed, approximately 12.4M m³ of cut and 9.6M m³ of fill earthworks are proposed over approximately 310ha along a 26km route between Warkworth to Wellsford (Te Hana), including twin bore tunnels beneath Kraack Road approximately 850m in length, and at least one viaduct (or twin bridge structures) approximately 485m in length to span the existing State Highway 1 and the Hoteo River.
- Earthworks will be undertaken in three sections being; the southern section from the southern extent of the project at Warkworth to the northern tunnel portal; the central section from the northern tunnel portal to the Hōteo River (southern abutment); and, the northern sections from the Hōteo River (northern abutment) to the northern tie in with existing SH1 near Maeneene Road, Te Hana.
- Approximately 30% of the indicative alignment contains grades steeper than 15 degrees.
- Approximately 45% of the indicative alignment is contains grades steeper than 10 degrees.
- Approximately 25% of the indicative alignment is contains grades less than 10 than 10 degrees.
- Earthworks associated with the following activities are proposed: changes to local roads based on the final design, establishment of construction yards, lay down areas and storage areas, earthworks for access and haul roads, earthworks for the construction and installation of bridges, culverts, drainage, stormwater treatment systems, soil disposal sites, signage, ground stabilisation, landscaping and the installation of any additional and associated civil infrastructure.

A detailed description of the project and the environments through which the motorway is proposed is contained in the application documents referenced above and is not repeated here. Potential sediment discharges associated with the earthworks and land disturbance activities proposed will be to three freshwater catchments identified as the Mahurangi River catchment, the Hōteo River catchment (which includes the Kourawhero and Waiteraire sub-

catchments), and the estuarine Oruawharo River catchment (which includes the Te Hana Creek and Maeneene sub-catchments). The indicative alignment crosses many tributaries in these areas, as well as the main branch of the Hōteō River. The ultimate coastal receiving environment for potential sediment discharges will be to either the Mahurangi Harbour or the Kaipara Harbour. More detailed descriptions of these coastal environments are contained in the application documents listed above and are not repeated here, however, it is noteworthy that both the freshwater and marine receiving environments are subject to multiple significant ecological areas (SEAs) which have been identified in the application documents.

3.0 ASSESSMENT OF EFFECTS

The applicant's approach to addressing the potential effects of undertaking earthworks and land disturbing activities for the project, relies upon the preparation of various management plans for approval by Council ahead of earthworks, including enabling works, commencing. The following assessment therefore focuses on whether the management plans that relate to the earthworks and land disturbance, and in particular the erosion and sediment control aspects, are appropriate or not. This assessment includes comment on the applicant's proposed conditions of consent that relate to earthworks and erosion and sediment control management and includes comment from a compliance monitoring point of view, for which I have extensive experience.

The applicant has stated in section 9.2 of the AEE that the potential effects of the proposed land disturbing activities, being predominantly earthworks, streamworks and vegetation removal, have the potential to increase the risk of sediment laden runoff being discharged to the freshwater receiving environments that will be encountered along the project route, and ultimately to the marine receiving environments of the Mahurangi and Kaipara Harbours.

In order to address these potential effects, the applicant has, generally speaking, proposed to undertake the earthworks in a manner that represents industry best practice for erosion and sediment control, will meet or exceed the general principles and practices outlined in Auckland Council's latest guidance, *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*, June 2016 (GD05), and which represent what is considered the best practicable option for managing erosion and sediment control in the Auckland Region.

As the application documents outline an earthworks methodology based on an indicative alignment only, additional details of the specific earthworks and erosion and sediment control measures will be required. To address these specific requirements, the applicant has, as noted above, proposed the provision of management plans for Council approval ahead of works commencing. These management plans are to contain all the necessary information to help ensure that best practice erosion and sediment control measures are adopted during any and all land disturbance associate with the proposal.

In general, the proposed resource consent conditions include the provision of an overarching erosion and sediment control plan (ESCP) which will inform the project's overall erosion and sediment control management approach, and more specifically, they include requirements for the provision of construction erosion and sediment control plans (CESCPs)

ahead of works commencing at any given area of the site. The proposal also includes the provision of an adaptive monitoring plan (AMP) which is to help ensure that the project's erosion and sediment control measures and methodologies, adapt and change in response to actual "on the ground" monitoring results in order to help ensure that industry best practice is adhered to at all times throughout the land disturbance activities associated with the proposal. The above measures are currently utilised for the P2Wk project and based on my experience monitoring the earthworks as they relate to the erosion and sediment control aspects of that project, I consider them to be appropriate for this project. In brief, the project proposes the following:

- Working to industry best practice at the time of construction;
- Staging of the land disturbance activities to limit the amount of exposed earth subject to rainfall and runoff erosion at any one time;
- The installation of perimeter controls to divert clean water away from exposed earth surfaces to help ensure that it does not enter the exposed earthworks area and contribute to the amount of water that requires treatment or affect the proposed sediment controls downslope of these boundaries.
- The establishment of dirty water diversions to direct sediment laden runoff to an appropriate treatment device before it is discharged to the receiving environment;
- Progressive and rapid stabilisation of exposed areas as necessary due to weather conditions or when earthworks in a given area are suspended or have been completed;
- The installation of sediment controls such as sediment retention ponds (SRPs), decanting earth bunds (DEBs), silt fencing and super silt fencing, and other impoundment devices to remove as much as much sediment as is practicable from the water column before it is discharged to the receiving environment; and,
- The continuous sampling and testing of water samples from selected SRP and DEB discharge locations and if elevated levels of sediment discharge are found to be occurring, then site based investigations are carried out to determine the cause and corrective actions and / or adaptations are implemented to reduce ongoing and future discharges.

As noted, the above measures are generally considered appropriate to help manage the potential effects associated with land disturbance. Additional comments regarding my recommended changes to the applicant's proposed conditions, to further help ensure appropriate management of potential effects, are included below.

The following is an overview and assessment of the applicant's management plans as they have been proposed through their recommended conditions of consent. The assessment has been generally undertaken by assessing the matters over which Council generally applies its discretion to, when assessing a land disturbance proposal. As noted above, the two main management plans that relate to the earthworks and erosion and sediment control measures which have been proposed, are the overarching ESCP and the CESCPS for any

given area of the site. The provision of an AMP falls within the applicant's proposed conditions of consent.

Erosion and Sediment Control Outcomes and content of the ESCP

The applicant has proposed that the project's erosion and sediment controls prioritise minimisation of sediment generation, minimise the volume and area of the proposed earthworks required for the project through earthworks design appropriate to slope and expected soil types and geology, maximise the effectiveness of erosion and sediment control (ESC) measures associated with earthworks by minimising potential for sediment generation and sediment yield, and minimise the discharges of all construction water related contaminants. These measures are considered appropriate and are considered minimum standards given the nature and scale of the land disturbance associated with the project.

Outside of the normal, industry best practice measures expected on an earthworks project of this nature, the overarching ESCP includes identification of processes and measures to ensure that stormwater runoff, being both clean and sediment laden, is managed as a minimum, in accordance with industry best practice and GD05 principles and practices. That is to say, managing runoff to ensure that clean water stays clean and dirty water is treated before it is discharged to the receiving environment. The ESCP will also include identification of procedures for weather monitoring; for identifying and recording the occurrence of particular rainfall events; the procedures for decommissioning ESC measures; the procedures for ensuring that progressive stabilisation of exposed areas is carried out during land disturbance activities; a procedure to identify the difference between minor and more than minor changes to ESCs on any given part of the site; procedures for amending the ESCP; identification of relevant staff and training of staff who are associated with ESC; and, procedures for ensuring that open areas are maintained within consented limits throughout the duration of the project.

ESC Standards and the Content of the CESCPS

Based on my experience, the provision of ESCPs or in this case, CESCPS, ahead of any land disturbance commencing at any given area of the site, and ensuring that the CESCPS is followed as closely as possible, is by far the most important factor in appropriate management of the potential effects associated with sediment discharge. The proposed CESCPS condition includes requirements for specific ESC measures which form the basis for appropriate management of clean and dirty water in that particular catchment. The ESC standards proposed by the applicant include a minimum 3% storage volumes for SRPs and DEBs, and for clean and dirty water diversions to accommodate the runoff generated during a 1 in 100 year rainfall event. These measures are over and above the general requirements outlined in GD05 and will help ensure that erosion and sediment control is appropriately managed on site during land disturbance. The proposed erosion and sediment control standards also include the installation silt fences and super silt fences in accordance with an older design which is outlined in TP90, the precursor to GD05. Whilst I disagree with the inclusion of references to any documents other than what is considered current best practice, being GD05, the applicant feels that the older design for these devices is more robust than what is currently contained in GD05. Based on my experience, the two designs provide an equivalent level of control provided they are installed in accordance with their respective

instructions. As such, whilst I do have concerns with the inclusion of any references to older guidance documents, I do not have any concerns with the applicant's proposed inclusion of an older design. To address this particular matter, I recommend that the CESCPS contain actual design details of the proposed silt fences and super silt fences so that the required standards are clear and unambiguous. I also recommend that the CESCPS contain design details of the oversized diversion bund / channel requirements so these too are clear and unambiguous. Lastly, I recommend that references to TP90 or any other erosion and sediment control guidance document, be excluded from the consent conditions altogether as it is my experience that regardless of the content of ESCPS or in this case CESCPS, controls are sometimes constructed and or installed by an individual in accordance with "what they know". Given that GD05 has now been in use for over 4 years, what are typically known are the designs contained in GD05 and including references to guidance documents other than GD05 introduces the potential for confusion and inconsistency.

Regarding other matters pertaining to the CESCPS, the proposed content is not out of the ordinary and will help ensure that potential effects are managed appropriately. Provision of catchment boundaries, ESC device information, construction water management measures and identification of any earthworks and streamworks methodologies and procedures will help ensure that land disturbance, including the physical land disturbance associated with streamworks, is appropriately managed. I do, however, recommend that the level of detail contained in the CWMDR be incorporated into the conditions of consent where these will be relied upon rather than the CWMDR.

The applicant has also proposed the inclusion of chemical treatment management plan (CTMP) for utilisation on all impoundment devices. Aside from DEBs controlling catchments less than 500m², the proposed plan is to be based on a rainfall or flow activated system for all devices, including container impoundment systems. I concur with the applicant's proposal to chemically treat all impoundment devices as it is considered best practice and helps to ensure that all sediment laden runoff is treated to the maximum extent practicable, however, I disagree with the applicant's proposal to not require a rainfall or flow activated system for DEBs with a catchment of less than 500m². It is my experience that rainfall activated systems are beneficial no matter how small the contributing catchment. As such, I recommend that the CESCPS contain a requirement that all DEBs are chemically treated by a rainfall activated system in accordance with the CTMP, regardless of its contributing catchment.

The recommended consent conditions also contain reference to flocculation socks, and I have recommended in my review of the proposed consent conditions, that this reference be removed from the conditions. Flocculation socks are a product that is impregnated with a particular amount of chemical, PAC normally, or is a small, porous bag filled with powdered chemical. They are designed to release chemical when placed in a flow of water (i.e., in a dirty water diversion channel), to help increase flocculation and sediment drop out in an impoundment device. The concern with flocculation socks is that it is difficult to determine when the sock is "empty" and no longer providing any chemical to the water requiring treatment, and more importantly, the dose rate of chemical is often fixed and not necessarily the correct rate for a given impoundment device. This can lead to under or overdosing of impoundment devices and unintended changes to the pH of a discharge, particularly in smaller devices such as DEBs.

The remaining information requirements included in the proposed consent conditions associated with chemical treatment of ESCs are considered appropriate.

Adaptive Monitoring Plan

The application documents include a proposal to implement a “Continuous Improvement monitoring programme”, as described in the WAR, or an “Adaptive Monitoring Plan”, as described in the proposed conditions. They essentially propose the provision of an AMP ahead of construction works (land disturbance) commencing on any given part of the site. In principle, the purpose of an AMP is to enable the management of a particular activity or effect, in order for it to evolve and adapt in response to measured data, primarily in this case, sediment discharges from sediment control devices utilised on site. Section 5.4 of the WAR outlines the proposed details that have been proposed for inclusion in the AMP. In general they include possible management responses such as alterations to erosion and sediment control measures and methodologies, additional ESC measures, refinement of chemical treatment systems, progressive stabilisation in sub catchments, increase maintenance of controls, amendments to methodologies and sequencing of works and refinement of controls necessary and reduction of open area limits of earthworks. The AMP will include provisions for reporting and will also allow for assessment of overall sediment yields attributable to the earthworks during given rain events as well as being measured against the predicted yields set out in the CSMR. These measures are considered appropriate.

In practice, it is my experience that AMPs require a consent holder to continually observe and check the ongoing suitability of ESCs for a particular area of a site, and to ensure that appropriate maintenance is completed where required on any given ESC device or methodology. That is to say, that an AMP re-enforces the basic requirements of erosion and sediment control consent compliance, for while adaptive management applies in addition to, and not instead of, basic consent compliance, rigorous and continuous self-monitoring of ESCs is not always practiced across some of the larger earthworks sites in the Auckland Region. In my experience, while regular checks of all ESC devices on a given site is a general requirement as per industry best guidance, in practice, most ESC maintenance and “adaptation” is reactionary and not preventative. The benefit of an AMP is that it re-enforces the requirement for basic consent compliance and helps promote a much better understanding of construction water management, either during or immediately after a moderate rainfall event. It is far better to observe erosion and sediment control measures when they are working rather than during a period of fine weather, and an AMP includes requirements to undertake these observations while devices are “actively working”.

An additional benefit of AMPs is that they provide Council with a level of certainty that more than what is required from a self-monitoring point of view, is being done on a given site. Measured data that is typically included in AMP reporting also provides up to date information to the Council regarding discharges from ESCs to the receiving environment and helps inform the Council that these discharges are being appropriately monitored and managed. As such, I consider the inclusion of a requirement for an AMP to be appropriate.

Although the applicant’s proposed AMP includes information and reporting requirements that are considered appropriate, I have included further recommendations in the proposed conditions of consent to include baseline monitoring. A pre-construction baseline monitoring

methodology should be included in the AMP to indicate the locations of any proposed monitoring sites and the type of monitoring to be undertaken. That methodology should be prepared under the advice of ecology, water quality and earthworks specialists. Typical parameters to be monitored should be:

- turbidity and clarity
- sediment deposition
- channel morphology and substrate composition.

Due to the nature and scale of the project, baseline monitoring may be required at multiple sites and within multiple stream reaches. The exact locations and content of the baseline monitoring will change as a result of the project's final detailed design; therefore it is recommended that through the proposed conditions of consent, minimum information requirements be identified in the AMP conditions.

Stabilisation & Open Area Limits

The application proposes progressive stabilisation of completed areas as works progress and states that a "14 day stabilisation requirement" is proposed, however, this requirement has not come through in the applicant's proposed consent conditions. The P2Wk project includes a condition that requires the consent holder to stabilise exposed areas if they have not been "worked" for a 14-day period or more. This condition is ideal from a compliance monitoring point of view as it re-enforces progressive stabilisation requirements and helps ensure that areas are not left exposed while design changes are made or while other matters are attended to. Further, this requirement ensures that "production" is not placed ahead of erosion and sediment control and helps ensure that appropriate resources are made available to the ESC Team for stabilisation purposes. I recommend that a condition to this effect be included.

The application proposes a maximum open area of 143.3ha at any one time, split across three separate catchments. The Hoteo catchment having the largest open area being 75ha at any one time, the Mahurangi catchment being 43.3ha at any one time, and the Oruawhoro being 25ha at any one time. Whilst my experience monitoring the P2Wk project indicates that a total catchment of more than 100ha being open at any one time is manageable, it becomes increasingly difficult to successfully stabilise open areas as the earthworks season comes to a close at the end of April. Weather plays an important factor in gaining equipment access to areas that require stabilisation and if inclement weather occurs during April, then meeting open area targets by the end of the month can become difficult.

It for this reason that I consider the open area limits as applied for in the application documents to be appropriate for six months, October to March, rather than for the entire earthworks season, being seven months from October to April. At the beginning of an earthworks season open areas are typically governed by ground conditions and it is normal for areas to open up progressively with maximum limits only being reached once ground conditions allow it, therefore it is unlikely that the entire area would become open from the 1st of October. Having an additional month towards the end of the season, however (March), where weather starts to become an important factor in reducing open areas, provides additional time to identify appropriate areas where stabilisation can be achieved and it

relieves pressure to fully stabilise significant amounts as the earthworks season comes to a close. An additional month of restriction also provides a contingency against unforeseen weather delays.

As such, I recommend that open area limits are decreased from the 1st of April to 50ha in the Hoteo catchment, 25ha in the Mahurangi catchment and 15ha in the Oruawharo catchment. Should the consent holder wish to adjust these figures, they could apply to Council, via the normal process for amendments to the CESCPS, for an increase. By imposing these restrictions, it would not only reinforce progressive stabilisation requirements but help ensure that the nominated contractor is not “caught out” towards the end of the earthworks season where they may not be physically able to stabilise significant areas due to access or availability of stabilisation equipment.

Catchment Sediment Modelling

As referenced in section 2 above, the application documents contain a Catchment Sediment Modelling technical report (CMSR) that estimates the construction sediment yield increases that would be delivered to the freshwater and marine receiving environments during the construction phase of the project. The CMSR modelling predicts sediment yields for both the Mahurangi Harbour catchment and for the Kaipara Harbour River catchment, including the Oruawharo River catchment. The modelling for the Mahurangi catchment relies upon the assessments undertaken for the P2Wk project while separate modelling was undertaken for the Kaipara Harbour catchment.

Approximately 43.3ha of earthworks are proposed in the Mahurangi catchment during the 7-year construction programme and the applicant’s CMSR has predicted that over that period, the sediment load from the project will increase by 793 tonnes, a figure that represents a 0.9% increase above the predicted baseline. Approximately 100ha of earthworks are proposed in the Kaipara Harbour catchment with 75ha proposed in the Hoteo River catchment and 25ha proposed in the Oruawharo catchment, during the 7-year construction programme. The applicant’s CMSR has predicted that over that period, the sediment load delivered to the Hōteu Inlet will increase by 1,459 tonnes, a figure that represents a 0.8% increase above the predicted baseline, and the sediment load delivered to the Oruawharo Inlet is predicted to increase by 98 tonnes, a figure that represents a 0.2% increase above the predicted baseline. These figures represent the predicted annual sediment load in tonnes, discharged to the respective harbours corresponding to changing land-cover (earthworks) during the 7-year indicative construction programme.

The modelling generally indicates that the existing, pre-development sediment yields into the respective catchments is high and that the predicted yield as a result of the project’s earthworks represents a minor increase in total yields. The predicted sediment yields above assume certain efficiencies for erosion and sediment controls which, based on the implementation of best practice and rigorous and ongoing monitoring and maintenance are not out of the ordinary.

Conclusions

Overall, I consider that the applicant has proposed industry best practice measures for the management of the potential effects associated with erosion and the generation of sediment from the proposed earthworks operation. The applicant has proposed measures which are consistent with or better than those outlined in GD05 which is considered to represent the latest guidance on erosion and sediment control in the Auckland Region. Further, aside from any additional recommendations based on my compliance monitoring experience, I consider that the applicant has also proposed the best practicable option with regard to managing potential effects in this regard and that based on the indicative construction program, there is nothing more that the applicant could do from an erosion and sediment control point of view. I have appended to this memo, my comments on the applicant's proposed conditions and provided my recommendations with regard to erosion and sediment control are adopted, and provided the erosion and sediment controls are installed and constructed in accordance with the AEE and appended reports, the relevant supporting documentation, the recommendations above and any additional requirements as deemed necessary by the guidance outlined in GD05, it is considered the resulting effects on the environment from sediment discharges during the earthworks will be appropriately managed.

4.0 SUBMISSIONS

I have reviewed the submissions associated with the project, in particular those against the project for reasons associated with the potential effects of sediment discharge and I consider that the applicant has proposed sufficient measures from an erosion and sediment control point of view to manage the potential sediment related effects appropriately. I have extensive experience both assessing the potential of and of monitoring the actual effects of undertaking earthworks at the scale proposed in the application. It is my opinion that the applicant cannot realistically do anything additional than what is proposed to manage these potential effects.

5.0 CONDITIONS

I have reviewed the proposed conditions and have appended a table outlining my recommended amendments.

6.0 RECOMMENDATION

The assessment in this memo does not identify any reasons to withhold consent, and the aspects of the proposal considered by this memo could be granted consent, subject to recommended conditions, for the following reasons:

- Subject to the imposition of consent conditions, it is considered that the potential sediment related effects on the receiving environment will be adequately managed.
- The sensitivity of the receiving environment to the potential effects of sediment discharges will not be compromised given the potential level of discharge, the

application of suitable control technologies and appropriate on-site management techniques.

REVIEW

Technical memo prepared by:

Matthew Byrne



Specialist Advisor, Earth, Streams & Trees Team, Specialist Unit, Resource Consents

Date:

20 August 2020

Technical memo reviewed and approved for release by:

David Hampson



Team Leader - Earth, Streams & Trees Team, Specialist Unit, Resource Consents

Date:

20 August 2020

Appendix A: MCB – Comments on relevant conditions. July 2020.

Proposed Condition	Specific Comments from AC						
<p>Definitions</p> <table border="1"> <tr> <td>GD05</td> <td>Auckland Council Guideline Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (June 2016), Incorporating Amendment 1, or any subsequent version</td> </tr> <tr> <td>Manager Council</td> <td>The Manager Council – Resource Consents, of Auckland Council, or authorised delegate</td> </tr> <tr> <td>Stabilised, Stabilised Area</td> <td>Refers to an area inherently resistant to erosion such as rock or an area that has been stabilised after earthworks and is excluded from the definition of Maximum Open Earthworks Area. Stabilisation methods may include use of mulch and/or other woody organic matter, geotextile, the use of hard fill material and exposing rock as set out in GD05 or as approved through conditions or certified CESCPS.</td> </tr> </table>	GD05	Auckland Council Guideline Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (June 2016), Incorporating Amendment 1 , or any subsequent version	Manager Council	The Manager Council – Resource Consents, of Auckland Council, or authorised delegate	Stabilised, Stabilised Area	Refers to an area inherently resistant to erosion such as rock or an area that has been stabilised after earthworks and is excluded from the definition of Maximum Open Earthworks Area. Stabilisation methods may include use of mulch and/or other woody organic matter, geotextile, the use of hard fill material and exposing rock as set out in GD05 or as approved through conditions or certified CESCPS .	<p>I recommend including reference to the latest version of GD05, incorporating amendment 1.</p> <p>Reference should align with the current practice which is to refer to the Manager as “Council”. An advice note will be included indicating that the “Council” is represented by the relevant Compliance Team Leader for compliance related matters.</p>
GD05	Auckland Council Guideline Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (June 2016), Incorporating Amendment 1 , or any subsequent version						
Manager Council	The Manager Council – Resource Consents, of Auckland Council, or authorised delegate						
Stabilised, Stabilised Area	Refers to an area inherently resistant to erosion such as rock or an area that has been stabilised after earthworks and is excluded from the definition of Maximum Open Earthworks Area. Stabilisation methods may include use of mulch and/or other woody organic matter, geotextile, the use of hard fill material and exposing rock as set out in GD05 or as approved through conditions or certified CESCPS .						

	Where vegetation is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once an 80% vegetation cover has been established.		
<p>Review</p> <p>2. These conditions may be reviewed by the Manager Council under section 128 of the Act, by giving notice pursuant to section 129 of the Act, at any time within six months of the first, second, third, fourth, and fifth anniversaries of the date of commencement of the construction of the Project authorised by this consent:</p> <ul style="list-style-type: none"> a. To deal with any adverse effect on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or b. To review the adequacy of any monitoring. 		Condition 5 to be deleted	Inappropriate as the as the Council cannot certify or approve something by doing nothing.
<p>6 The Consent Holder shall not commence Project Works within the area to which a management plan applies until the required management plan(s) has been certified or is deemed to be certified.</p>		Condition 7	
Table 2: Management Plan Table			

Management Plan	Decision Pathway	When to submit	Response time from Manager Council	Duration for implementation
Construction Environmental	To Manager Council for Information	At least 20 days prior to start of Construction Works	N/A	Duration of Construction Works
Enabling Works Construction Environmental	To Manager Council for Information	At least 20 days prior to start of Enabling Works	N/A	Duration of Enabling Works
Erosion and Sediment Control	Certified by Manager Council	Prior to start of Construction Works		Duration of Construction Works
Chemical Treatment	Certified by Manager Council	Prior to start of Construction Works		Duration of Construction Works
Construction Erosion and Sediment Control	Certified by Manager Council	Prior to start of Construction Works for specific area and/or activity		Duration of specific works and/or activity
Enabling Works Construction Erosion and Sediment Control	Certified by Manager Council	Prior to start of Enabling Works		Duration of Enabling Works
Adaptive Monitoring	Certified by Manager Council	Prior to start of Construction Works		Duration of Construction Works

Sediment Reduction Factors methodology	Certified by Manager Council	Prior to start of Construction Works		N/A
Streamworks Ecological Compensation	Certified by Manager Council	Prior to Project becoming operational		N/A
Stormwater Operations and Maintenance	Provided to Manager Council for information	Prior to operation of stormwater treatment devices	N/A	Throughout operation of Project
Construction Air Quality	To Manager Council for Certification	Prior to start of construction works		Duration of Construction Works
<p>22 The Consent Holder shall develop, construct and maintain all ESC plans and devices to achieve the requirements of GD05, except where otherwise certified by the Manager Council or a specific standard is detailed in a condition of this consent, in which case the specific standard shall apply.</p>				
<p>24 The ESCP shall be prepared by a Suitably Qualified and Experienced Person and shall include the following:</p> <p><i>General</i></p> <ol style="list-style-type: none"> Methods of achieving the ESC Outcomes; Identification of a suite of appropriate structural and non-structural erosion and sediment control measures to be installed prior to and during all Construction Works for representative parts of the Project, including earthworks, and works within watercourses; 				

<p>c. Identification of a process and methods to ensure that offsite (clean) water runoff is prevented from entering active work areas, including the use of clean water diversion (CWD) channels and/or bunds to divert runoff;</p> <p>d. Identification of a process, methods and measures to ensure that any sediment laden runoff will be captured and directed to an appropriate sediment control device, including the use of dirty water diversion (DWD) channels and/or bunds;</p> <p>e. The approach and procedures for ensuring advance warning of a rainfall event;</p> <p>f. The methodology for identifying and recording the occurrence of the following rainfall events:</p> <ul style="list-style-type: none"> i. >24 hour 10-year ARI event in the Hoteo Inlet; and ii. >24 hour 30-year ARI event in the Mahurangi Harbour <p>g. The procedures for decommissioning the erosion and sediment control measures;</p> <p>h. The procedures for determining staging and sequencing of earthworks to limit the length of time and extent of exposed/disturbed soil and the details of progressive stabilisation of these earthwork areas;</p> <p>i. A procedure to establish and define minor changes to erosion and sediment control, which would not require further certification by the Manager Council prior to implementation; and</p> <p>j. Methods for amending and updating the ESCP as required.</p> <p><i>Responsibilities</i></p> <p>k. Identification of:</p> <ul style="list-style-type: none"> i. Appropriately qualified and experienced staff to manage the erosion and sediment control devices, associated maintenance procedures and monitoring requirements; ii. Staff directly responsible for supervising installation, maintenance and decommissioning of erosion and sediment control devices and the associated works; iii. A chain of responsibility for both the Project and its stages, including the overall manager (with authority to stop works), for managing erosion and sediment control on site; iv. An erosion and sediment control management team (including representatives from the contractor, Council and the Consent Holder) to meet and review erosion and sediment control practices and procedures as required; and 	<p>k - These should reference titles and not names as the names change constantly.</p> <p>k. iv. – I’m not sure what the purpose of “identifying” this team of people is? There will be regular compliance inspection of the</p>
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<p>v. Training requirements for staff to assist with their understanding of the environmental effects that need to be managed and the requirements of the consent conditions, including specific training prior at the start of Construction Works in any Stage.</p> <p><i>Incident management</i></p> <p>I. Identification of the process to ensure compliance with Condition 48 and 49.</p>	<p>earthworks and ESCs and the personnel will change, frequently.</p>
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Chemical Treatment Management

25 A Chemical Treatment Management Plan (ChemTMP) which shall include:

- a. Specific design details of the flocculation treatment system including:
 - i. a rainfall or flow activated flocculation ~~system shed~~ for all sediment retention ponds (SRPs), ~~decanting earth bunds (DEBs) and any other impoundment systems~~ utilised on site;
 - ii. Confirmation that all SRPs, DEBs or container impoundment systems, maintain a sufficient volume of chemical to provide appropriate flocculation throughout the duration of a 24 hour 30-year ARI event.
 - ii: ~~All SRPs having a contributing catchment area greater than 2ha to have two flocculation sheds;~~
 - iii: ~~A rainfall or flow activated flocculation shed for all decanting earth bunds (DEBs) utilised on site that have contributing catchments over 500m²; and~~
 - iv: ~~A rainfall activated flocculation system (such as flocculation socks) for all other decanting earth bunds and any other sediment detention or flow device system as may be employed on site;~~
- a. Monitoring, maintenance (including post storm) and a contingency programme (including a record sheet) for the flocculation treatment system;
- b. Results of any initial treatment trials and details of optimum dosage (including assumptions), ~~specific to a given CESP;~~
- c. Consideration of the use of organic flocculants where practicable, provided that the most effective flocculent in terms of sediment removal is be selected based on the results of any initial treatment trials;
- d. A spill contingency plan;
- e. Details of the person or bodies that will hold responsibility for the operation and maintenance of the chemical treatment system and the organisational structure which will support this system; and
- f. Details for the checking and calibration of dosing and monitoring equipment.

This should relate to having an appropriate amount of chemical available to last throughout a given storm event, not to the amount of sheds.

All DEBs and impoundment systems, including any with catchments less than 500m² should be subject to chemical treatment. All reference to “flocculation socks” should be removed.

<p>Erosion and sediment control standards</p> <p>26 The Consent Holder shall design and construct all erosion and sediment control measures and devices to achieve compliance with Conditions 22 and 24 and with the following design requirements:</p> <ol style="list-style-type: none"> All sediment retention ponds and decanting earth bunds shall be designed, constructed and maintained at a volume equivalent to or greater than 3% of the catchment area (i.e. 300m³ per 1ha of contributing catchment), unless otherwise varied through an approved CЕССР. Clean and dirty water diversion channels, shall be sized to accommodate the flow from 100 year ARI storm event where practicable; Sufficient and safe access to enable monitoring and maintenance (including forebay clean out) shall be provided at all times to all sediment retention ponds and decanting earth bunds. 	<p>In general, the level of detailed proposed in the CWMDR is of a higher standard than what is proposed here in the recommended conditions. All of the requirements as outlined in the CWMDR, such as forebay requirements, reverse slopes, pulley systems, maximum contributing catchments unless otherwise varied, etc., should be included in the ESC standards condition.</p>
<p>28 The CЕССРs shall be prepared by a Suitably Qualified and Experienced Person and shall contain:</p> <ol style="list-style-type: none"> Methods of achieving the ESC outcomes; Identify how the requirements of the certified ESCP and the standards in Condition 27 will be met (where applicable); and Include a schedule of current and planned open earthworks areas as applicable to that CЕССР catchment location at the time of preparation of that CЕССР. Identify alternative Stabilisation measures based on project-specific field trials to demonstrate its effectiveness in Stabilisation. The Project-specific trials and results must be submitted to the Manager in that CЕССР. Confirm catchment boundaries. 	<p>c. This isn't really relevant, and the site will be so dynamic that it wouldn't be accurate for much longer than a day or two anyway. It should be assumed that the whole catchment is open once the CЕССР has been approved.</p> <p>d. what's the purpose or putting this onto the contractor? If NZTA would like the contractor to do stabilisation trials, they could write it into their contract with the contractor.</p>

- f. Confirm the location of the Construction Works, and the boundary and extent of works for that specific CESC.
- g. Provide design criteria, typical and site-specific details of ESC measures, including supporting calculations, contributing catchment area, retention volume of structure, dimensions of structure and design drawings of erosion and sediment controls.
- h. Provide identification of risk and sensitive area locations and the details of management (including contingency measures) around these aspects.
- i. Confirm chemical treatment design and details consistent with the ChemTMP certified under the ESCP.
- ~~j. Provide a programme for managing ongoing non-stabilised areas.~~
- k. Provide design details for managing the treatment, disposal and/or discharge of contaminants (e.g. concrete wash water).
- l. Provide an estimated sediment yield for the Stage of work.
- m. Provide details of construction methods to be employed, including timing and duration. This shall include:
 - i. Streamworks methodologies;
 - ~~ii. Programme for managing exposed area, including progressive stabilisation considerations;~~
- iii. Identification of areas susceptible to erosion and sediment generation or high-risk areas including specific measures for managing this risk;
- iv. Access and maintenance provisions.
- n. Include plans showing contour information at suitable intervals, cut and fill operations, erosion and sediment controls, stream diversions, discharge points to Watercourses.
- ~~o. Provide procedures for decommissioning of ESC measures.~~
- ~~p. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).~~

- j. Management of ongoing non-stabilised areas should be via approval from the Council. A separate condition that requires any exposed areas which are not worked for a period of more than 14 days, to be stabilised to the satisfaction of the Council as exposed areas will always stay exposed unless requirement to stabilise or works are complete and open area limits need to be maintained.
- m. ii. Progressive stabilisation should be encouraged and a condition requiring stabilisation of an area if it's not worked for more than 14 days should be included. Requiring a "programme" isn't useful as it will constantly change.
- m. iv. Contingency measures for what?
- o. & p. decommissioning procedures are included in the ESCP as are the relevant personnel. Whomever is reviewing the CESC will know who the correct contacts are.

<p>CESSCP As-built certification</p> <p>29 That within 2 weeks of Prior to Construction Works in the Stage that the CESSCP applies commencing (excluding the construction of the erosion and sediment controls themselves) as-built plans signed by a Suitably Qualified and Experienced Person shall be submitted to the Manager Council for information as confirmation that the erosion and sediment control measures for that CESSCP have been constructed in accordance with the certified CESSCP.</p>	<p>'Prior to' rarely happens so including this wording means the contractor is always in non-compliance.</p>
<p>Adaptive Monitoring Programme</p> <p>30 Prior to Construction Works commencing, the Consent Holder shall have a certified Adaptive Monitoring Plan (AMP) to:</p> <ol style="list-style-type: none"> a. ensure the ESC Outcomes are met; b. enable accurate evaluation estimation of Acute Event Sediment and Cumulative Net Sediment yields throughout the duration of the earthworks phase of the Project Net-Sediment; and c. ensure continuous improvement as to the effectiveness of the erosion and sediment controls employed on site. 	
<p>32 The AMP shall be prepared by a Suitably Qualified and Experienced Person and shall include methods for undertaking:</p> <ol style="list-style-type: none"> a. Ongoing site visual assessments of all erosion and sediment devices; b. Ongoing monitoring of devices and processes, including flocculation; c. Identification of four representative SRPs or selected DEBs as approved by the Council; d. Automatic onsite rainfall monitoring using at least 2 or more, rain gauges, including automatic notification of a Trigger Event occurring; e. Pre-Trigger Event inspections including outlining maintenance procedures and installing any additional measures required in response to the severity of the forecasted Trigger Event (including Stabilisation); f. Trigger Event sampling, monitoring and response procedures in accordance with Conditions 34 and 36; 	<p>The AMP should also include baseline monitoring. A pre-construction baseline monitoring methodology should be developed to indicate the locations of any monitoring sites and the type of monitoring to be undertaken. That methodology should be prepared under the advice of ecology, water quality and earthworks specialists. The minimum typical parameters to be monitored should include:</p> <ul style="list-style-type: none"> • turbidity and clarity • sediment deposition • channel morphology and substrate composition.

- g. Outflow monitoring (measured in m³/sec) of the discharges of a representative number (at least four SRPs or DEBs) with:
 - i. two SRPs or DEBs to best represent a high-risk location of the earthworks on the Project (steeper locations or those with a catchment greater than 5ha); and
 - ii. two SRPs to represent the design and construction for general earthwork activities.
- h. Automatic sediment sampling at the same selected SRPs to measure outflow TSS (or an alternative water quality parameter that can be related to suspended solids concentrations).
- i. **Monitoring of TSS, or alternative water quality parameter that can be correlated to suspended solid concentrations, in the freshwater receiving environment, upstream and downstream of the most upstream and downstream discharges within the area of Project works in each of the Hoteo, Mahurangi and Oruwharo catchments; and**
- j. An analysis of the monitoring detailed in conditions 32(g) (flow) and 32(h) (TSS) to allow for calculation of cumulative sediment to the Hoteo, Mahurangi and Oruwharo catchments and for calculating Acute Event Sediment during the following events:
 - i. 24 hour 10-year or greater ARI event in the Hoteo Inlet (with a sediment load of >512 tonnes); and
 - ii. 24 hours 30-year or greater ARI event in the Mahurangi Harbour (with a sediment load of >600 tonnes).

Monitoring effects of a Trigger Event Procedures

33 ~~During~~ Within 12 hours of a Trigger Event occurring, the Consent Holder shall complete a Trigger Event monitoring programme which includes the collection of ~~take~~ grab samples (unless it shall be unsafe or dangerous to do so) to measure TSS, or alternative water quality parameter that can be related to suspended solid concentrations, at discharge points of all SRPs and a selection of DEBs (a minimum of 50% of the operational DEBs) at the time of a discharge, and in the freshwater receiving environment, upstream and downstream of the area of Project Works in each of the Hoteo, Mahurangi and Oruwharo catchments. During Trigger Event monitoring the Consent Holder shall instruct a Suitably Qualified Person to undertake the following additional procedures:

c. My experience on P2Wk is that sometimes SRPs cannot be used or the data isn't useful. DEBs are sometimes better and represent a more accurate sediment yield overall as not all devices are as efficient as SRPs.

d. P2Wk has 3 rain gauges to limit AMP sampling in sub-catchments where much less rain has fallen.

i. The intent of this is to monitor TSS upstream of earthworks at the designation boundary (or similar) and at downstream location not necessarily connected to a given CЕСP.

<p>a. Inspect and record observations of the earthworks site and erosion and sediment control devices to identify any problems or activities likely to have contributed to an increased sediment discharge.</p> <p>b. Remedy any identified problems, and implement any further controls on activities or areas of the site that are likely to contribute to sediment discharge into the receiving environment; and</p> <p>c. Notify the Council of the Trigger Event occurring, and any actions undertaken.</p>	
<p>34 Within 12 hours of a Trigger Event occurring, or as soon as practicable, the Consent Holder shall investigate erosion and sediment control measures to determine whether there has been a discharge.</p> <p>34 With 2 weeks of Trigger Event Procedures having been undertaken, provide the Council with an Adaptive Monitoring Programme Report (AMP Report), summarising the TSS results, or alternative water quality parameter that can be related to suspended solid concentrations, of the automatic and grab samples collected during the Trigger Event, including any observations made and actions taken to remedy improper ESC device performance.</p> <p>35 In the event of a discharge occurring as a result of a Trigger Event, the Consent Holder shall instruct a Suitably Qualified Person to take the following actions:</p> <p>a. Inspect the earthworks site and erosion and sediment control devices to identify any problems or activities likely to have contributed to an increased sediment discharge;</p> <p>b. Take a grab sample of each discharge from a sediment control device to determine TSS, or alternative water quality parameter that can be related to suspended solid concentrations, (unless it will be unsafe or dangerous to do so);</p> <p>c. Record observations and take a manual grab sample that can be related to suspended solid concentrations^{5,7}, or alternative water quality parameter that can be related to suspended solid</p>	<p>34. This is redundant. If a trigger event occurs, sampling will be required and if devices are discharging they will collect samples, and if devices aren't, they will be recorded as not discharging.</p> <p>35. covered by 33.</p>

<p>concentrations, in the freshwater receiving environment, upstream and downstream of the most upstream and downstream discharges within the area of Project Works; and</p> <p>d. Remedy any identified problems, and implement any further controls on activities or areas of the site that are likely to contribute to sediment discharge into the receiving environment; and</p> <p>e. Notify the Manager of the Trigger Event occurring, and any actions undertaken.</p>	
<p><i>Sediment reduction activities</i></p> <p>37 Where there is Acute Event Sediment and/or Cumulative Sediment (greater than zero) (determined using the data collected from the representative SRPs or DEBs as required by conditions 37 to 42), the Consent Holder shall:</p> <ol style="list-style-type: none"> a. for Acute Event Sediment, implement Sediment Reduction Activities to offset the effects of that sediment within 25 years of the date of the Acute Event that caused the Acute Event Sediment; and b. For Cumulative Sediment, implement Sediment Reduction Activities to offset the effects of that sediment within 25 years of the Project becoming operational. 	
<p>41 The following information shall be provided to the Council within six months of the date of an Acute Event occurring to demonstrate how condition 37(a) will be met:</p> <ol style="list-style-type: none"> a. A record of the Acute Event Sediment including any exceedance beyond the Acute Event Thresholds for each catchment. b. Documentation outlining the location where Sediment Reduction Activities have been applied and how they will offset the Acute Event Sediment within 25 years of the relevant Acute Event. 	<p>If an Acute Event happens and the thresholds are not exceeded, what happens?</p>

<p>Earthworks Season Restrictions</p> <p>43. The Consent Holder shall not undertake earthworks activities between 30 April and 1 October 1 May and 30 September (winter period) in any year unless otherwise approved by the Manager Council.</p>	
<p>45. Unless otherwise approved in writing by the Council, accordance with condition 46, the Maximum Open Earthworks Area for Project Works within the Oruawhoro catchment at any one time is 25ha; the Maximum Open Earthworks Area for Project Works within the Mahurangi catchment at any one time is 43.3ha; and, the Maximum Open Earthworks Area for Project Works within the Hotoe catchment at any one time is 75ha</p>	<p>I recommend that these limits apply to December – March and that they are decreasing by April. The reason being that stabilisation procedures takes quit a bit more time than is expected due to weather. If they are required to start stabilising in March instead of April, they will have a better chance of meeting any open area targets.</p>
<p>46. Any request to the Manager Council for approval to open an earthworks area that is greater than the limits stated in conditions 45 75ha within the Hotoe catchment and/or 25 ha within the Oruawhoro catchment, shall include the following information:</p> <ol style="list-style-type: none"> The proposed earthworks programme and ESC measures implemented; A comparison showing the modelled sediment yields compared to the actual sediment yields generated to date; A minimum of 12 months of Monitoring data to support an increased earthworks area including –This must include water quality results from the AMP, at least four automated sampling devices that gathered data from a comparable catchment; and –Identification of areas for continuous improvement opportunities (e.g. modifications to current ESC practice) for future earthworks. 	<p>Any approval to increase open areas will be for the most part, based on compliance. Optimizing ESC measures will be a matter of course throughout the project works as well as a requirement of the AMP.</p>
<p>Incident Management</p> <p>48 The Consent Holder shall notify the Manager Council within one Day or as soon as practicable after identifying that any contaminants (including sediment) or materials</p>	<p>There should be an “Incident Management” condition that outlines what actions need to take place if there’s an uncontrolled sediment discharge incident. i.e., pond incident at CN14.</p>

<p>that exceed typical background levels have been released in the undertaking of the Work and which have entered any water body due to any of the following incidents:</p> <ol style="list-style-type: none"> discharges from non-stabilised areas that are not treated by erosion and sediment control measures as required under this consent; and/or failure of any erosion and sediment control measures; discharge of a hazardous substances, including cement, to a water body; failure of any temporary stream diversion; un-consented removal, loss or damage to vegetation or other habitats; any other incident which either directly or indirectly causes, or is likely to cause, adverse ecological effects in any water body that is not authorised by a resource consent held by the Consent Holder; and Any other incident which is likely to adversely affect the quality of the water used for public reticulated water purposes. <p>This notification shall be either by telephone or email, or via an alternative method as agreed with the Manager Council.</p>	
<p>Completion or abandonment of works</p> <p>52 Upon completion or abandonment of earthworks on the Project site, including end-of earthworks-season, the Consent Holder shall stabilise all areas of bare earth shall be Stabilised against erosion to the satisfaction of the Manager Council.</p> <p>53—The Consent Holder shall give notice to the Manager on completion of Construction Works for each specific area and/or activity and prior to any ESC measures being removed.</p>	<p>Condition 53 serves no purpose. There will be a procedure for removal of controls (in the overarching ESCP) and works in a specific area won't be "finished" until the whole project is finished. i.e., there are often additional works in areas that have been "completed".</p>
<p>58 The Consent Holder shall design and construct all stream diversions to have natural stream forms and riparian planting where the diverted streams are permanent and supporting fish habitats. The stream diversions shall be designed by Suitably Qualified and Experienced Persons.</p>	<p>This is clunky and unnecessary. Any permanent stream diversion will be constructed to maximise its ecological benefit because every last metre of stream channel, be it diverted or otherwise, will be subject to enhancement measures to address the effects associated with stream loss.</p>

<p>Design certification – permanent structures in Watercourses and Wetlands</p> <p>61 The Consent Holder shall provide drawings of the detailed design of permanent bridges, culverts, and stream diversions to be constructed in or over Watercourses and Wetlands, to the Manager Council for certification at least 30 Days prior to the start of construction of the relevant structures. The drawings shall be accompanied by a written report prepared by a Suitably Qualified and Experienced Expert setting out how the design requirements of conditions 54 and 56 to 61 have been met and the rationale for any departures from those requirements. If a response has not been received from the Manager within 20 Days following the submission of the design, the design shall be deemed to be certified. The Consent Holder shall construct the Project in general accordance with the certified design.</p>	<p>What is the purpose of this condition? There are going to be hundreds of design changes to any number of structures in, over, or under a watercourse or wetland. Is this process to be repeated for every design change? Suggest this information is provided in an “as-built” with ongoing monitoring of all stream related structures to keep track of “ecological loss” and to maintain a running total of what’s required / is available within designation from an “ecological gain” point of view.</p>
<p>Diverting Watercourses</p> <p>69 Prior to Project Works within a Watercourse, including the filling of the bed, the Consent Holder shall put in place a diversion or diversions around the area of Project Works for all flows with a primary capacity up to the 20-year ARI flood event, unless an alternative design is certified by the Council.</p> <p>70 During weather events in excess of the 20-year ARI flood event, up to the 100-year ARI flood event (i.e. flows are greater than the capacity of the existing diversion), the Consent Holder shall put in place a stabilised flow path to minimise the potential for scour or erosion and allow flows to pass safely around or through the area of Project Works with minimum nuisance, damage and sediment generation or discharge.</p>	<p>These measures should form part of a given CЕСCP</p>

As-built certification

71 The Consent Holder shall provide as-Built Plans certified by a Chartered Professional Engineer confirming that permanent structures in and over Watercourses have been constructed in accordance with the certified design under condition 63 to the **Manager Council** within 90 Days of completion of the Construction Works.

Technical Memo – Specialist Unit

To: Nicola Holmes – Principal Specialist Planning, Processing Planner

From: Mark Lowe – Streamworks Consultant to the Earth, Streams and Trees team, Specialist Unit, Resource Consents

Date: 18/8/2020

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name: Waka Kotahi – New Zealand Transport Agency (NZTA)

Application number: BUN60354951, LUS60354955

Activity type: Streamworks

Description: Resource consent application for the Warkworth to Wellsford section of the Ara Tuhono Motorway. Construction of an approximately 26 km section of state highway including stream diversion, culverting and wetland reclamation.

Site address: Various

2.0 PROPOSAL, SITE AND LOCALITY DESCRIPTION

2.1 Scope of Technical Memo

1. This Technical Assessment considers the application with regards to actual and potential effects on freshwater ecology resulting from the proposed activities in, on under or over the bed of rivers streams and wetlands, with reference to chapter E3 of the Auckland Unitary Plan: Operative in Part (AUP:OP). The Technical Assessment also considers the proposed 'effects management package' including measures to avoid, mitigate, offset and compensate adverse effects.
2. The following are assessed by separate Council Specialists:
 - Construction methodology for streamworks, effects of sediment discharge, and the proposed erosion and sediment controls.
 - The effects of surface water diversion, with reference to chapter E7 of the AUP:OP.
 - The effects of stormwater and contaminant discharge from the ongoing operation motorway.
 - Effects on terrestrial ecology, including on wetland avifauna and herpetofauna.
3. I undertook a site visit on the 8th of July 2020 to view the proposed designation extent and indicative alignment from key accessible points.

2.2 Proposal Relevant to this Consent Only

4. The applicant is seeking streamworks consent for works involving the construction and ongoing use of new structures in, on under or over the bed of lakes, rivers, streams (including intermittent streams) and wetlands, including associated bed disturbance, deposition of substances, reclamation, diversion of water and incidental temporary damming of water, and enhancement. Including the following:
 - Road embankments placed over streams and wetlands;
 - Soil disposal placed over streams;
 - Bridges over the Mahurangi and Hoteo Rivers, as well as, Waitaraire Stream, Maeneene Stream and Kourawhero Stream;
 - Culverts and culvert extensions exceeding 30 m in length outside overlays;
 - Stormwater outfalls and erosion protection structures (within the overlays relevant to E3);
 - Temporary structures associated with the construction of bridges across the Mahurangi and Hoteo Rivers (including within the overlays relevant to E3).

5. It is noted that:
 - No culverts exceeding 30 m in length are proposed within overlays.
 - No reclamation is proposed for streams and wetlands that may be present within soil disposal sites¹.
 - No activities are proposed that do not comply with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.10 to E3.6.1.12 and E3.6.1.14 to E3.6.1.23 within overlays.

6. Based on the indicative alignment presented and the application material, the above activities are estimated to result in:
 - 2.98 ha² of wetland reclamation (Appendix H of the EclA³), comprised of:
 - o 0.64 ha of 'high' – 'very high' value wetland.
 - o 2.34 ha of 'low' – 'moderate' ecological value wetland.
 - The loss or modification to approximately 27 km of watercourse. This is comprised of culverting, stream diversions, as well as, stream loss associated with the diversions (excluding soil disposal sites). These effects are summarised in table 1 below.

7. The s92 response part 2 states that there is approximately 5.42 Km of watercourse within the indicative soil disposal sites. It is noted that the EclA has not assessed the effects on the freshwater environment associated with the indicative soil disposal sites, including the potential

¹ However, as discussed below, the indicative soil disposal sites shown on the construction water drawings are shown in locations of identified wetlands.

² The s92 response part 2 indicates that the applicant considers the area HN_T_Hoteo_03a a wetland; this is not reflected in the revised Appendix H (of the EclA). Thus, a further 0.579 ha of high value wetland is being impacted by the indicative alignment according to the s92 response. Therefore, the areas of reclamation should be reported as 1.223 Ha of high – very high value wetland and 3.563 ha total.

³ Updated Appendix H of the EclA provided as part of s92 response part 2.

loss of stream length though proposed diversions or the potential loss of ecological function and habitat availability thought reduction in groundwater inputs (s92 response part 2). In addition, it is not clear from the application material presented to date how this activity can be undertaken without some degree of stream reclamation occurring. These matters are discussed further in this Technical Assessment.

Table 1: Estimated loss and modification to watercourses (excludes soil disposal sites)

Zone	Total Stream Impact (Km) (permanent and intermittent)	New Culvert Length (Km) (included in total impact)	Stream Impact Excluding Culverts (Km) (impacted by diversions)	New Diversion Length (Km) (excluding cut of drains)	Resulting Loss of Stream Length (Km)
Warkworth North	4.5	0.8	3.7	4.4	+0.7 (increase)
Dome Valley	9	2.9	6.1	4.5	-1.6
Hoteo North	13.6	2.6	11	9.4	-1.6
Total	27.1	6.3	20.8	18.3	-2.5

8. Based on the indicative alignment presented and the application material the proposed enhancement actions that form offsetting of residual adverse effects is described as:
- Wetland enhancement at a ratio of 1:6 for wetland area assessed as 'high' and 'very high' ecological value and 1:3 for wetland area assessed as 'low' – 'moderate' ecological value, resulting in an estimated total of 11.25 ha of wetland enhancement.
 - 71 km of stream riparian enhancement (comprising 10.1 km in Warkworth North; 9 km in Dome Valley; and, 13.5 km in Hoteo North).
 - o The applicant asserts that the newly created diversions will achieve ecological values and function at least equivalent to that of the potential value of those streams lost. The offsetting noted above is in addition to the mitigation provided through diversion of watercourses.
9. The offsetting actions described above do not address adverse effects associated with the indicative soil disposal sites.

2.3 Relevant Documents

10. A description of the proposal relevant to the streamworks application is provided in the following application documents and s92 responses:

- Assessment of Effects on the Environment: Warkworth to Wellsford Project. Prepared by Karyn Sinclair. Dated March 2020 (herein referred to as the AEE).
- Ara Tūhono Project, Warkworth to Wellsford Section; Ecology Assessment. Prepared by Boffa Miskell. Dated July 2019 (herein referred to as the EclA).
- Freshwater Site Map Series. Drawings ES-050 – ES-054. Dated July 2019.
- Ecological Assessment Terrestrial Values Map Series. Drawings EV-001 – EV-006 Dated July 2019.
- Priority Ecological Sites Map Series. Drawings PES-010 – PES-043. Dated July 2019.
- Landscape and Ecological Mitigation Map Series. Drawings EM-010 – EM-015. Dated July 2019.
- Memorandum: Notice of Requirement and Resource Consent Applications – response to Auckland Council’s request for further information. Dated 3 August 2020. (herein referred to as the s92 response part 2).

2.4 Site Description

11. These site descriptions provided in the AEE and EclA have been crossed-referenced with a site visit and are considered appropriate and adequate to make an informed assessment of the freshwater ecological effects of the proposed activities.

3.0 REASON FOR CONSENT – STREAMWORKS

12. The AEE identifies the following reasons for consent (AUP:OP):
13. Activities involving the diversion of a river or stream to a new course including any associated disturbance and sediment discharge:
 - E3.4.1 (A19): Diversion of a river or stream to a new course and associated disturbance and sediment discharge (outside overlays) – **Discretionary**.
14. Works on structures lawfully existing on or before 30 September 2013 and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water:
 - E3.4.1 (A26): any activities not complying with the general permitted activity standards in E3.6.1.1 or the specific activity standards in E3.6.1.10 – E3.6.1.13 (outside overlays) – **Discretionary**.
15. New structures and the associated bed disturbance or depositing any substance, reclamation, diversion of water and incidental temporary damming of water:
 - E3.4.1 (A27) Temporary structures complying with standards in E3.6.1.15 (within overlays) – **Discretionary**.
 - E3.4.1 (A29) Bridges or pipe bridges complying with the standards in E3.6.1.16 (within overlays) – **Discretionary**.
 - E3.4.1 (A33) Culverts or fords more than 30m in length when measured parallel to the direction of water flow (outside overlays) – **Discretionary**.

- E3.4.1 (A34) Erosion control structure less than 30m in length when measured parallel to the direction of water flow complying with the standards in E3.6.1.14 (outside overlays) – **Discretionary.**
 - E3.4.1 (A39) Stormwater or wastewater outfall complying with the standards in E3.6.1.14 (within overlays) – **Discretionary.**
 - 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 (outside overlays) – **Discretionary.**
16. In the context of the current consent application, and council interpretations at the time of this Technical Assessment, the above reasons for consent are considered appropriate. However, while the application includes seeking consent for diversions associated with soil disposal sites (AEE; pg 120), the applicant is not applying for consents for the reclamation of watercourses associated with the indicative soil disposal sites. Given the length of watercourse present within some of the indicative soil disposal sites (5.42 Km) it is uncertain how this activity could be undertaken without stream reclamation occurring and further clarity on this matter from the applicant may be warranted.
17. It is considered by this Technical Assessment that diversion channels that are formed on top of soil disposal sites following the loss of the original watercourse, and completion of the fill activity, are more appropriately considered reclamations rather than diversions. This interpretation is based on the timing of the creation of the new channel relative to the loss of the original watercourse, as well as, the potential loss of ecological function and habitat availability though reduction in ground water inputs into vertically lifted channels. It is also noted that the application does not consider cut off drains and vertically lifted channels to contribute towards the mitigation or offset quantum, acknowledging that in such situations ecological value and function can be limited.
18. Additionally, indicative soil disposal sites are shown on the construction water drawings in the location of identified wetlands, for example CW-13 shows an indicative soil disposal site over wetland WN_W_Koura_01; and CW-26 shows an indicative soil disposal site over wetland HN_W_TeHana_01. It is uncertain how this activity could be undertaken without wetlands reclamation occurring, and how these wetlands could be practically diverted while retaining, hydrological, ecological and functional values. Again, further clarity on this matter from the applicant may be warranted.
19. Acknowledging that the soil disposal sites shown on the construction water drawings are indicative only, and due to the lack of detail in the application material as to how reclamation of wetlands and streams will be practically avoided; it is considered necessary to recommend a condition of consent ensuring that soil disposal does not result in the reclamation of streams and wetlands.
20. I have undertaken a brief review of the National Environmental Standards for Freshwater published on 3 August 2020, which becomes effective (in part) on 3 September 2020. The wetland and stream provisions do not alter my comments within this Technical Assessment at the time of writing. However, updates or amendments may be required later upon closer review and direction from Council.
21. It is noted that the project drawings submitted as part of the application include the location of an indicative forestry track realignment. This track is shown to traverse several identified ecological areas, including wetlands: WN_W_Koura_01 and WN_W_Koura_03. It is understood

from the s92 response part 2, that the activity of constructing this realigned track does not form part of the current consent application and any consents (if required) will be sought subsequently following confirmation of the location of the forestry track. Effects of the forestry track realignment through the wetland areas has not been assessed as part of the EclA.

4.0 TECHNICAL ASSESSMENT OF EFFECTS

22. This Technical Assessment finds largely agrees with the applicants reporting of existing ecological values for those sites that were able to be accessed for field survey.
23. The following discussion will focus on the following:
 - Matters of technical concern which should be noted, however, are not of sufficient scale to fundamentally change to opinion and conclusions of this Technical Assessment (Matters to Note).
 - Matters of technical concern that remain outstanding following the s92 responses and are required to be resolved for this Technical Assessment to be able to support the granting of the consent (Outstanding Matters).

4.1 Matters to Note

4.1.1 Inconsistency in Reporting

24. There are inconsistencies in reporting resulting from the s92 response part 2 and the associated updated SEV calculations and Appendix H table.
25. The s92 response part 2 and the associated updated Appendix H table indicate a total area of wetland reclamation as 2.98 ha, comprising 0.64 ha of 'high' – 'very high' value wetland and 2.34 ha of 'low' – 'moderate' value wetland. However, despite the S92 response for freshwater question 5d indicating the applicant considers the HN_T_Hoteo_03a a wetland; this is not reflected in the revised Appendix H (of the EclA). Thus, a further 0.579 ha of 'high' value wetland is being impacted by the indicative alignment according to the s92 response. Therefore, the areas of reclamation should be reported as 1.223 ha of 'high' – 'very high' value wetland and 3.563 ha total.
26. The recommended conditions of consent allow for the extent of wetland to be delineated following detailed design and certified by Council; therefore, it is possible to apply any necessary corrections at that point. However, the discrepancies noted will need to be considered if recommended limits to adverse effects are adopted (discussed below).
27. In addition, despite the S92 response for 9b indicating the SEV calculator has been updated for Vrough and Vripar variables of Hoteo_3_post-harvest, this change is not reflected in the updated SEV calculations. This is likely to affect the calculated quantum of offset.
28. The recommended conditions of consent allow for the calculation of stream offset quantum to be calculated following detailed design and certified by Council; therefore, it is possible to apply any necessary corrections at that point.
29. These inconsistencies are minor relative to the scale of the application and do not impact on the outcomes of this Technical Assessment.

4.1.2 Confidence in Availability of Offset Enhancement Sites

30. Based on the indicative alignment and the application material an estimated 71 Km of stream length is required for offsetting. The EclA presents that there is approximately 118 km of watercourse available for offset actions to be undertaken within the designation.
31. This estimation assumes that the Dome Valley Forest Section will have been subject to forest harvest, and the stream margins will be available for enhancement planting, at the time of the project construction.
32. The s92 response part 2 outlines that should Dome Valley Forest Section not be harvested at the time of construction then the 38.5 Km of stream within this section expected to be available for offset actions will not be available, leaving 79.6 Km for offset enhancement within the Warkworth North and Hoteo North Sections.
33. Updated estimates of offset requirements under the scenario that the Dome Valley Forest Section is not harvested at the time of construction (s92 response part 2) indicate that 78.2 Km of offset will be required. This is only 1.4 Km less than the 79.6 Km available under this scenario.
34. Indicative soil disposal sites are shown in the construction water drawing set (particularly drawing CW-17 and CW-18). The EclA has not assessed the effects on the freshwater environment associated with the disposal of soil in the indicative soil disposal sites, including the potential loss of stream length through proposed diversions or the potential loss of ecological function and habitat availability through reduction in ground water inputs (s92 response part 2).
35. It is considered by this Technical Assessment that further offset will be required to address adverse effects on the freshwater environment associated with the soil disposal within the indicative soil disposal sites.
36. Furthermore, the s92 response part 2 states that the reported watercourse available for offset (118 km; or 79.6 if the Dome Valley Forest Section is not harvested at the time of construction) includes the watercourses within the location of the indicative soil disposal sites – Which may in fact no longer be available for offset following soil disposal activities.
37. The s92 response part 2 states that, where appropriate, diverted streams for the soil disposal sites can be used for enhancement areas. Owing to the nature of the soil disposal activity diversions in these locations are likely to be vertically elevated. Therefore, this statement would appear somewhat contrary to the application approach whereby cut off drains and vertically elevated diversions are not considered towards mitigation or offset.
38. Therefore, in summary, there is some doubt as to the certainty that the adverse effects on streams can be sufficiently offset within the proposed designation. This conclusion is due to:
 - a. The lack of consideration of assessment of actual or potential adverse effects associated with the soil disposal sites and any additional offset that may be required. The s92 response part 2 states: *“At the time of the ecology assessment, the soil disposal areas were excluded from the application and have not been assessed for ecological impact”*.
 - b. The fact the reported watercourses available for offset include watercourses within the indicative soil disposal sites.

- c. The potential impacts of offset quantum requirements and offset site location availability is the Dome Valley Forest Section is not harvested at the time of construction

4.1.3 Out of Kind Offsets

39. The EclA considers that offsetting of stream loss could take the form of rehabilitated wetland areas, on a case-by-case basis. This is not consistent with the AUP:OP policy E3.3(4) as it is not considered like for like. Such an approach would need to clearly demonstrate adherence to the 'effects management hierarchy' and preferably demonstrate a 'trade-up' offset outcome.
40. It is considered more appropriate to deal with such offset proposals that are contrary to AUP:OP objective and policies prior to granting consent rather than deferring through conditions of consent.
41. The s92 response part 2 confirmed that 'trading up' from streams to wetlands is not currently proposed as part of the 'effects management package' of the project.
42. Given that out of kind (not like for like) exchanges are not anticipated, it is considered necessary to ensure that the inclusion of the reference made in the EclA is not relied upon to manage effects following the granting consent. Therefore, an advice note to this effect is recommended.

4.1.4 SEV Impact Value

43. Auckland Council Technical Report 2011/009 outlines a process by the Stream Ecological Valuation (SEV) method can be used to offset residual adverse effects through the calculation of Environmental Compensation Ratios (ECRs)⁴.
44. The ECR calculations to estimate the quantum of offset required applies an SEV score for the impacted values (SEV i-I) of 0.2 across all impacted watercourse. This score is appropriate for the length of impacted stream that is proposed to be culverted.
45. In addition to culverting, the application also proposes to divert watercourses. The diversions result in two different outcomes:
- a length of watercourse that is lost and then recreated elsewhere through the diversion (18.3 Km).
 - a length of watercourse that is lost due to the proposed diversions having less total length than the existing watercourses (2.5 Km).
46. An SEV i-I score of 0 is more appropriate for the length of impacted stream that is to be diverted or lost. The ECRs can then be derived separately for each scenario: the diversion addressed through the ecological functional gain predicted for the new channels; and the loss of stream addressed through the ecological gain predicted by the proposed offset enhancement.

⁴ Storey, R.G., Neale, M.W., Rowe, D.K., Collier, K.J., Hatton, C., Joy, M.K., Macted, J. R., Moore, S., Parkyn, S.M., Phillips, N. and Quinn, J.M. (2011) Stream Ecological Valuation (SEV): a method for assessing the ecological function of Auckland streams. Auckland Council Technical Report 2011/009.

47. It is the opinion of this Technical Assessment that the ECR calculations presented by the applicant could have been done in a more transparent manner. However, in undertaking independent calculations, the resulting outcome is that the offset requirements estimated by the applicant are greater than those calculated under the alternative approach.
48. It is considered that the proposed conditions of consent allow for more transparent calculations to occur at the time of confirming the level of adverse effect and the calculated offset quantum, and for these to be certified by Council.
49. Of note, the s92 response part 2 presumes there will be no true stream loss, with all streams either diverted or culverted. However, based on the application material 2.5 km of stream length loss will occur as a result of the diversions across the project alignment (as a result of the overall diversion length being less than the impacted stream length).

4.1.5 Benefits Attributed to Diversions in Offset Calculations

50. Notwithstanding concerns noted above, in quantifying the anticipated length of offset required (71 Km) the applicant has subtracted the lengths of diversions (18.3 Km) from the length of offset estimated when considering the full stream impacts (89.4 Km).
51. In calculating the anticipated length of offset required when considering the full stream impacts the applicant has used SEV potential scores for the offset assuming 20 m of riparian planting has occurred on each bank⁵ (EclA; pg. 164).
52. The diversions are proposed to include riparian vegetation extending 10 m on either side of the channel (EclA; pg. 160).
53. Therefore, the benefits offered by the proposed diversions in reducing the overall quantum of offset required has been over estimated.
54. As above, it is considered that the proposed conditions of consent allow for more transparent calculations to occur at the time of confirming the level of adverse effect and the calculated offset quantum, and for these to be certified by Council.

4.1.6 Lapse Date

55. The application is proposing a consent lapse date of 15 years for the activities resulting in diversion of watercourses and reclamation of wetlands.
56. Due to the indicative nature of the alignment there is a corresponding level of uncertainty regarding the actual quantum of residual adverse effects on watercourses and wetlands within the designation following detailed design.
57. To manage the residual adverse effects the applicant is proposing to:

⁵ The SEV m-P values calculated for Korura_1_MIT, Hoteo3 Post Harvest Potential, and TeHana_6_MIT score a 1 for SEV variables Vripar and Vrough (low diversity regenerating forest), indicating vegetated riparian margins of 20 m on each bank.

- Offset adverse effects on watercourse through the use of the SEV and ECR methods as set out in Auckland Council Technical Reports (TR2011/009 and TR2016/23)⁶.
- Offset effects on wetlands through the use of predetermined and standardised ratios (1:3 for 'low' to 'medium' ecological value wetlands and 1:6 'high' to 'very high' value wetlands).

58. This requires the applicant to survey the actual impact sites, following detailed design, at a time reasonably prior to the physical impact. This allows the proposed process to address any positive or negative change in ecological value that may occur between granting of the consent (if granted) and the adverse effect occurring.
59. Notwithstanding concerns regarding the justification of the wetland offset ratios, specifying the wetland offset ratios and the stream offset methods provides some certainty. However, given the lapse date sought it is possible that best practice and accepted industry offsetting may change over the intervening period.

4.1.7 Use of the Term Mitigation

60. The management of adverse effects under the RMA can be represented as a continuum of responses: avoidance, mitigation and remediation, offsetting, environmental compensation, and lastly other forms of compensation. This hierarchical approach to managing effects is further supported by the AUP:OP policies and objectives, including objective E3.2.3.
61. The continuum reflects that offsetting should be considered after avenues to avoid, remedy, or mitigate have been exhausted; and environmental compensation only considered thereafter.
62. The EclA has collectively referred to all aspects of the effect's management hierarchy as 'mitigation' (EclA; pg. 136).
63. This approach makes it difficult to ascertain what measures the applicant considers to be avoidance, remediation, mitigation, offset or compensation.
64. Furthermore, draft conditions are proposed by the applicant, on an Augier basis, to counterbalance the adverse effects of wetland and stream loss, and residual adverse effects from diversion, through enhancements to retained wetlands and streams within the designation. The proposed conditions refer to these actions as mitigation.
65. It is the opinion of this Technical Assessment that these actions are not 'mitigation' as they do not alleviate, nor abate, nor moderate the severity of the impacts; nor are they located at the point of impact⁷. It is considered more appropriate to refer to these actions as offset (or environmental compensation if no measurable justification of the ratios used is provided). Therefore, amendments to the draft conditions have been recommended.

4.1.8 Native Fish Salvage and Relocation

⁶ Neale, M W., Storey, R G and Quinn, J L (2016). Stream Ecological Valuation: application to intermittent streams. Prepared by Golder Associates (NZ) Limited for Auckland Council. Auckland Council technical report, TR2016/023.

⁷ *Royal Forest and Bird Protection Society of New Zealand v Buller District Council and West Coast Regional Council and others*, [2013] NZHC 1346, Fogarty J.

66. The proposed streamworks activities, including diversions and culvert installation, have the potential to result in direct injury or mortality of native fish present.
67. The draft conditions recommend by the Applicant included the requirement to undertake a survey for the presence of native fish prior to Project Works, and if present have a suitably qualified person to capture and relocate native fish to mitigate the adverse effect of injury and mortality.
68. The conditions as proposed do not consider the time lag between the survey and the relocation exercise and the risk of not detecting fish presence at the time of the survey that are later present during physical works. Furthermore, the conditions as proposed do not allow for Council to certify the native fish capture and relocation methodology.
69. The applicants EclA recommends that Native Fish Relocation Plan (NFRP) should be prepared and certified prior to any streamworks. Recommended amendment to the proposed conditions are provided to achieve this outcome.

4.2 Outstanding Matters

4.2.1 Soil Disposal Site Effects

70. The application includes seeking consent for diversions associated with soil disposal sites (AEE; pg. 120). The proposed diversion has the potential to cause adverse effects through loss of stream length and the loss of ecological and hydrological function (including spatial and temporal habitat availability) through any vertical lifting of channels and reduction in base flows. Of particular concern, due to their size and length of watercourse within, are the soil disposal sites shown on construction water drawings CW-17 and CW-18.
71. Indicative soil disposal sites are also shown on the construction water drawings in the location of identified wetlands, for example CW-13 shows an indicative soil disposal site over wetland WN_W_Koura_01; and CW-26 shows an indicative soil disposal site over wetland HN_W_TeHana_01.
72. The EclA has not assessed the effects on the freshwater environment associated with the disposal of soil in the indicative soil disposal sites, including the potential loss of wetlands, the potential loss of stream length through proposed diversions or the potential loss of ecological function and habitat availability through reduction in ground water inputs (s92 response part 2: *“At the time of the ecology assessment, the soil disposal areas were excluded from the application and have not been assessed for ecological impact”*).
73. Therefore, not all actual or potential adverse effects associated with the proposed activity have been considered and assessed by the EclA.

4.2.2 Limited and Representative Assessment

74. The EclA provides an assessment of 16 watercourses. Two of which were assessed visually from a distance due to access restrictions.
75. The EclA considers that the Auckland Council OLFP layer predicts the transition points between ephemeral, intermittent and permanent stream, using the contributing catchments sizes:

- 0.2 – 0.4 ha (ephemeral), 0.4 – 3 ha (intermittent), and greater than 3 ha (permanent). This assumption is incorrect.
76. While acknowledging limitations⁸, a study to estimate the length of watercourse in the Auckland region⁹, indicates that (in Waitamata sandstone) an intermittent stream will initiate with a catchment size of 1.68 ha and a permeant stream at 2.8 ha. Therefore, the estimates of stream length used in the EclA are likely to overestimate the length of intermittent stream (both in terms of impact and offset availability).
77. The EclA acknowledges that due to access restrictions some wetland assessments had to be undertaken visually from a distance and that only a representative range of moderate and low value sites were assessed, particularly in the Hoteo North section. The EclA considers that the assessments provide a good description of the existing wetland characteristics (EclA; pg. 67).
78. It is not clear from the application material how the extent of wetlands were delineated.
79. Therefore, there is some uncertainty around the actual level of adverse effect on wetlands and whether all wetlands within the proposed designation and indicative alignment have been appropriately delineated.
80. This level of assessment is considered to be appropriate to understand the board scale and nature of ecological values and adverse effects across a project of this scale with the compounding issue of only being presented with an indicative alignment. However, it does place additional importance on robust assessment following detailed design and prior to the adverse effects occurring to understand the level of adverse effect and the required quantum of offset.
81. To ensure this outcome is achieved it is recommended that the conditions of consent allow for Council to certify:
- the survey of stream and wetland extent to be impacted by the final design.
 - the assessment of the ecological values at the time of the survey.
 - the calculation of the required quantum of offset.
82. This requires the conditions to be worded with clear measures for which Council to certify against.

4.2.3 Limits to Adverse Effects

83. An indicative alignment has been presented and used for the assessment of ecological effects. As noted above, there is a corresponding level of uncertainty regarding the actual quantum of residual adverse effects on watercourses and wetlands within the designation following detailed design.

⁸ The study by Storey and Whadwa (2009) was primarily undertaken to assess the length of different streams classes (permanent, intermittent and ephemeral) within the Auckland region and not to accurately predict the location of different stream class transition points

⁹ Storey, R.; Wadhwa, S. (2009). An Assessment of the Lengths of Permanent, Intermittent and Ephemeral Streams in the Auckland Region. Prepared by NIWA for Auckland Regional Council. Auckland Regional Council Technical Report 2009/028.

84. The EclA has identified a number of priority ecological sites (PES) that identify the moderate, high, very high value or otherwise sensitive locations that the applicant consider require specific attention to avoid, as much as is practicable (EclA; pg. 134; listed in Table 13 of section 3.4.1, and located on Map Series PES, Volume 3 of the AEE). The EclA also considers that, where practicable, further adjustments and refinements to minimise effects on high value areas will occur in the detailed design phase (EclA; pg. 134).
85. These priority sites include, but are not limited to:
- Wetland site HN_W_Hoteo_02 which is subject to a Significant Ecological area (SEA) overlay, an identified Council Biodiversity Focus area (BFA), and assessed as having 'high' ecological value in the application material. HN_W_Hoteo_02 is currently within the designation, however, not directly impacted by the indicative alignment.
 - Wetland site WN_W_Koura_02 is assessed as having 'very high' ecological value in the application material and includes the regionally threatened swamp maire on its margins. WN_W_Koura_02 is currently within the designation, however, not directly impacted by the indicative alignment.
86. The level of uncertainty regarding the actual quantum of residual adverse effects on watercourses and wetlands is exacerbated by terms such as 'where practicable' used throughout the application material, including the proposed conditions, particularly when coupled with measures to avoid adverse effects.
87. The uncertainty of the final alignment, as well as, the use of terms such as 'where practicable' in the proposed conditions undermines the ability to undertake an informed assessment of the actual and potential effects of the proposed activity. This has the potential to lead to unanticipated outcomes. Council require confidence that the actual effects will be in line with that presented in the application material (should consent be granted).
88. It is the opinion of this Technical Assessment that it is appropriate to recommend conditions of consent that provide more certainty on the limits of residual adverse effects; particularly in relation to the moderate, high, very high value, or otherwise sensitive locations, where avoidance of further adverse effects is recommended as part of the application. Imposing such conditions would provide a further level of certainty on the level of adverse effects anticipated as assessed, without limiting the consent holder's ability to apply for a variation to consent if required.
89. It is considered necessary to recommend further conditions to:
- provide further clarity as to the monitoring methods to be used though submitting a monitoring plan for certification.
 - monitor wetland extent and condition in addition to water table level.
 - provide for post construction monitoring and adaptive management measures to provide further offset if required should additional adverse effects be determined.

4.2.4 Certainty of Stream Enhancement Outcomes

90. The EclA states that stream diversions will be created in a manner that will provide at least equivalent function to that of the existing streams if they were restored (to 10 m) (EclA; pg. 157);

additionally the EclA considers that the design of diversions should include riparian vegetation extending 10 m on either side of the channel (EclA; pg. 160).

91. The indicative diversion cross sections provided in the AEE (Appendix F) indicate rock substrate being placed in the channel. This approach is not considered appropriate with respect to achieving like for like enhancement outcomes, especially for the lowland streams which are likely to be naturally soft bottomed. The level of rock armouring shown in the indicative diversion cross sections has the potential to limit the ability for riparian vegetation to establish and provide shading and temperature control to the watercourse; limit habitat heterogeneity; and limit ground water interaction.
92. It is important that confidence is provided that the diversions can achieve at least equivalent function to that of the existing streams, including replicating habitat values and ensuring there is no reduction in temporal and spatial freshwater habitat availability through loss of ground water inputs.
93. The s92 response part 2 states that the final design of the diversions (with cross-sections) will be provided for in a future management plan and subject to conditions of consent.
94. It is considered necessary to recommend amendment to the draft conditions of consent to ensure:
 - the design of the diversions incorporates the requirements for like for like outcomes, ecological functions, habitat values and proposed riparian planting.
 - allow Council to certify the diversion designs.
 - monitoring to ensure the anticipated outcomes of the diversions are achieved.

4.2.5 Wetland Offset

95. Offsetting requires a transparent, explicit and robust measurement and balancing of biodiversity predicted to be lost and gained, resulting in a no net loss (or net gain) of ecological value outcome^{10, 11}. This is noted by the applicant in the s92 response part 2 (Comment on like-for-like and biodiversity offsets).
96. The applicant is proposing to offset the effect of permeant loss of wetlands though the use of predetermined and standardised enhancement ratios (1:3 for 'low' to 'medium' ecological value wetlands and 1:6 'high' to 'very high' value wetlands).
97. Despite the applicant acknowledging that offsetting requires explicit measurements of biodiversity losses and gains (s92 response part 2), no evidence, or transparent, explicit and robust measurements have been provided in the application material to justify the proposed ratios or provide confidence that a no net loss (or net gain) of ecological value is achieved.
98. The application material assesses the impacted wetlands in accordance with the EIANZ impact assessment guidelines¹² and reports on current ecological value ranging from 'low' to 'very high'.

¹⁰ MfE (2014) Guidance on Good Practice Biodiversity Offsetting in New Zealand.

¹¹ Maseyk, F., Usser, G., Kessels, G., Christensen, M., Brown, M. (2018). Biodiversity Offsetting under the Resource Management Act: A guidance document.

¹² Roper-Lindsay, J., Fuller S., Hooson, S., Sanders, M., Ussher, G. (2018). Ecological impact assessment. EIANZ guidelines for

Despite grouping the existing wetland values into four categories, only two offset ratios are offered to respond to the differences in existing value.

99. The proposed ratios do not consider the relative differences in ecological gains at potential offset sites. For example, the difference in ecological gain between enhancing a moderately degraded wetland system compared to enhancing a heavily degraded wetland system.
100. The s92 response part 2 acknowledges that it can be difficult to achieve a substantial increase in ecological value from heavily degraded systems [with ongoing un-mitigated pressures] and similarly difficult to achieve substantive gains from an existing high value system. However, the response does not address the fact that the potential relative differences of ecological gain at the offset sites has not been considered in deriving the proposed ratios.
101. The proposed ratios do not transparently demonstrate how various attributes of ecological value and function are accounted for in determining the ratios and how these values are lost and gained across the proposed trade; for example, presence and condition of a wetland buffer, size, fauna carrying capacity, perimeter:area ratio, and hydrological connectivity.
102. The application material does not provide evidence that the proposed ratios achieve a no net loss of ecological value outcome. This is a key principle of an offset. Without demonstrating adherence to the no net loss principal of offsetting, the enhancement actions are more appropriately considered environmental compensation, and the certainty that no net loss is achieved is not provided.
103. The s92 response part 2 considers that the proposed ratios aim to capture the attributes of offset, e.g., an increase in area of wetland (perimeter: area ratio), carrying capacity (especially with associated predator control), potential for enhancement of current values, importance of the feature (values), and the time lag for replacement from the time of loss. However, this has not been transparently demonstrated.
104. It is considered appropriate to consider the potential values of wetlands in considering the effects. This is supported by the AUP:OP policy framework that seeks the enhancement of degraded freshwater systems (E3.2(2), E3.3(3); B7.2.1(2), B7.3.1(1)) and existing case law¹³, ¹⁴. Furthermore, E3.8.1 (matters for discretion) includes consideration of potential ecological value. The restricted discretionary matters for discretion provide a reasonable initial framework for undertaking an assessment. The s92 response part 2 states that the potential value of the wetlands has been considered in deriving the proposed ratios, however, it has not been transparently demonstrated how this is calculated.
105. In summary, while predetermined and standardised enhancement ratios have been proposed to offset the effects of wetland loss; no transparent, explicit and robust measurements have been provided in the application material to justify the proposed ratios. The relative gains at potential enhancement sites, the potential value of the impacted site, nor a full suite of ecological attributes have not been transparently demonstrated to be considered in determining the ratios.

use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

¹³ Long Bay-Okura Great Park Society Incorporated v North Shore City Council Decision No. 078/2008 – The Court accepted that current poor stream health associated with current poor management of streams is not a valid baseline against which to determine environmental effects.

¹⁴ Hawkes Bay Regional Council v Ngati Kahungunu Iwi Inc NZEnvC 50 & 18/2015) - J Thomson 'having a suboptimal present is not an excuse or failing to strive for an optimal future).

The application material has not demonstrated that a no net loss of ecological value outcome has been achieved.

106. It is therefore considered necessary to recommend conditions of consent that provide for a robust assessment and calculation of appropriate offset ratios following detailed design and prior to the adverse effects occurring.

4.2.6 Time Lag

107. The application material and draft resource consent conditions do not specify when stream and wetland offset works are to be undertaken relative to the timing of the adverse effect occurring. However, the draft designation conditions propose that the habitat rehabilitation in accordance with the Urban and Landscape Design Management Plan(s) is implemented no later than 5 years from the date of the Project becoming operational.
108. The expected construction time frame of the project is 6 – 7 years. Therefore, the time lag between adverse effects on stream and wetlands occurring and the implementation of the offset works may be up to 12 years.
109. The time it takes to generate biodiversity gains is an ecological impact in itself. The longer it takes to achieve an equivalent replacement, the greater the gains generated by the offset need to be to compensate for the time-lag¹⁵.
110. The ECR method includes a 1.5x multiplier that is, in part, to address time lag. This is commonly considered appropriate to apply to situations where the offset occurs within 1 – 2 years following the adverse effect. The application material has not provided evidence as to how potential increased time lag has been considered or accounted for in the stream or wetland offset calculations. The s92 response part 2 notes that at the time of preparation of the EclIA there were no plans available to understand the staging of the project, so it is difficult to anticipate the timing of offset actions.
111. It is therefore considered necessary to recommend conditions of consent to require offset actions to be undertaken each year proportionate with the adverse effects occurring in the previous year. This is recommended to be managed through Annual Offset Plans being submitted to Council for certification.

4.2.7 Kourawhero Wetland Complex Monitoring

112. The EclIA recommends minimising water table changes to wetlands WN_W_Koura_02 to WN_W_Koura_05 (Kourawhero Wetland Complex). The proposed draft conditions include a condition to undertake pre-construction monitoring of the water table levels for these sites and to construct bridges, structures, culverts and embankments to cross the Kourawhero Stream to minimise change to the Kourawhero Wetland Complex and to maintain the pre-construction water table level.
113. The draft condition proposes 12 months of monitoring prior to starting Project Works. It is considered that this does not enable sufficient baseline data to assess the extent to which

¹⁵ Maseyk, F., Ussher, G., Kessels, G., Christensen, M., & Brown, M. (2018) The Biodiversity Offsetting under the Resource Management Act Guidance Document.

adverse effects have been minimised or avoided and to allow for any additional adverse effects to be quantified and addressed through further offsetting. A minimum of three years monitoring prior to Project Works is recommended. It is also recommended that monitoring occurs for at least 3 years following completion of the physical works and any un-avoided adverse effects to the Kourawhero Wetland Complex addressed through further wetland offsets.

114. In addition to monitoring water levels, it is considered appropriate to monitor wetland extent and ecological condition as a means to better understand and address any adverse effects.

4.2.8 Protection and Ongoing Maintenance of Offset Sites

115. The ecological offset should be managed to secure outcomes, at least as long as the impact duration, and preferably in perpetuity. The EclA recommends that all [offset] areas are protected legally as appropriate (pg. 146). Conditions of consent are recommended to ensure this outcome is achieved.
116. Additionally, the EclA considers that the [offset] sites should be subject to pest and weed management until they are well-established. It is considered by this Technical Assessment that pest animal and plant control should continue at least as long as the impact duration, and preferably in perpetuity.
117. Therefore, it is recommended that the protections mechanisms ensure:
- native flora and fauna within the covenant boundary is protected.
 - ongoing pest plant and pest animal control.
 - stock are excluded.

4.2.9 Site-Specific Enhancement Plans

118. The application lacks site-specific details regarding the enhancement actions including weed control and planting proposed for the stream and wetland offset measures.
119. It is considered that when riparian weed control is not sufficiently considered or inappropriately implemented it can cause adverse effects to stream ecological functional values (for example, loss of shading or increase in stream bank erosion).
120. Furthermore, any proposed riparian planting should consider the existing stream bank erosion susceptibility of the stream and the existing levels of downcutting and bank angles. In some situations, riparian planting alone may not be sufficient to prevent further stream bank erosion from occurring and further erosion may lead to failure of the enhancement planting.
121. In order to ensure any stream riparian or wetland enhancement planting successfully establishes, and provides confidence in the purported ecological outcomes, it is considered necessary to undertake pest plant and animal control for a minimum of five years or until canopy closure has been achieved. It is also considered necessary to provide replacement planting for failed or dead plants during this period.
122. For these reasons it is considered necessary that any proposed enhancement actions that form the stream or wetland offsetting are submitted to Council in the form of site-specific management plans prior to implementation for certification, and then implemented in accordance with those plans.
123. It is recommended that the conditions of consent:

- ensure proposed enhancement actions are certified by Council prior to implementation.
- provide clarity around the matters to be included in the site-specific plans, including the risk of failure due to stream bank erosion.
- provide further clarity for the matters that Council need to certify the site-specific plans against.

124. It is noted that aspects of these recommendations are proposed in the draft designation conditions in relation to the Ecological Management Plan; however, these aspects are also required in the resource consent conditions to manage the adverse effects of watercourse diversion and wetland reclamation.

4.2.10 Monitoring of Ecological Outcomes

125. To achieve or sustain gains long-term requires a well-designed monitoring and reporting programme and an adaptive management approach to adjust maintenance and management actions as necessary¹⁶.

126. It is considered necessary to recommend conditions to ensure a robust monitoring and adaptive management framework is implemented to ensure the proposed offsetting is implemented and establishes. Five years of monitoring and annual reporting to Council is recommended in line with the maintenance period.

127. It is noted that aspects of these recommendations are proposed in the draft designation conditions in relation to the Ecological Management Plan; however, these aspects are also required in the resource consent conditions to manage the adverse effects of watercourse diversion and wetland reclamation.

4.2.11 Summary

128. This Technical Assessment finds a level of agreement with application material, however, matters of technical concern have been noted, including outstanding issues that are required to be resolved for this Technical Assessment to support the granting of the consent.

129. These technical concerns that are considered to require resolving include:

- Uncertainty regarding the adverse effects associated with the soil disposal sites as these effects have not been considered in the EclA.
- Setting limits to adverse effects.
- Providing certainty of stream enhancement outcomes.
- Providing for a transparent and quantitative assessment to determine wetland offset requirements.
- Limiting the time lag between adverse effects and implementing offset enhancement actions.
- Ensuring meaningful monitoring of the Kourawhero Wetland Complex.
- Providing for protection and ongoing maintenance of offset sites.
- Providing for site-specific enhancement plans.

¹⁶ Maseyk, F., Usser, G., Kessels, G., Christensen, M., Brown, M. (2018). Biodiversity Offsetting under the Resource Management Act: A guidance document

- Providing for monitoring of ecological outcomes.
130. Recommendations to the conditions of consent have been made to address these technical concerns. However there remains uncertainty regarding the level of effects associated with the indicative soil disposal sites.

5.0 SUBMISSIONS

131. A number of submissions have been received that related to matters covered by this Technical Assessment. The following submissions on the resource consent application have been specifically reviewed:
- Shane Morgan (WSL) (ID 10656): neutral regarding the application in whole or in part.
 - Malcolm Lea (ID 10675): neutral regarding the application in whole or in part.
 - Malcolm Lea (ID 10663): supports the application in whole or in part.
 - Tertia de Vaile Wildy (ID 10672): opposes the application in whole or in part.
 - Dianne Civil (ID 10673): opposes the application in whole or in part.
 - Bruce and Joy Drower (ID 10638): supports the application in whole or in part.
 - Angela and Geoffrey Still (ID10667): opposes the application in whole or in part.
 - William Jennings for Royal Forest and Bird Protection Society of New Zealand (ID 1): opposes the application in whole or in part.
 - Graeme Silver for Department of Conservation (ID 5): opposes the application in whole or in part.
 - David Mason and Dianne McCallum (ID 10641): opposes the application in whole or in part.
 - Gena Moses-Te Kani (ID 10671): supports the application in whole or in part.
132. The following submission on the Notice of Requirement (NOR) have also been reviewed as they included aspects relating to freshwater ecology and matters Addressed in this Technical Assessment
- Amanda and Erdem Oguz (ID 08): Oppose the NOR
 - Friends of Streamlands (ID 09): Oppose the NOR
 - Wendy Patricia Court (ID 13): Oppose the NOR
 - Dando Family Trust (ID 23): Oppose the NOR
133. The submissions relating to aspects of this Technical Assessment can be predominantly summarised into the following themes:
- Noting the impacts on the stream.
 - Noting the impacts on wetlands.
 - Inadequacy of proposed mitigation and offset and compensation package.
 - Proposed lapse period and implications on ecological assessments.
 - Inadequate conditions of consent and reliance on yet to be prepared management plans.
 - Requirement for Protection and ongoing maintenance of offset sites.

134. Comments and responses to particular submissions points are made in Appendix 1, where relevant.

6.0 STATUTORY CONSIDERATIONS

6.1 Streamworks

6.1.1 Objectives and Policies of the Auckland Unitary Plan: Operative in Part (AUP:OP)

135. The relevant streamworks objectives and policies are found in Chapter E3 of the AUP:OP; Objectives 1, 2, 3, 4, 5, 6, and Policies 1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 13, 15. These objectives and policies seek to ensure that streamworks are undertaken in a manner that protects people, the environment, and that adverse environmental impacts are avoided and mitigated and significant residual impacts are offset accordingly. Note provisions related to streams are also located in chapter E1. The provisions relating to overlays relevant to chapter E3 are located in chapters D4 – D9.

6.1.2 Other Statutory Documents

136. The following statutory documents are considered relevant to the planner's assessment of the application:

- **AUP:OP Regional Policy Statement**

137. Chapter B7, Natural Resources of the AUP: OP Regional Policy Statement is considered relevant as the objectives and policies in section B7.3 seek to ensure the enhancement of degraded freshwater systems, freshwater system loss is minimised and that any adverse effects are avoided, remedied or mitigated. Section 7.4 seeks to maintain water quality in freshwater bodies and coastal waters which have good water quality, and to enhance the water quality in degraded systems.

- **National Policy Statement: Freshwater Management 2014 (amended 2017) (NPS:FM)¹⁷**

138. As the application relates to works within and around streams, the NPS Freshwater Management is considered relevant to this application. Objectives of the NPS: Freshwater Management centre on safeguarding the life supporting capacity, ecosystem processes and indigenous species of water bodies in terms of water quality and quantity.

- **New Zealand Coastal Policy Statement 2010 (NZCPS)**

139. As the application relates to works and discharges to a stream which ultimately flows into the marine environment, the NZCPS is considered relevant to this application. Objectives of the NZCPS centre on safeguarding the integrity, form, functioning and resilience of the coastal environment along with sustaining its ecosystems.

¹⁷ I have undertaken a brief review of the NPS – Freshwater Management and NES - Freshwater published on 3 August 2020, which become effective (in part) on 3 September 2020. The wetland and stream provisions do not alter my comments within this Technical Assessment at the time of writing. However, updates or amendments may be required later upon closer review and direction from Council.

- **Hauraki Gulf Marine Park Act (HGMPA) 2000**

140. As the ultimate receiving environment of the proposed activity is the Hauraki Gulf, the HGMPA is considered relevant to this application. For the coastal environment of the Hauraki Gulf, sections 7 and 8 of the HGMPA must be treated as the New Zealand Coastal Policy Statement. Section 7 seeks to recognise the national significance of the Hauraki Gulf, its islands and catchments. Section 8 outlines the management objectives of the Hauraki Gulf, intended to protect, maintain and where possible enhance the life-supporting capacity of the Hauraki Gulf along with enhancing its natural, historic and physical resources

7.0 RECOMMENDATION AND CONDITIONS

7.1 Adequacy of Information

141. The above assessment is based on the information submitted as part of the application. Aspects of the application provide insufficient information to understand the scale of effect and the appropriateness of the proposed 'effects management package', including:
- A lack of transparent quantitative assessment to justify the proposed wetland offset ratios.
 - o It is possible to address this concern through the recommended condition requiring the quantum of offset to be calculated using best practice methods.
 - The actual or potential adverse effects watercourses associated with the indicative soil disposal sites has not been assessed and/or considered in assessing the freshwater ecological effects of the proposed activity or determining the proposed 'effects management package'.
 - Uncertainty as to whether the proposed 'effects management package' can be implemented within the proposed designation, particularly:
 - o As the effects associated with the soil disposal areas were excluded from the ecological assessment and are likely to require a degree of offsetting.
 - o As the reported extent of watercourses available for offset includes watercourses within the indicative soil disposal sites.
 - o If the Dome Valley Forest Section has not been subject to forest harvest at the time of construction this will impact the quantum requirements and offset site location availability

7.2 Recommendation

142. Should consent be granted on the balance of outcomes, recommended amendments and additions to the proposed draft conditions of consent have been suggested to ensure that the mitigation and offset offered by the applicant is implemented in full and as anticipated, while allowing for Council certification of outcomes where uncertainty remains due to the nature of the indicative alignment, application material, and proposed construction time frames.

7.3 Conditions

143. The application material provides proposed conditions of consent. Should consent be granted on the balance of outcomes, recommended amendments and additions to the proposed draft conditions of consent have been suggested below. The recommendations are made to:
- Provide consistency and corrections to errors.

- Ensure that the avoidance, mitigation and offset offered by the applicant is implemented in full, as anticipated, and following best practice.
 - Provide for outcomes recommended in this Technical Assessment.
 - Enable Council to certify management plans and outcomes were appropriate.
 - Provide clarity and certainty on measures against which Council can certify and monitor against.
144. These suggested amendments are summarised below with proposed additional text shown as underlined and proposed deletions shown ~~struck through~~.
145. Numbering from the draft conditions supplied as part of the application material has been used.

Table 2: Management Plan Table

Management Plan	Decision Pathway	When submit to	Response time from Team Leader Compliance Monitoring NW1	Duration for implementation
<u>Stream Ecological Effects Management Plan (SEEMP) Compensation</u>	<u>Certified by Council Team Leader Compliance Monitoring NW1</u>	<u>Prior to start of Construction Works Project becoming operational</u>	<u>Within 20 working days</u>	<u>N/A</u>
<u>Wetland Ecological Effects Management Plan (WEEMP)</u>	<u>Certified by Council</u>	<u>Prior to start of Construction Works</u>		
<u>The Wetland Monitoring Plan</u>	<u>Certified by Council</u>	<u>Prior to Wetland monitoring at least 3 years prior to Project Works</u>		
<u>Native Freshwater Fish Capture and Relocation Plan (NFFCRP)</u>	<u>Certified by Council</u>	<u>Prior to start of Streamworks</u>		
<u>Annual Mitigation and Offset Plan (AMOP)</u>	<u>Certified by Council</u>	<u>30 June annually</u>		

Works in a Watercourses and Wetlands and freshwater ecology

Crossing watercourses - Location of bridge structures

52. The Consent Holder shall design and construct the Project to include bridge structures with no piers in the Bed of the following Watercourses (as identified on Maps 14 – 16):
- a. Mahurangi River (Left Branch);
 - b. Hōteo River;
 - c. Waitaraire Stream; and
 - d. Maeneene Stream.

Crossing of the Kourawhero Stream and Kourawhero Wetland Complex

- 53 Prior to commencing the Wetland monitoring the Consent Holder shall provide to Council for certification a Wetland Monitoring Plan. The Wetland Monitoring Plan shall provide at a minimum the following to enable a suitable level of detail with which to monitor the effects of the Project on the Kourawhero Wetland Complex:

- a. The methods for monitoring water table levels;
- b. The number and locations of water level sampling sites;
- c. The methods for delineating the Wetland extents in accordance with best practice;
- d. The method for assessing Wetland condition in accordance with best practice;
and
- e. The timing and frequency of monitoring events.

The Consent Holder shall monitor over a ~~12-month~~ three (3) year period prior to starting Project Works, Kourawhero Wetland Complex (as identified in Map 17) to confirm pre-construction water table levels, ecological condition and Wetland extent in accordance with the certified Wetland Monitoring Plan. The results of the monitoring shall be provided to Council ~~the Team Leader – Compliance Monitoring NW1~~ for information.

- 54 The Consent Holder shall design and construct bridges, structures, culverts and embankments to cross the Kourawhero Stream to minimise change to the Kourawhero Wetland Complex and to maintain the pre-construction water table level, Wetland extent, and Wetland condition, as far as practicable, which shall include:
- a. A bridge over the Kourawhero Stream with no piers in the Bed in the section of stream identified on Map 17 as “Section of Kourawhero Stream to be bridged”;
and
 - b. Minimising intrusion of diversion channels into or through the Kourawhero Wetland Complex.

X.1 The Consent Holder shall undertake annual monitoring in accordance with the Wetland Monitoring Plan until 3 years following completion of the Project Works. Should the monitoring indicate a loss in Wetland extent or condition that has not been considered in the preparation of the Wetland Ecological Effects Management Plan required by condition X.3, the Consent Holder shall provide further mitigation and/or offset to manage the additional adverse effects in accordance with conditions X.3.

Watercourse design requirements

- 56 The Consent Holder shall design and construct all Watercourse stream diversions ~~that are contributing towards mitigation and/or offset of effects to have natural Watercourse stream forms and riparian planting. where the diverted streams are permanent and supporting fish habitats.~~ The Watercourse stream diversions shall be designed by Suitably Qualified and Experienced Persons. The diversions shall be designed to achieve the outcomes anticipated in the application material including:
- a. at least equivalent ecological function and habitat value to that of the potential values of the Watercourse being diverted, demonstrated using the Steam Ecological Valuation methods (Auckland Council Technical Report 2016/023 and Technical Report 2011/009);
 - b. being like for like in regard to Watercourse hydrological conditions and substrate;
and
 - c. including riparian vegetation extending 10 m on either side of the channel.

Advice Note: condition 56 does not apply to cut off drains and vertically lifted channels that do not contribute towards the mitigation or offset quantum.

Culvert design – fish passage and migrating fish

- 59 The Consent Holder shall provide fish passage in accordance with best practice in all temporary and permanent culverts and Stormwater Management Wetlands unless deemed unnecessary or impracticable by a Suitably Qualified and Experienced Freshwater Ecologist.
- 60 Where fish passage is deemed unnecessary or impracticable, appropriate data and rationale for the decision shall be provided to Council for certification. ~~for certification by Council the Team Leader – Compliance Monitoring NW1.~~

Advise Note: Certification of this condition does not absolve the Consent Holder from any obligations under any other Statute or Act.

Design certification – permanent structures in Watercourses and Wetlands, and diversions

- 61 The Consent Holder shall provide drawings of the detailed design of permanent bridges, culverts to be constructed in or over Watercourses and Wetlands, and Watercourse stream diversions to be constructed in or over Watercourses and Wetlands, to Council the Team Leader – Compliance Monitoring NW1 for certification at least 30 Days prior to the start of construction of the relevant structures. The drawings shall be accompanied by a written report prepared by a Suitably Qualified and Experienced ~~Expert~~ Persons setting out how the design requirements of conditions 54 and 56 to 61 have been met and the rationale for any departures from those requirements. The Consent Holder shall construct the Project in general accordance with the certified design.

Freshwater ecology: Pre-construction monitoring

- 70 The Consent Holder shall survey the Representative Watercourses or other watercourse determined by condition ~~71-73 for one summer and one winter period~~ prior to commencement of Construction Works prior to Project Works commencing. The survey shall be undertaken and recorded by a Suitably Qualified and Experienced Person:
- a. in accordance with the requirements of Stream Ecological Valuation: Application to Intermittent Streams (Auckland Council Technical Report 2016/023) or Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report 2011/009), depending on the Watercourse stream classification; ~~and~~
 - b. ~~to confirm representative pre-construction environmental conditions in the Project area, represented by:~~
 - i. ~~sediment quality (concentrations of copper, lead, zinc, TOC and HMW- PAHs in both total sediment and the <63µm fraction, plus grain size analysis of the total sediment sample), and sediment depth; and~~
 - ii. ~~water quality, limited to TSS, pH, turbidity, nitrogen and phosphorous.~~
- 71 In the event that a Suitably Qualified and Experienced Person considers a Representative Watercourse is not representative of general Watercourse stream characteristics within the Project area, justification and an alternative Representative Watercourse shall be provided to Council for certification. The Consent Holder shall survey such other Watercourse recommended by a Suitably Qualified and Experienced Person, and certified by Council, using the same process in condition ~~70. 76.~~

- 72 The Consent Holder shall provide to the Council the results of the pre-construction freshwater monitoring within 30 working days of the final pre-construction monitoring being undertaken, ~~including the rationale for where an alternative stream has been surveyed under condition 73.~~

Freshwater ecology: Recording of ~~streams~~ Watercourses affected by the Project

- 73 The Consent Holder shall engage a Suitably Qualified and Experienced Person to identify and record all ~~Watercourses and Wetlands~~ that will be affected by Project Works, prior to the start of Project Works, including:
- a. Location;
 - b. Length;
 - c. Width
 - d. Intermittent or permanent status; and
 - e. Which of the Representative Watercourses surveyed under condition 70 and 71 ~~72 and 73~~ the Watercourse ~~or Wetland~~ is most similar to, with explanation and justification.

This information shall be provided to Council for certification

Freshwater ecology: Replacement works for loss of ~~stream~~ Watercourse ecological value and function

- 74 The Consent Holder shall mitigate and/or offset for streamworks or loss of ~~Watercourse stream~~ ecological value and function in accordance with the requirements of the following technical reports prior to completion of Project Works:
- a. Stream Ecological Valuation: application to intermittent streams (Auckland Council Technical Report 2016/023); and
 - b. Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report 2011/009).
- 75 The quantum of ~~Watercourse mitigate mitigation and/or offset~~ and its design and location shall be set out in a ~~Streamworks Ecological Compensation Plan~~ Effects Management Plan (SECP SEEMP). The ~~SECP SEEMP~~ shall:
- a. Confirm the ~~Watercourses and Wetlands in condition 75 that have been~~ will be directly affected by the Project;
 - b. Outline the method to extrapolate the SEV calculations for the Representative ~~Watercourses Streams~~ to apply to all ~~Watercourses and Wetlands~~ affected by Project works;
 - c. Calculate the quantum and location of mitigation and/or offset provided in accordance with SEV requirements as set out in condition 74 ~~76~~;
 - d. Demonstrate that the proposed mitigation and/or offset is like for like in regard to Watercourse hydrology and substrate;
 - e. Integrate the mitigation and/or offset planting with the restoration planting and habitat rehabilitation required in the Ecological Management Plan required under Designation Condition 55 where practicable; and
 - f. Provide site specific enhancement plans for the proposed mitigation and/or offset sites that:

- i. Details how the anticipated outcomes used in the SEV calculations will be achieved;
- ii. Assesses the risk of stream bank erosion and the likely successful establishment of proposed riparian planting;
- iii. Details the planting to be carried out, including a list of species, numbers to be planted, their common and botanical names, method of planting, planting locations and densities;
- iv. Details the timing of works and techniques of weed and plant management measures for a period of no less than 5 years or until canopy closure is achieved;
- v. Details the works and techniques animal pest control for a period of no less than 5 years or until canopy closure is achieved;
- vi. Details of monitoring methods and frequency, including at a minimum annual reporting to Council for a period of no less than 5 years or until canopy closure is achieved; and
- vii. Is in accordance with AUP:OP Appendix 16: Guideline for native revegetation plantings.

The SEEMP shall be provided to Council for certification prior to the start of any Construction Works.

Advice Note: Reference to offsetting stream loss through rehabilitated Wetland areas. This approach is not consistent with the AUP:OP policy E3.3(4) and was not anticipated to form part of the offsetting requirements at the time of granting consent. Such an approach would need to clearly demonstrate adherence to the 'effects management hierarchy' and preferably demonstrate a 'trade-up' offset outcome.

Freshwater ecology: Recording of Wetlands affected by the Project

X.2 The Consent Holder shall engage a Suitably Qualified and Experienced Person to identify and record all Wetland that will be affected by Project Works, prior to the start of Project Works, including:

- a. Location of Wetlands affected by Project Works;
- b. Total area of Wetland and area impacted by the Project Works, delineated using best practice;
- c. Wetland type;
- d. Ecological value.

Freshwater ecology: Replacement works for loss of Wetland ecological value and function

X.3 The quantum of Wetland mitigation and/or offset and its design and location shall be set out in a Wetland Ecological Effects Management Plan (WEEMP). The WEEMP shall:

- a. Confirm the Wetlands that will be directly affected by the Project Works;
- b. Calculate the quantum and location of offset to be provided using best practice transparent and quantified offset accounting methods, ensuring that:
 - i. The potential value of the impacted Wetland is accounted for;
 - ii. The relative ecological gain at the proposed offset site is accounted for;
 - iii. An appropriate suite of ecological attributes are included in the offset accounting method; and

- iv. Time lag is accounted for.
- c. Demonstrate that the proposed offset is like for like in regard to Wetland type and hydrology;
- d. Integrate the offset planting with the restoration planting and habitat rehabilitation required in the Ecological Management Plan required under Designation Condition 55 where practicable; and
- e. Provide site specific enhancement plans for the proposed offset sites that:
 - i. Details how the anticipated outcomes used in the offset calculations will be achieved;
 - ii. Details the planting to be carried out, including a list of species, numbers to be planted, their common and botanical names, method of planting, planting locations and densities;
 - iii. Details the timing of works and techniques of weed and plant management measures for a period of no less than 5 years or until canopy closure is achieved;
 - iv. Details the works and techniques animal pest control for a period of no less than 5 years or until canopy closure is achieved;
 - v. Details of monitoring methods and frequency, including at a minimum annual reporting to Council for a period of no less than 5 years or until canopy closure is achieved; and
 - vi. Is in accordance with AUP:OP Appendix 16: Guideline for native revegetation plantings.

The WEEMP shall be provided to Council for certification prior to the start of any Construction Works.

Freshwater ecology: Mitigation and offset implementation

X.4 All mitigation and/or offset enhancement works are to be carried out in accordance with the certified SEEMP and WEEMP required by conditions 75 and X.3.

Prior to the 30 June each year following the start of Project Works the Consent Holder shall submit to Council for certification an Annual Mitigation and Offset Plan (AMOP). The AMOP shall:

- a. Detail the extent of Watercourse and Wetland that have been directly affected by the Project Works over the previous 12 months; and
- b. In general accordance with the certified SEEMP and WEEMP required by conditions 75 and X.3, detail the quantum of mitigation and offset works required to address the effects detailed in the AMOP

The Consent Holder shall undertake the works outlined in each AMOP within two (2) years of the AMOP being certified by Council.

Written confirmation shall be provided to Council within 30 days of the works outlined in each AMOP being completed confirming that all works have been completed in accordance SEEMP and WEEMP required by conditions 75 and X.3.

Freshwater ecology: Protection of Watercourse and Wetland offset sites

X.5 Prior to the completion of Project Works the consent holder shall provide to Council for certification the details of the protection mechanisms that are to apply to all offset sites

outlined in the SEEMP and WEEMP required by conditions 75 and X.3. The protection mechanisms must ensure:

- a. native vegetation is protected in perpetuity;
- b. ongoing pest plant and pest animal control is undertaken; and
- c. stock is excluded from the sites in perpetuity

Freshwater ecology: Maintenance of Watercourse and Wetland offset sites

X.6 Offset enhancement works outlined in the certified SEEMP and WEEMP required by conditions 75 and X.3 shall be maintained in accordance with the SEEMP and WEEMP for a period of no less than 5 years or until canopy closure has been achieved, whichever is longer.

Prior to the completion of the maintenance period Council must provide certification that:

- a. Canopy closure has been achieved;
- b. No more than 10% loss in plant numbers has occurred;
- c. Weed control has been carried out to a level where no mature fruiting or flowering weed species are present within the planting areas and no weed species that will impact on the growth rates of the planted trees and/or the potential for native regeneration are to be present within the planting area; and
- d. All works have been undertaken in accordance with the certified SEEMP and WEEMP required by conditions 75 and X.3.

Native fish capture and release

76 ~~The Consent Holder shall engage a Suitably Qualified and Experienced Person to conduct native fish habitat and presence surveys within the Designation prior to the start of Project Works in streams that may be impacted by Project Works. Prior to any Wetland or streamworks activity commencing, the consent holder shall submit a Native Freshwater Fish Capture and Relocation Plan (NFFCRP), produced by a suitably qualified and experienced freshwater ecologist, to Council for certification. This plan shall detail how native fish will be salvaged prior to works commencing and shall include but not be limited to:~~

- a. Methodologies and timing to capture fish, including kakahi and koura, within the impacted Watercourse and Wetland habitats, or justification there is no habitat for native fish present at the time of earthworks;
- b. Fishing effort;
- c. Details of the relocation site;
- d. Fish exclusion fencing to prevent fish movement to the Watercourse reach where works will occur;
- e. Placement of appropriate fish screens on the inlets of any pumps used;
- f. Methods to manage streamworks during September to November inclusive of any year, to minimise impacts on fish during the fish spawning season;
- g. Storage and transport measures including prevention of predation and death during capture; and
- h. Euthanasia methods for diseased or pest species.

- 77 ~~In the event that the surveys confirm native fish habitat and presence the~~ The Requiring Authoring Consent Holder shall:
- a. Engage a Suitably Qualified and Experienced Person to implement the NFFCRP required by condition 76. ~~confirm and implement best practice methods to:~~
 - i. ~~manage streamworks during September to November inclusive of any year, to minimise impacts on fish during the fish spawning season; and~~
 - ii. ~~capture and relocate native fish species prior to commencement of Project Works.~~
 - b. Provide a report on the surveys undertaken and the results to the Council within ten (10) working days. ~~Team Leader – Compliance Monitoring NW1.~~

Freshwater ecology: Limits to adverse effects

X.7 No more than xxx ha of high or very high value Wetland, shall be reclaimed by the Project Works. No reclamation of Wetland sites WN_W_Koura_02 or HN_W_Hoteo_02 shall occur.

Advice Note: 'High' and 'Very high' are used here in a manner consistent with their meaning as set out in Roper-Lindsay, J., Fuller S., Hooson, S., Sanders, M., Ussher, G. (2018). Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition

Ensure machinery does not discharge/spill hazardous substances during earthworks

X.8 No machinery shall enter the wetted cross section of the bed of the Watercourse at any time. All machinery associated with the streamworks activity shall be operated (including maintenance, lubrication and refuelling) in a way, which ensures no hazardous substances such as fuel, oil or similar contaminants are discharged.

In the event that any discharge occurs, works shall cease immediately, and the discharge shall be mitigated and/or rectified to the satisfaction of Council.

Advice Note: Refuelling, lubrication and maintenance activities associated with any machinery should be carried out away from any water body with appropriate methods in place so if any spillage does occur that it will be contained and does not enter the water body.

No reclamation within soil disposal sites

X.9 Aside from those streams and wetlands which will be affected by the proposed motorway embankment and other structures, no reclamation of any body of freshwater associated with any soil disposal sites shall occur.

Where watercourse diversions for soil disposal sites are required, the design certification for diversions required by condition x.61 shall demonstrate how reclamation of streams and wetlands is avoided.

8.0 REVIEW

Memo prepared by:

Mark Lowe




Streamworks Consultant to the Earth, Streams and Trees team, Specialist Unit, Resource Consents

Date: 18 August 2020

Technical memo reviewed and approved for release by:

David Hampson



Team Leader, Earth, Streams and Trees
Specialist Unit, Resource Consents

Date: 18 August 2020



Appendix 1: Relevant Submissions and Comments

Submission Point	Technical Assessment Response (with consideration of matters addressed by this Technical Assessment)
Resource Consent	
Shane Morgan for Watercare Services Limited (ID 10656) Neutral regarding the application in whole or in part	
(f) Adverse implications for Watercare’s planned revegetation and riparian planting in the Hōteao River and its tributaries.	Neutral on submission: It is not clear from the submission the nature or location of the planned riparian planting
48. Watercare’s Wellford WWTP discharges water into a tributary of the Hōteao River. As part of Watercare’s most recent resource consent for the plant, it has undertaken to provide riparian planting for nutrient attenuation and to enhance the ecological value of the Hōteao River. Watercare is also considering options to implement positive offset mitigation planting in the wider catchment to further attenuate discharges from the WWTO and improve overall water quality.	Neutral on submission: Based on the indicative alignment it is likely that there will be a level of culverting and/or stream length loss on the tributary in this location.
49. The new SH1 indicative alignment passes over part of this unnamed tributary of the Hōteao River. The Application material shows that the Applicant intends to undertake some riparian planting in the area. 50. Watercare is keen to understand any impacts of the Application on the tributary. If this project requires the removal of existing wetlands, changes the inflows into the tributary, discharges additional contaminants or reduces the length of the tributary prior to it entering the Hōteao, this may impact the water quality and/or quantity of the	

<p>Hōteu River which may have implications on Watercare's activities.</p> <p>51. Watercare sees an opportunity to collaborate with the Applicant and other interested parties including local iwi and/or hapu and local businesses to revegetate the area. As a minimum, the organisations should be looking to ensure any wetlands on this tributary are replaced and the length of the tributary is not significantly shortened.</p> <p>52. Watercare seeks provision for these concerns in any conditions.</p>	
<p>Malcolm Lea (ID10663) Supports the application in whole or in part</p>	
<p>The landscape and ecological planting on 199 shepherd road and adjacent specific conditions over the landscape and ecological planting</p>	<p>Neutral on submission:</p> <p>It is not clear from the submission the nature or location of the ecological planting.</p> <p>Assuming is it in the location of the head of the tributary, the watercourse is in designation but not indicative alignment.</p> <p>The application and recommended conditions of consent outline a suitable process to offset any adverse effects on this watercourse should that be the case.</p>
<p>Tertia de Vaile Wildy (ID10672) Opposes the application in whole or in part</p>	
<p>The plan for the proposed interchange is very expansive and will have an adverse effect on areas of native habitat that has a number of mature native trees -including large Totara, wet-lands, and parts of the Mahurangi River (a branch of which has been</p>	<p>Neutral on submission:</p> <p>It is considered that the application has taken an informed assessment in proposing the indicative alignment which has sought to minimise impacts on the Mahurangi River</p>

<p>omitted from the plans). This will have a significant negative effect on vegetation and wildlife, particularly a variety of native birds who are living there happily at the moment</p>	<p>and wetlands through the use of bridges and avoidance of most high value wetland sites.</p> <p>It is not clear which branch has of the Mahurangi River has been omitted from which plan. It is considered that the Ecological Assessment Freshwater Site Maps (ES-050 – ES-056 sufficiently outline the actual and potential watercourses along the indicative alignment.</p> <p>Proposed conditions require all watercourses to be impacted following detailed design to be identified and surveyed.</p>
<p>I would like the council to look carefully at the proposal and request the plans be amended to have less negative effects in all areas mentioned above</p>	<p>As above</p>
<p>Dianne Civil (ID 10673) Opposes the application in whole or in part</p>	
<p>The ecological effects of the Proposal on the Mahurangi River (Left Branch) and its margins including areas of mature remnant vegetation and areas of significant conservation and ecological value.</p> <p>The quality of the information and assessment regarding the impacts and effects on the Mahurangi River</p> <p>The above ecological effects have not been adequately avoided, remedied or mitigated and there are no environmental benefits to offset or compensate the effects.</p> <p>The use of three bridges is not sufficient, nor the level of riparian planting and habitat creation referred to on page 227 or the “enhancements” on page 376.</p>	<p>Neutral on submission:</p> <p>A freshwater survey site is located on the Mahurangi Left Branch (WN_F_Mahu_1). While no SEV was undertaken at this site it was assessed as having high ecological value.</p> <p>It is considered that the application has taken an informed assessment in proposing the indicative alignment which has sought to minimise impacts on the Mahurangi River and wetlands through the use of bridges and avoidance of most high value wetland sites.</p>

<p>Bruce and Joy Drower (ID 10638) Supports the application in whole or in part</p>	
<p>There is a dam and natural spring in the designation area in the North East corner of the site as demonstrated in figure 2. This is an important asset which needs to be protected as this aquifer/spring provides year round water supply (including continuing to run throughout the 2020 summer drought). We would like to see this retained and protected for future use due to its ecological value for the locality</p>	<p>Neutral on submission: Currently the spring and watercourse is in designation but not indicative alignment. The application and recommended conditions of consent outline a suitable process to offset any adverse effects on this watercourse should that be the case.</p>
<p>Angela and Geoffrey Still (ID10667) Opposes the application in whole or in part</p>	
<p>The Proposal will have major negative environmental impacts on: The Mahaurangi River environment The consent application does not recognise the significant level of these negative impacts. It leaves the actual design to a later decided organisation. The conditions proposed do not go far enough to protect the environment and impacted people.</p>	<p>Neutral on submission: It is considered that the application has taken an informed assessment in proposing the indicative alignment which has sought to minimise impacts on streams and wetlands. The application and recommended conditions of consent outline a suitable process to offset any adverse effects on this watercourse should that be the case.</p>
<p>William Jennings for Royal Forest and Bird Protection Society of New Zealand (ID 1) Opposes the application in whole or in part</p>	

<p>2.2. The project does not protect these [watercourse and wetland] values, nor do the applications set out an adequate assessment of effects upon which measures to avoid, remedy and mitigate can be applied and any residual effects determined for further consideration of offsetting or compensation measures (i.e., the applications rely heavily on yet to be developed management plans).</p>	<p>Neutral on submission:</p> <p>It is recognised that the application relies on to be developed management plans and a representative assessment of the current ecological values.</p> <p>It is considered that the application has taken an informed assessment in proposing the indicative alignment which has sought to minimise impacts on streams and wetlands.</p> <p>The application and recommended conditions of consent outline a suitable process to mitigate and offset any adverse effects on this watercourse should that be the case.</p> <p>Further recommended conditions have been provided to set limits to the extent of adverse effects on wetlands.</p>
<p>3.5. Forest & Bird is supportive of the proposition to provide fish passage through all culverts. But is concerned by the use of the term that have viable upstream habitat. While in some instances the upstream habitat may not be viable at the moment, the habitat upstream could regenerate or be more agreeable to species in the future, and its potential accessibility to fish should not be cut off just because it is somewhat inconvenient for construction or "not considered necessary".</p>	<p>Support submission:</p> <p>Recommended amendments to proposed draft conditions are made to enable certification of situations where the Consent Holder deems fish passage unnecessary.</p> <p>This is further managed through the Freshwater Fisheries Act and required DOC permissions.</p>
<p>7.1. The lapsing date for the resource consents is too long. Forest & Bird is concerned that the existing environment could change dramatically and more, possibly less, indigenous biodiversity could be present. Forest & Bird considers that the lapse date should be much less to reflect the current environment</p>	<p>Neutral on submission:</p> <p>Lapse date addressed in Technical Assessment as a Matter to Note.</p>
<p>7.4 Forest & Bird considers that the management plan approach taken is particularly fraught. Specific conditions need to be included which management plans can</p>	<p>Support submission:</p>

<p>implement and be measures against for compliance purposes. Conditions are needed to set out limits and specific measures to give confidence that mitigation measures will be implemented by the applicant.</p>	<p>Recommendations have been made to the proposed conditions to provide council the ability to certify management plans along with providing more clarity on the matters to be included in management plans.</p>
<p>7.8. The ongoing ecological monitoring proposed by the applicant are not adequate to ensure that the benefits of the offset and compensation package will be achieved and sustained</p>	<p>Neutral on submission: Recommendations have been made to the proposed conditions to ensure monitoring and annual reporting of offset enhancement works, including SEV assessments on stream offset sites and diversions.</p>
<p>Graeme Silver for Department of Conservation (ID 5) Opposes the application in whole or in part</p>	
<p>12. Treating the existing environment in the Matariki forest section of the new highway in its post-harvest state creates an artificially low baseline. In the absence of a new highway designation, the forest would be replanted and the impacts of harvesting would be temporary on a time scale of about 10 years. The ecological values of a re-growing plantation forest will be permanently lost on the footprint of the new highway, and should be factored into the required mitigation of the highway.</p>	<p>Neutral on submission: The EclA has assessed the ecological values of the watercourse within the Dome Valley section considering both the existing environment as well as the anticipated post-harvest scenario at the time of construction. The SEV/ECR calculations to estimate the quantum of offset have relied upon the potential value of the watercourses within the Dome Valley; not the impacted postharvest state.</p>
<p>15. Another aspect of the application that is of concern is related to the long time interval before the consents will be exercised. This has limited the extent to which accurate baseline surveys of the existing environment can be completed before consent is granted. It has created a particularly heavy reliance on management plans</p>	<p>Neutral on submission: Lapse date addressed in Technical Assessment as a Matter to Note.</p>

<p>to identify, then mitigate, effects.</p> <p>26. During construction of the new highway 27.1 km of permanent and intermittent stream will be lost. Of this 18.3 km will be diverted and the applicant is not proposing to mitigate for this on the basis that the diverted streams will have equivalent ecological value. I do not agree with this assessment. Diverted stream have a simplified ecological structure and are often lined with artificial substrate. While a lower mitigation ratio may be appropriate for the diverted watercourses this effect must be addressed.</p>	<p>Support submission: Recommendations have been made to the proposed conditions to ensure the diversion designs achieve the anticipated outcomes and to have the diversion designs certified by Council.</p>
<p>27. The monitoring of freshwater impacts is reliant on the selection of representative streams. The choice of these should be independently reviewed and assessed to ensure adequate coverage. Normal practice is to survey all affected streams and it is not clear why that will not be done for this project. There is a significant risk that threatened or at-risk species may be undiscovered and adversely affected.</p>	<p>Support submission: Recommendations have been made to the proposed conditions to ensure the representative sites and assessment of ecological values, as well as, the survey of impacted sites are certified by Council.</p>
<p>30. I support the ratios proposed for mitigating loss of indigenous vegetation (6:1 and 3:1) but request that mitigation also be provided for the lost habitat values of the plantation forest.</p>	<p>Oppose submission: The applicant has not provided a transparent and quantified assessment to justify the proposed offset ratios or demonstrate a no-net-loss of ecological value outcome.</p>
<p>31. Areas being planted or enhanced for mitigation purposes should be protected by legal mechanism such as QEII covenants and fenced to a stock exclusion standard. The plantings should be managed and maintained for a period of at least 5 years to ensure their survival, and any failure during this period (such as due to drought) be replanted.</p>	<p>Support submission: Recommendations have been made to the proposed conditions to ensure offset sites are protected in perpetuity with a requirement for ongoing pest plant and animal control. Recommendations have been made to the proposed conditions to ensure monitoring</p>

<p>32. When the full scale of mitigation work required will not be known until the final alignment is confirmed and ecological surveys have been completed, we would encourage the applicant to commence ecological planting and rehabilitation work early so the suitable habitat for relocating fauna becomes available, and more suitable, during the course of construction. It is likely that existing suitable habitat for relocating fauna will already be occupied, so it will be necessary to establish new habitat for relocated fauna and carry out pest control in these areas.</p>	<p>and maintenance for a minimum of 5 years with at least 90% survival rate.</p> <p>Support submission: Reducing time lag between impact and the realisation of the proposed offsets results in improved ecological outcomes. At a minimum, recommendations have been made to the proposed conditions to ensure offset enhancement works are implemented within 2 years following the end of the earthworks season in which the impacts occurred.</p>
<p>David Mason and Dianne McCallum (ID 10641) Opposes the application in whole or in part</p>	
<p>There is an unidentified wetland located in the northern portion of the “Jackson” property at 83 Carran Road. This wetland adjoins WN_T_Mahu_02. [...] There are a number of wetlands on the corridor route that are likely to have not been identified as well as significant stands of bush that are now being impacted. This may, in part, be due to changes in the proposed designation since the start of the assessment process for ecological impacts.</p>	<p>Neutral on submission: It is possible some wetlands have been missed in the applicants limited representative ecological assessment. Having reviewed the wetlands identified by the applicant against various available datasets (including LCDB5, FENZ, Singers <i>et al</i>, 2017, and TR2017/024) it is considered that the applicant has identified the majority of potential wetlands within the designation. The application and recommended conditions of consent outline a suitable process to mitigate and offset any adverse effects of unidentified wetlands.</p>
<p>It is also of concern that existing depleted wetland /flood plain areas are being utilised for fill sites without regard to the potential for these areas on downstream flooding but</p>	<p>Support submission: Riparian flood plains and degraded wetland areas should be prioritised for</p>

<p>also for offset areas to restore rather than add to the depletion of wetlands more than is necessary.</p>	<p>enhancement over soil disposal.</p>
<p>We are concerned about the absence of detail around the recommended pre-construction ecological surveys and assessments for two reasons: the potential for flaws similar to those identified in the initial survey and the extent to which assessment results would be used to inform the final design (especially the alignment).</p>	<p>Neutral on submission: It is understood the main limitation leading to the limited representative ecological survey was land access. Following land acquisition, a more thorough assessment should be possible. Recommendations have been made to the proposed conditions to have the assessment of impacted watercourses and wetlands certified by Council.</p>
<p>It is inappropriate to have a weed and pest control program solely to assist the establishment of plantings and then walk away. Doing so merely creates an environment in which the pests can thrive once control ceases. And it does nothing to address the long-term threat caused by the road becoming a pest highway. These programs should be in perpetuity and cover existing bush and wetlands and both mitigation and landscape planting.</p>	<p>Support submission: Recommendations have been made to the proposed conditions to ensure offset sites are protected in perpetuity with a requirement for ongoing pest plant and animal control.</p>
<p>The AEE recommends that no piers be built within the Mahurangi River bed but is silent as to whether any work (temporary or permanent) is allowed in the river bed. A condition is required that prohibits any work in the bed of the Mahurangi River.</p>	<p>Neutral on submission: It is understood that consent is being sought for temporary works and structures within watercourses to enable Project Works.</p>
<p>We have serious concerns about the widespread use of management plans. This is exacerbated by the weak nature of the recommended conditions. [...]</p>	<p>Support submission: Recommendations have been made to the proposed conditions to provide council the ability to certify management plans along with providing more clarity on the matters to</p>

<p>The proposed weed and pest control is only for five years after plantings and then only for mitigation (and not landscape) plantings.</p>	<p>be included in management plans.</p> <p>Support submission</p> <p>Recommendations have been made to the proposed conditions to ensure offset sites are protected in perpetuity with a requirement for ongoing pest plant and animal control.</p>
<p><i>“Loss of wetland ecosystems through removal of vegetation and hydraulic changes and impacts on fauna resulting from loss of habitat; Scale of Effect with mitigation: Minor”</i></p> <p>This is wrong. Loss of wetland is always significant (RMA and AUP). And not all wetlands have been identified. These effects are significant.</p>	<p>Support submission</p> <p>It is considered that the residual adverse effects on the loss of wetlands following mitigation is significant.</p> <p>The applicant as proposed offset measures to address these residual adverse effects, however, has not provided a transparent and quantified assessment to justify the proposed offset ratios or demonstrate a no-net-loss of ecological value outcome.</p>
<p>This submission identifies a range of such qualified conditions (using “where practicable”, “if practicable”, “Best Practicable Option” etc) and where considered appropriate asks for them to be removed.</p>	<p>Support submission</p> <p>Use of such language is noted in this Technical Assessment and recommendations have been made to the proposed conditions to remove this language where appropriate</p>
<p>Add a condition(s) requiring pre-construction ecological surveys that:</p> <p>Include a walk-over of the entire Designation to identify all native bush and wetlands</p> <p>Identify any nationally or regionally threatened species of flora and fauna.</p> <p>Establish the current ecological value of all native bush and wetlands in accordance with the EIANZ Guidelines</p>	<p>Support submission</p> <p>Recommendations have been made to the proposed conditions to ensure this outcome</p>

<p>Add a condition that requires the results of the bush and wetland survey to be considered in the final Project design [...]</p>	<p>Support submission</p> <p>This adheres to the effects management hierarchy whereby priority should be given to avoiding adverse effects</p>
<p>Gena Moses-Te Kani for Hōkai Nuku (ID 10671) Supports the application in whole or in part</p> <p>Restrict streamworks within the Kōurawhero and Waiteraire awa (including water level changes) to the period Dec-March in order to protect breeding kōura females.</p>	<p>Neutral on submission:</p> <p>Recommendations have been made to the proposed conditions to ensure kōura are included in the Native Fish Capture and Relocation Plan.</p> <p>The effects and mitigation measures associated with potential sediment discharge are addressed by a separate council specialist</p>
<p>Notice of Requirement (NOR)</p>	
<p>Amanda and Erdem Oguz (ID 08): Opposes the NOR</p>	
<p>The proposed conditions favour the delivery of the project over the environment and affected parties. They are not robust enough to identify all adverse effects with certainty or ensure that the adverse effects will be adequately and fairly mitigated, proactively monitored and remedied.</p> <p>There is no degree of certainty whether predictions and are accurate, reliable or whether proposed mitigations are adequate.</p>	<p>Neutral on submission:</p> <p>The application and recommended conditions of consent outline a suitable process to identify impacted streams and wetlands following detailed design, and then mitigate and offset any adverse effects.</p> <p>Further recommended conditions have been provided to set limits to the extent of adverse effects on wetlands.</p>

	<p>Uncertainty in the assessment of effects associated with the diversion of watercourses and wetlands within soil disposal sites is noted within this Technical Assessment</p>
<p>Publish detailed Management Plans prior to Resource Consent being approved.</p>	<p>Neutral on submission:</p> <p>Finalised management plans may be difficult to develop based on an indicative alignment. However, draft management plans would be beneficial to demonstrate structure and anticipated material for which Council can certify the final plans against.</p>
<p>Due to the fact there are critically endangered kahikatea bush on the proposed route south of the tunnels by Kaipara Flats Road, we would be in favour of pushing the alignment east to minimise the impact on this section of bush.</p>	<p>Neutral on submission:</p> <p>This section of the indicative alignment is constrained by the Mahurangi left branch to the east and the headwaters of the Kourawhera stream to the west.</p> <p>The EclA notes: the movement of the alignment eastward will result in the Indicative Alignment coming closer to the high-value Mahurangi River (Left Branch) and may intrude into the riparian zone of the River.</p>
<p>Friends of Streamlands (ID 09): Opposes the NOR</p>	
<p>The proposed conditions favour the delivery of the project over the environment and affected parties. They are not robust enough to ensure that the adverse effects will be adequately mitigated and remedied</p>	<p>Neutral on submission:</p> <p>The application and recommended conditions of consent outline a suitable process to identify impacted streams and wetlands following detailed design, and then mitigate and offset any adverse effects.</p>
<p>Require the Authority to include in the application the various management plans so that an assessment of how the project will be delivered to meet the environmental</p>	<p>Neutral on submission:</p> <p>Finalised management plans may be difficult to develop based on an indicative</p>

<p>objectives can be assessed.</p>	<p>alignment. However, draft management plans would be beneficial do demonstrate structure and anticipated material for which Council can certify the final plans against</p>
<p>Wendy Patricia Court (ID 13): Opposes the NOR</p> <p>This application relies heavily on Management Plans which give no certainty Management plans are not robust enough</p>	<p>Support submission: Recommendations have been made to the proposed conditions to provide council the ability to certify management plans along with providing more clarity on the matters to be included in management plans.</p>
<p>Previous proposals used less land and only crossed the Mahurangi River once. The current proposal crosses the Mahurangi River FOUR times which clearly impacts more heavily on the river than is necessary. Require the application to be revised to build in more robust conditions to protect the Mahurangi River</p>	<p>Neutral on Submission The Technical Assessment has not reviewed previous proposals that do not form part of the application material It is considered that the application has taken an informed assessment in proposing the indicative alignment which has sought to minimise impacts on the Mahurangi River and wetlands through the use of bridges and avoidance of most high value wetland sites.</p>
<p>Dando Family Trust (ID 23): Opposes the NOR</p> <p>We have significant concerns about the impact of the construction on the waterways, flora and fauna both on our property and on the area as a whole. As stated above, we have invested significant efforts into re-establishing native trees and birds on our</p>	<p>Neutral on Submission The designation appears to only marginally encroach on the property 39 Philips Road with not streams or wetlands on this property impacted.</p>

<p>property</p>	<p>The application and recommended conditions of consent outline a suitable process to identify impacted streams and wetlands following detailed design, and then mitigate and offset any adverse effects</p>
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Warkworth to Wellsford Project – Air Quality Assessment

To: Nicola Holmes, Principal Planner – Resource Consents;
Wayne Siu, Planner – Plans & Places

From: Paul Crimmins, Senior Specialist – Contamination, Air & Noise

Date: 21 August 2020

1 Application details

Applicant's name: Waka Kotahi – New Zealand Transport Agency

Application number: BUN60354951 (Air discharge: DIS60355186)

Application purpose description: Notice of Requirement to amend the Unitary Plan and associated Regional Resource Consents to enable the construction, operation and maintenance for a new four lane state highway from Warkworth to Wellsford (Te Hana).

Activity considered: Discharge of contaminants into air

Site address: Multiple sites located between Warkworth and Te Hana, Rodney

2 Introduction: Air quality assessment

2.1 Scope of air quality assessment

As requested, I have reviewed the above Notice of Requirement (NoR) and Resource Consent (RC) application, relevant supporting information, and submissions received, on behalf of Auckland Council in relation to air quality effects.

This review pertains to the actual and potential effects arising from discharges of contaminants into air from the construction and operation of the proposed Ara Tūhono: Warkworth to Wellsford (WW2W) motorway. The air discharges considered by this review are limited to discharges of dust from construction works, and discharges of hazardous air pollutants (with potential human health effects) from vehicles using the future road.

With respect to greenhouse gas emissions from vehicles using the future road, section 104E of the Resource Management Act 1991 (RMA) specifically prohibits an assessment of climate change effects arising from an application to discharge contaminants into air. Currently, climate change effects are addressed at the national level as directed by the *Resource Management (Energy & Climate Change) Amendment Act 2004*.

The *RMA Amendment Bill 2019* passed its third reading in April 2020 and shall repeal section 104E of the RMA from 31 December 2021, so that resource consent applications lodged after this date may have greenhouse gas emissions assessed as an environmental effect with respect to National Emissions Reduction Plans. However, the transition measures detailed in Clause 26 of Schedule 12 of the 2019 Amendment apply to this application; I have therefore assessed the application without further consideration of greenhouse gas emissions and associated climate change effects.

2.2 Material reviewed

I have reviewed the following documents received as part of the application:

- *Assessment of Effects on the Environment: Warkworth to Wellsford Project*, prepared by the Jacobs GHD Joint Venture, dated March 2020 ('the AEE');
- *Warkworth to Wellsford: Air Quality Assessment*, prepared by the Jacobs GHD Joint Venture, dated March 2020 ('the AQ Report');

I have also reviewed all submissions received that are relevant to air quality effects.

2.3 Reviewer information: Qualifications and experience

My full name is Paul Edward Crimmins and I am employed as a Senior Specialist within the Contamination, Air & Noise Team of Auckland Council's Specialist Unit at Graham Street, Auckland Central.

I have been employed in this role since a restructure in October 2017 and in a similar Senior Specialist role since February 2013. Prior to this I was employed as a Consents and Compliance Advisor by Auckland Council and as an Environmental Scientist with Beca Limited. I have over ten years' experience in air quality assessments (human health and amenity effects).

I hold a Master of Science (First Class Honours) in Environmental Science from the University of Auckland (2018), and a BSc (Environmental Science) and BA (Politics) from the University of Auckland (2009). I am a member of the Clean Air Society of Auckland and New Zealand (CASANZ).

I have been involved with consenting and compliance for numerous air discharge permits throughout the Auckland Region over the past decade. Some examples include:

- Industrial air discharges (including NZ Steel, Pacific Steel, O-I Glass, Winstone Wallboards, Tasman Insulation, Southdown Power Station, Industrial Processors, numerous asphalt plants);
- Construction projects (including City Rail Link, America’s Cup Wynyard Quarter works, Waterview Tunnel, Northern Expressway Extensions, East-West Link);
- Waste facilities (including Whitford Landfill, Redvale Landfill; Mangere Wastewater Treatment Plant and biosolids fill; hazardous waste treatment facilities at Neales Rd, Miami Pde and Stonedon Dr; numerous refuse transfer stations).

3 Proposal: Air quality

3.1 Proposal as relevant to air quality

The applicant, Waka Kotahi – New Zealand Transport Agency (NZTA), is seeking an NoR and RCs to designate, construct and operate a 26 km four-lane highway between Warkworth and Te Hana, Rodney, to replace the existing SH1 Dome Valley alignment.. A full description of the application is provided in the AEE.

Particularly relevant to air quality:

- The proposed designation covers an area of approximately 1348 ha, within which it is proposed to design a four-lane highway for later construction.
- Construction shall involve bulk earthworks, in the order of 12.4 Mm³ cut and 9.6 Mm³ fill over 310 ha. Construction is expected to occur after 2030 and take approximately 7 years to complete. Construction discharge consents are sought for a 15 year duration with a 15 year lapse date.
- Section 4.2 of the AQ Report identifies 64 ‘High Sensitivity Receptors’ (HSRs, defined as dwellings) within 200 m of the designation boundary (including one HSR within the designation).
- A mobile rock crusher is proposed to be utilised to process excavated rock for on-site use as aggregate. The crusher is anticipated to have a processing capacity of 300 tonnes/hour.
- The indicative alignment includes a twin-bored tunnel, approximately 850 m long, below Kraack Road.
- It is predicted that 20,000 vehicles per day shall use the highway in 2036, increasing to 25,000 vehicles per day a decade later. Most of these predicted vehicle movements are offset by predicted decreases in traffic volumes on the existing SH1.

4 Reasons for application: Air discharges

4.1 Reason for application: Air discharges

Resource Consent is required for air discharges from the WW2W construction works under the provisions of the AUP(OP), Chapter E14 Air Quality:

Rule E14.4.1: Discharge of contaminants into air from dust generating processes

(A83): Earthworks and the construction, maintenance and repair of public roads and railways not meeting the general permitted activity standards [Restricted Discretionary Activity in all zones].

(A94): Crushing of concrete, masonry products, minerals, ores and/or aggregates (not associated with quarrying activities) at a rate:

- greater than 60 tonnes/hour; or*
- up to 60 tonnes/hour and not meeting permitted activity standards [Restricted Discretionary Activity in Rural zones].*

The scale of the earthworks are significant, to such a point that without management measures in place, compliance with the general permitted activity standards (E14.6.1.1) is not assured. Particularly, I consider there is a significant risk of offensive or objectionable dust effects arising at HSRs due to dust discharges from the large-scale earthworks that may not comply with standard E14.6.1.1(2).

This risk is highlighted in section 9.9.4 of the AEE:

Based on the potential number of HSRs that may be affected by construction dust, the effects of construction on air quality is assessed as being potentially significant and mitigation is recommended.

Therefore, I consider that a Restricted Discretionary Activity air discharge consent is required for the WW2W Project under Rule E14.4.1(A83). This is a similar approach to that taken for other significant construction projects with a high risk of dust effects, such as the Waterview Tunnel project and City Rail Link.

An air discharge consent is also triggered by the proposed use of a rock crusher with a crushing capacity greater than 60 tonnes/hour. This is a Restricted Discretionary Activity in rural zones (where it is proposed to utilise the crusher) under Rule E14.4.1(A94).

The applicable Restricted Discretionary Standards are provided in E14.6.3.4(3), matters of discretion in E14.8.1(1 & 6) and assessment criteria in E14.8.2.

The AQ Report raises E14.4.1(A90) (air discharges from a mineral extraction activity) as a reason for consent and not E14.4.1(A83). I consider the applicable rules are

E14.4.1(A83 & A94) and note that no ‘mineral extraction activities’ (defined by the AUP(OP) as ‘activities carried out at a quarry’) are proposed.

4.2 Notable permitted activities: Air discharges

Diesel and petrol-powered vehicles at the construction site and using the future road shall emit a range of hazardous air pollutants as part of their engine exhaust emissions.

Rule E14.4.1(A114) of the AUP(OP) states that engine emissions are a Permitted Activity without standards whether on- or off-road, given that exhaust emissions are regulated at a national level.

Non-exhaust emissions, most-notably dust discharged from vehicle movements across unsealed surfaces during the construction phase, are not permitted by this rule and are assessed as part of the above Restricted Discretionary air discharge consent.

While exhaust emissions are permitted by Rule E14.4.1(A114) without standards, I consider that the higher-order *Resource Management (National Environmental Standards for Air Quality) Regulations 2004* ([NES:AQ](#)) must be achieved. Therefore, the AQ Report has included an assessment to demonstrate that vehicle exhaust emissions using the road shall not cause an exceedance of the NES:AQ Ambient Air Quality Standards at any location where people are likely to be exposed. This assessment is briefly reviewed in section 5.3.3 below.

Section 3.5 of the AQ Report details a Permitted Activity assessment for air discharges from the proposed 850 m Kraack Road underpass tunnel against the provisions of AUP(OP) Rule E14.4.1(A116) and Permitted Activity Standard E14.6.1.18. This assessment concludes that the tunnel is a ‘low risk’ for air quality effects, particularly given the low number of HSRs in close proximity to the tunnel and low background (existing) air quality in the area. Therefore, **air discharges from the tunnel are a Permitted Activity under Rule E14.4.1(A116)**; I agree with this conclusion for the indicative alignment.

Section 5.2.3 of the AQ Report notes that further air quality assessment may be required if a substantial change in the alignment occurs that places the tunnel portals within 200 m of an HSR. However, I note that a resource consent would only likely be required for air discharges from a tunnel under Rule E14.4.1(A117) (Restricted Discretionary Activity) in an unlikely scenario where more than 50 HSRs are within 200 m of the tunnel portals and more than 50,000 vehicles per day use the tunnel.

5 Assessment of effects: Air quality

5.1 Applicant's air quality assessment

The applicant's air quality assessment is detailed in the AQ Report. The air quality effects considered are construction dust and exhaust emissions from vehicles using the new road.

The AQ Report concludes that the scale of earthworks and rock-crushing and proximity of HSRs presents a significant risk of offensive or objectionable dust effects if not adequately mitigated by dust management processes. The AQ Report recommends dust controls to be implemented throughout the construction works that would mitigate these risks so that the adverse dust effects are less than minor at all HSRs.

Overall, the AEE considers that construction dust shall be adequately mitigated by conditions of consent so that effects are no more than minor. The AEE concludes that operational air discharges are negligible and a Permitted Activity.

5.2 Submissions relevant to air quality

The submission from D. Mason & D. McCallum (JS1), residents at 211 Kaipara Flats Rd, Warkworth, raises specific concerns regarding potential construction dust effects. On page 30 of the submission, it is asserted that only dwellings to the east of the designation are assessed as HSRs by the AQ Report, due to the predominant South-Westerly winds. However, I note that the AQ Report does include all dwellings within 200 m of the designation and dwellings near to access roads as HSRs.

The Mason & McCallum submission usefully notes that summer-time winds include frequent North-Easterly winds that may result in dust being directed toward dwellings to the west. I agree with this statement, noting that North-Easterly winds are the second-most predominant across the region, and can be more frequent in summer (when construction dust is likely to be most significant) than South-Westerlies. Therefore, I consider that dust controls should be implemented to protect HSRs on both sides of the designation.

The Mason & McCallum submission also raises:

- The necessity of instrumental dust monitoring;
- The risk of drought periods for dust discharges;
- Dust discharges from the rock crusher, with a minimum separation distance of 500 m to HSRs sought;
- Objections to later development and certification of the air quality management plan;

- Experiences of dust from the P2Wk works, and the need for tighter dust controls;
- Potential health effects of dust, particularly as a result of deposition on roofs for rainwater collection systems;
- Potential ecological effects of dust.

The Mason & McCallum submission requests amended and additional conditions of consent to further minimise potential dust effects, as detailed on pages 34-35 of the submission. Further relief is sought by changes to the certification process for management plans and the establishment of an independent arbitrator, particularly for the resolution of complaints.

Specific mitigation measures for construction dust effects are sought by the Dando Family Trust (JS9), residents of 39 Phillips Rd, Warkworth. These include:

- Dust screens;
- Contingency measures for house and vehicle cleaning;
- The diversion of rainwater collection systems.

Transpower (NoR3) seek dust controls as NoR and RC conditions to protect electricity transmission infrastructure. Specifically, the submission includes proposed conditions that would require an Electricity Infrastructure Construction Management Plan (EICMP), to be drafted in consultation with Transpower. The EICMP shall require measures to minimise damage to Transpower's infrastructure from dust deposition during the WW2W construction works (submitter's proposed condition 25G(b)).

General opposition to the potential air quality effects of the WW2W Project were also raised by A. & G. Still (JS8) and A. & E. Oguz (JS10).

5.3 Assessment of air quality effects

5.3.1 Introduction to air quality assessment

My assessment of the application reviews aspects relevant to air quality, recognising that the alignment and construction methodology are yet to be selected. My review focuses on:

- Construction dust effects;
- Operational air quality effects arising from vehicles using the new highway.

5.3.2 Construction dust effects

I consider that the AQ Report provides a detailed assessment of the potential dust effects from construction of a highway within the proposed designation, undertaken in

general accordance with the *Guide to Assessing Air Quality Impacts from State Highway Projects* ('The Transport AQ Guide', NZTA, 2015) and the *Good Practice Guide for Assessing and Managing Dust* ('GPG:Dust', Ministry for the Environment, 2016).

I agree that the scale of earthworks and rock-crushing activities present a significant risk of nuisance dust effects at HSRs, requiring specific mitigation. I do not consider that notable health effects are likely to occur as a result of the dust emissions. The dust that may be discharged from the works (including that which may deposit on roof-water collection systems) shall largely comprise inert soil. As described by the GPG:Dust, the type of dust discharged from large-scale earthworks is generally of a larger size fraction (mostly greater than 10 µm in diameter) that settles within tens of metres from the source and is not inhalable.

The recommended dust mitigation measures are detailed in section 6 of the AQ Report and are proposed to be included within a Construction Air Quality Management Plan (CAQMP), required as a condition of consent. I consider the mitigation measures are in accordance with the best-practice recommendations of the GPG:Dust and can adequately mitigate dust discharges so that offensive or objectionable dust effects are unlikely to arise. The key mitigation measures I consider necessary are:

- The use of water to suppress dust, particularly from vehicle accessways and the rock-crushing plant;
- Minimising the open area of excavations and use of stabilising;
- Separation of notably dusty activities from HSRs (including the rock crusher by >100 m);
- Routine monitoring for weather conditions conducive to dust nuisance and dust discharges for immediate remediation;
- Sealing access roads with frequent construction traffic and in close proximity to HSRs and maintaining these in a clean state;
- Restricting construction traffic to low speeds (<15 km/hr) on unsealed accessways.

As detailed in the GPG:Dust, dust management is not complex and relies most on communication with neighbours and constant vigilance. NZTA's Mackays to Peka Peka Project is highlighted by the GPG:Dust as having exemplary dust management. I consider that a similar level of dust management should be achievable for the WW2W Project. The GPG:Dust also recommends the NZTA template for CAQMPs.

I have considered the suggestions for dust mitigation in the Mason & McCallum, Dando, and Transpower submissions. I consider these are generally unnecessary (greater separation distances, dust screens and provision of alternative water supplies), or could be implemented as contingency measures under the CAQMP in the event that visual monitoring and/or complaints indicate a significant dust risk.

I consider the dust risks to electrical infrastructure can be adequately mitigated by an EICMP and the CAQMP.

Overall, I agree that discharges of dust during the construction phase are not likely to cause significant adverse effects either to human receptors or to flora beyond the works area if the above mitigation measures (offered as conditions of consent) are implemented. I consider that the conditions of consent should require a specific CAQMP to detail the above dust mitigation measures and include a limit condition to avoid significant adverse dust effects.

5.3.3 Operational air quality: Exhaust emissions

As described above in section 4.2, discharges of hazardous air pollutants (HAPs) from vehicles are a Permitted Activity under the AUP(OP) without standards as they are controlled at a national level. However, in accordance with the Transport AQ Guide (NZTA, 2015), the AQ Report assesses the potential discharges of key HAPs from on-road vehicles using the 'Tier-2 Preliminary Air Quality Technical Assessment Methodology'. This method estimates the worst-case potential ambient concentrations of particulate matter (PM₁₀) and nitrogen dioxide (NO₂) arising from a given number of vehicles and background air quality concentrations alongside a road using conservative modelling parameters. Vehicle exhaust emissions comprise fine particulate, typically less than 2.5 µm in diameter, and the model's PM₁₀ results are therefore interpreted as PM_{2.5}.

The Transport AQ Guide has since been revised (NZTA, 2018), but the guidance regarding the Tier-2 assessment methodology has not notably changed.

The AQ Report predicts the worst-case ambient concentrations of PM₁₀ and NO₂ at worst-case receptors, including 211 Kaipara Flats Rd (the Mason & McCallum dwelling). The concentrations of PM₁₀/PM_{2.5} and NO₂ at these receptors are shown to be negligible under any modelled scenario, including sensitivity analyses where the traffic volume is doubled and highway alignment assumed nearer to the HSRs. All HAPs do not approach the relevant health-based ambient air quality assessment criteria, including the Ambient Air Quality Standards of the NES:AQ, when accounting for existing background concentrations.

I consider that regardless of where the highway alignment is placed within the proposed designation, operational air discharges (vehicle exhaust emissions from the highway and tunnel) are not likely to cause adverse air quality effects.

5.3.4 Assessment of air quality effects conclusion

I consider the air discharges arising from the construction and operation of the WW2W Project are not likely to cause significant adverse effects provided that appropriate construction dust management measures, as proposed by conditions of consent, are implemented. I recommend minor amendments to the proposed conditions of consent to further avoid, remedy and mitigate potential dust effects, as detailed below.

6 Statutory considerations

6.1 Statutory considerations: Section 104(1)(b)

In section 11.2 of the AEE, the applicant assesses the site's air discharges against the relevant statutory planning documents. I consider that the relevant statutory documents for assessing the air discharges from the WW2W Project are the NES:AQ and AUP(OP).

6.1.1 Resource Management (National Environmental Standards for Air Quality) Regulations 2004

As above, the operational air discharges are not predicted to cause ambient air quality to approach the NES:AQ Ambient Air Quality Standards for PM₁₀, NO₂ or any other scheduled air pollutant. Further, I consider that the proposed mitigation measures for construction dust shall ensure that PM₁₀ concentrations beyond the works boundary shall comply with the relevant NES:AQ standard. The Auckland Rural Airshed, within which the WW2W works are to occur, is not defined by NES:AQ Regulation 17 as a 'Polluted Airshed'. Therefore, I do not consider the NES:AQ restricts the grant of the NoR or consent.

6.1.2 Auckland Unitary Plan (Operative in Part)

At a Regional Policy Statement (RPS) level, I consider that the likely air discharges from the WW2W Project comply with all relevant RPS objectives and policies, as contained in Chapter B7.5 of the AUP(OP). Notably, the construction dust management measures to be employed shall adequately avoid significant health and amenity effects.

At a Regional Plan level, relevant objectives and policies for air discharges are contained in Chapter E14 Air Quality. I consider that the proposal complies with these objectives and policies as air quality shall be generally maintained and significant adverse effects shall be avoided.

In accordance with Policy E14.3(1), no exceedance of the Auckland Ambient Air Quality Targets is predicted to occur either during the construction or operational phases. Therefore, I do not consider that significant adverse effects to human health are likely to occur as a result of the air discharges.

Offensive and objectionable amenity effects or other significant adverse effects are not likely to occur provided that the proposed mitigation measures are employed, in accordance with Policies E14.3(1 & 3). I consider the proposed dust management measures, as defined by the proposed conditions of consent and to be further detailed in a CAQMP, shall suitably mitigate the potential for offensive or objectionable amenity effects or significant effects to human health to arise during the construction phase.

Policy E14.3(8)(a) requires the use of the Best Practicable Option (BPO) for management measures. I consider that the outline of these proposed measures in the AQ Report fulfils this requirement, as they generally align with those recommended by the GPG:Dust, and note that they shall be further detailed in a CAQMP.

6.1.3 Statutory considerations conclusion

I conclude that the WW2W Project's air discharges are consistent with the relevant provisions of all applicable plans and policy statements, subject to compliance with the recommended conditions of consent.

6.2 Matters relevant to discharge or coastal permits (Section 105) and restrictions on certain permits (Section 107)

I consider that the provisions of section 105 as relevant to air discharges have been met as it has been determined that there are no significant air quality effects. It is further considered the applicant's reasons for the discharges of contaminants into air are appropriate in the circumstances.

Section 107(1) of the RMA places restrictions on the granting of certain discharge permits that would contravene sections 15 or 15A of the RMA. I do not consider that section 107 matters are relevant to the air discharges from the proposal, noting that dust discharges are to be managed so that significant effects to water shall be avoided.

6.3 Conditions of consent: Section 108

The Applicant has proposed a set of conditions for the air discharge consent, dated 13 May 2020. I generally support these conditions as adequate to avoid, remedy and mitigate adverse dust effects from the WW2W Project. I recommend some minor amendments to the conditions to further minimise dust effects and ensure the conditions are effective, following my experience with similar infrastructure works.

The recommended wording of the conditions generally follows the recommendations of the GPG:Dust and other consents granted for similar air discharge activities in the Auckland region as these have proven effective for the control of adverse effects.

As below, I do not consider it necessary to replicate these conditions on the NoR, as air discharges from all construction activities shall be regulated by the RC conditions.

Under section 123 of the RMA, I agree that a 15 year duration is appropriate for the air discharge consent.

7 Recommendation

7.1 Adequacy of information

The above air quality assessment is based on the information submitted as part of the application. I consider that the information submitted is sufficiently comprehensive to enable the consideration of air quality matters on an informed basis:

- The level of information provides a reasonable understanding of the nature and scope of the proposal as it relates to air quality.
- The extent and scale of any adverse air quality effects are able to be assessed.
- Persons who may be adversely affected are able to be identified.

7.2 Recommendation

The above air quality assessment does not identify any reasons to decline the RC and NoR, and I consider the application could be granted with conditions for the following reasons:

- I consider that the adverse effects on the receiving environment as a result of air discharges are less than minor, when considering the dust management measures to be implemented.
- Discharges of dust can be adequately controlled by the proposed management measures outlined by the AQ Report and to be further detailed by the CAQMP and conditions of consent so that offensive or objectionable effects are not likely to occur beyond the boundary of the site.
- I consider the proposed dust management measures generally comply with the Best Practicable Option, noting that they are in general accordance with the recommendations of the GPG:Dust.
- Any unexpected discharges of dust can be responded to using contingency measures within the CAQMP to remedy adverse effects.
- Discharges of PM₁₀, PM_{2.5}, NO₂ and other hazardous air pollutants are not expected to cause an exceedance of the relevant ambient air quality criteria as contained within the NES:AQ and AUP (OP) in either the construction or operational phase.
- I consider that the proposed air discharges are consistent with the relevant provisions of the NES:AQ, AUP(OP), and in particular, the integrated management of the air resource.

- I consider the WW2W designation and the proposed highway within this designation has generally adequate separation distances to sensitive receptors so that air quality effects can be effectively mitigated.

7.3 Recommended conditions

I recommend that the proposed conditions of the RC (13 May 2020) are generally appropriate for air quality matters, but recommend some minor amendments.

I recommend that air quality can be adequately managed by conditions of consent within the air discharge consent for all construction works and it is unnecessary to replicate these conditions within the Designation. I recommend that proposed NoR conditions 86 to 88 (proposed NoR Conditions dated 12 May 2020) can be deleted, along with reference to the CAQMP in NoR conditions 4-6. The CAQMP would then be certified as a matter of consent compliance under the air discharge RC only, in a similar manner to the Erosion & Sediment Control Plan for the earthworks RCs.

I recommend minor amendments to the following proposed RC conditions for the reasons provided:

- RC Condition 101: The proposed wording for this limit condition was similar to an example of a 'poorly worded condition' in the *Good Practice Guide for Assessing and Managing Odour* ([Ministry for the Environment, 2016, p.25](#)). Although it set an intention to 'avoid as far as practicable' offensive or objectionable air quality effects, it did not set a clear and enforceable limit against these effects. I recommend the limit condition with wording in accordance with the recommendations of the GPG:Dust. While dust is the most-likely air discharge, I recommend retaining the proposed limit wording for 'dust, odour and fumes' to ensure that the consent suitably limits any potential air discharges. This condition should also set a requirement that dust is minimised as far as practicable in accordance with the measures detailed by the CAQMP.
- 102(a, c & d): Dust is to be minimised from all construction activities, not only from operation of the rock crusher.
- 102(d): I preferred a previous version of this list included in the proposed condition set 27 May 2019, as it was more comprehensive in the list of dust mitigation methods. I recommend these methods are required to be addressed within the CAQMP (not only 'potentially included'), noting they were detailed by the AQ Report as necessary to avoid significant dust effects.
- 102(e): New sub-point, re-introduced from earlier 27 May 2019 draft conditions to specifically require dust management measures relating to vehicle movements, which in my experience are the greatest source of dust at large-scale earthworks sites.

- 102(f): New sub-point, re-introduced from earlier 27 May 2019 draft conditions to specifically require checks on engine exhaust emissions, to minimise HAP discharges and resulting off-site health effects.
- 102(i): Not only offensive or objectionable dust requires remedial management.
- 103: The CAQMP is required to be certified by Council as it is required by Restricted Discretionary Activity Standard E14.6.3.4(3). The Management Plan conditions (proposed conditions 3-7 & Table 2) state that the CAQMP is to be submitted for certification.

I recommend the following RC conditions relevant to air quality (with changes to the proposed wording underlined and strike-through):


Air Quality

101. Discharges of dust, odour or fumes shall not cause offensive or objectionable effects at any location beyond the boundary of the Site, in the opinion of an enforcement officer when assessed in accordance with the *Good Practice Guide for Assessing and Managing Dust* (Ministry for the Environment, 2016). The Consent Holder shall ensure that dust management at the Site is undertaken in accordance with the CAQMP and minimises dust generation as far as practicable. ~~The Consent Holder shall avoid, as far as practicable, objectionable or offensive odour, dust and fumes arising from the operation of a rock crusher, beyond the boundary of the Designation impacting on HSRs.~~
102. The Consent Holder shall prepare a Construction Air Quality Management Plan (CAQMP) to outline the measures to be adopted to meet condition 101. The CAQMP shall be prepared by a Suitably Qualified and Experienced Person and shall include:
- a. A description of the works, and periods of time when emissions of odour, dust or fumes might arise from the Construction Works, including operation of the rock crusher;
 - b. Identify the location(s) of any mobile rock crusher for the duration of construction
 - c. Identification of HSRs that may be adversely affected by emissions of odour, dust or fumes from the ~~rock crusher~~ Construction Works;
 - d. Methods for mitigating dust that may arise from ~~mineral extraction and the Construction Works~~ potentially including watering for dust suppression, minimising open earthwork areas, limiting earthworks during high winds, minimum setbacks from HSRs where necessary, emissions control equipment (e.g. enclosure and/or water sprays at transfer points), and monitoring of weather conditions and visual inspections;
 - e. Measures to manage adverse dust effects generated by construction traffic on unsealed roads, which may include metalling of yards and access roads, controlling vehicle speeds, and sealing sections of road where construction traffic shall be close to a dwelling;
 - f. Methods for maintaining and operating construction equipment and vehicles to minimise visual emissions of smoke from exhausts;

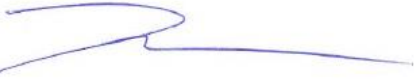
- g. Methods for undertaking and reporting on the results of daily inspections of Construction Works that might give rise to odour, dust or fumes;
 - h. Methods for monitoring and reporting on the state of air quality during Construction Works, including wind speed, wind direction, air temperature and rainfall;
 - i. Methods to remediate ~~offensive and objectionable~~ adverse dust deposits from Construction Works on HSRs, potentially including cleaning exterior surfaces of houses or driveways and/or cleaning of water tanks and replenishment of water supplies.
 - j. Procedures for maintaining contact with stakeholders and notifying of proposed construction activities, with reference to the SCMP, including complaints procedures;
 - k. Construction operator training procedures; and
 - l. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).
103. The CAQMP shall be submitted to the Council for certification in accordance with the conditions titled “Management Plan Certification Process”. When preparing the CAQMP the Suitably Qualified and Experienced Person shall have regard to the guidance contained in the *Good Practice Guide for Assessing and Managing Dust* (Ministry for Environment, 2016) and the *NZ Transport Agency Guide to assessing air quality impacts from state highway projects* (version 2.3, October 2019), or any subsequent version.

8 Review

8.1 Memo and technical review prepared by:

<p>Paul Crimmins <i>MSc(Hons), BA</i> Senior Specialist</p> <p>Contamination, Air & Noise Specialist Unit Resource Consents</p> <p>Date:</p>	 <div style="border: 1px solid black; width: 100%; height: 40px; margin-top: 5px;"></div> <p>21 August 2020</p>
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8.2 Memo reviewed by:

<p>Jared Osman <i>BSc(Hons)</i> Team Leader</p> <p>Contamination, Air & Noise Specialist Unit Resource Consents</p> <p>Date:</p>	 <div style="border: 1px solid black; width: 100%; height: 40px; margin-top: 5px;"></div> <p>26/08/2020</p>
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Memo: Contaminated Soils

23 July 2020

To: Blair Masefield (Project Manager), Nicola Holmes (Principal Planner – Resource Consents), Wayne Siu (Planner – Plans & Places)

From: Paul Crimmins, Senior Specialist – Contamination, Air & Noise

Subject: Warkworth to Wellsford Project (Notice of Requirement & Resource Consent Application BUN60354951): Contaminated soils memorandum

NZTA Waka Kotahi seeks a Notice of Requirement (NoR) and resource consents to designate, construct and operate a 26 km four-lane highway between Warkworth and Te Hana, Rodney, to replace the existing SH1 Dome Valley alignment.

I have reviewed this proposal with respect to the requirements of the *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011* ([NES:CS](#)) and Chapter E30 of the *Auckland Unitary Plan (Operative in Part)* ([AUP\(OP\)](#)). As part of this review, I have reviewed the following documents:

- *Warkworth to Wellsford: Assessment of Effects on the Environment*, prepared by the Jacobs GHD Join Venture, dated March 2020 ('the AEE');
- *WW2W Contaminated Land Assessment*, prepared by GHD and Jacobs, dated 16 February 2018 ('the CLA').

The proposed designation covers an area of approximately 1348 ha, within which it is proposed to design a road alignment for later construction. Construction shall involve bulk earthworks, in the order of 12.4 Mm³ (cut) over 310 ha. Soil contamination is considered in sections 6.2.7, 9.11 and 11.2.6 of the AEE.

The AEE concludes that the later detailed design process shall determine if soil contamination consents are required for the soil disturbance activities for the selected alignment and construction methodology. If required, separate consent applications under the NES:CS and/or AUP(OP) Chapter E30 would be lodged following this detailed design process and prior to the works occurring.

The CLA concludes that soil contamination within the proposed designation boundaries is not likely to be a significant risk for the Project and could be appropriately managed. Some 'moderate risk' activities were identified within the designation boundaries, being activities included in the *Hazardous Activities and Industries List* (HAIL, Ministry for the Environment, 2011); however, none of these appear likely to have caused widespread or significant soil contamination.

I accept the rationale for not applying for consents under the NES:CS the AUP(OP) Chapter E30 at this stage, noting that the need for these consents may be impacted by the exact location and extent of earthworks to be determined at a later date. A further reason for delaying the applications for soil contamination consents is that land-use changes could occur to out-date the Feb-18 CLA in the period before works start.

It is likely that the future applications for consents under the NES:CS and Chapter E30 of the AUP(OP) would need to be supported by a revised edition of the CLA, revisiting if any changes have occurred to sites currently deemed to have low or moderate risks for soil contamination. This revision would also focus more specifically on those areas where earthworks are to occur.

I recommend that an advice note or similar should be included within the Consent noting the absence of soil contamination authorisations and the potential requirement for further consents prior to works. The wording I recommend for this advice note is:

Advice Note: Soil Contamination

Consents have not been granted regarding potential human health effects from contaminated soils under the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 or contaminant discharges under Chapter E30 of the Auckland Unitary Plan (Operative in Part). Depending on the final location and extent of earthworks and risks of soil contamination present, further investigation and consents may be required.

Paul Crimmins
MSc(Hons), BA
Senior Specialist



Contamination, Air & Noise | Specialist Unit | Resource Consents

Date:

23 July 2020

Technical Memo –Specialist Unit

To:	Wayne Siu, Resource Consent Planner – Auckland Council Nicola Broadbent, Designation Planner – Auckland Council
CC:	Andrew Benson, Team Leader - Coastal and Water Allocation, Auckland Council Blair Masefield, Project Manager – Lands and Survey Ltd
From:	Sian France, Technical Director – Hydrogeology, Beca Ltd
Date:	18/08/2020

1.0 APPLICATION DESCRIPTION

Application and property details

Applicant's Name:	Waka Kotahi – New Zealand Transport Agency
Application purpose description:	Notice of Requirement to amend the Unitary Plan and associated Regional Resource Consents to enable the construction, operation and maintenance for a new four lane state highway from Warkworth to Wellsford (Te Hana).
Relevant application numbers:	BUN60354951. The individual resource consent application numbers are: LUC60354952, LUS60354955, WAT60354953, WAT60355184, WAT 60356979, DIS60354954, LUC60355185, DIS60355186
Site address:	Multiple sites located between Warkworth and Te Hana.

2.0 ADEQUACY OF INFORMATION

The assessment below is based on the information submitted as part of the application. In particular, I have reviewed the following documents:

- Report entitled “*Warkworth to Wellsford Assessment of Effects on the Environment*” prepared by NZTA dated March 2020;
- Report entitled “*Warkworth to Wellsford Hydrogeology Assessment*” prepared for NZTA by Jacobs GHD, dated July 2019;
- Drawing set entitled “Warkworth to Wellsford Project: Groundwater Longitudinal Section” prepared for NZTA by Jacobs GHD, drawing numbers GW-011 to GW-020, rev 0 July 2019;
- Drawing set entitled “Warkworth to Wellsford Project: Proposed Designation Plan” prepared for NZTA by Jacobs GHD JV, drawing numbers R-130 and R-139 and R-181 to R-182, rev 0 July 2019;

- Drawing set entitled “Warkworth to Wellsford Project: Groundwater Longitudinal Section” prepared for NZTA by Jacobs GHD JV, drawing numbers GW-011 to GW-020, rev 0 July 2019; and
- Letter report entitled “Notice of Requirement and Resource Consent Applications – response to Auckland Council’s request for further information” from Brad Nobilo to cath@eclipseplanning.co.nz, dated 3rd August 2020

The level of information provides a reasonable understanding of the nature and scope of the proposed activity as it relates to the relevant groundwater rules in the AUP: OP.

I do have reservations regarding the conceptualisation, approach to and the results of the groundwater modelling, and therefore, I consider it likely that the magnitude and extent of groundwater drawdown has been underestimated in some areas.

Notwithstanding these reservations, based on previous experience and given the current rural and isolated nature of the site, I agree it is likely that the **effect** of such drawdown, in terms of risk to surface water bodies, existing well users and / or potential for consolidation settlement, will be “less than minor”.

I consider that there remains some residual risk of adverse effects on the environment should drawdown be greater, but it is sufficiently low that it can be managed via conditions of consent.

3.0 ASSESSMENT OF EFFECTS

3.1 PROPOSED ACTIVITY

A full description of the proposed works is provided in the Application documents. With regards to potential for groundwater effects, the following project elements have been considered:

- Temporary dewatering of ~850 m long and ~180 m deep, twin bored tunnels under Kraack Road, Hoteo South;
- Long term dewatering of 21 No. significant cuts through the forestry area to the west of the existing SH1 (west of Dome Valley) and other areas of cut along the remainder of the Project. The cuts range in depth from 12 m to 55 m; and
- Grade separations at local road connections.

3.2 NEED FOR CONSENT

AUP Standards E7.6.1.6 and E.7.6.1.10 provide details of permitted groundwater take and diversions. The proposal has been assessed against these standards and does not comply for the following reasons:

- Dewatering and groundwater level control will occur for the long-term operation of the road cuts and hence the take cannot meet AUP Standard E7.6.1.6 (2) and (3),

and the diversion is not Permitted (as set out below); and

- Excavations for the road alignment will exceed 1 ha in total area and 6 m depth below natural ground level and hence the diversion cannot meet AUP Standard E7.6.1.10 (2).

The proposal is a Restricted Discretionary Activity and a consent is required under AUP E7.4.1 (A20 and A26).

For the purpose of the groundwater review, the effects of both consolidation and mechanical settlement arising from the project are considered to be cumulative and hence have both been considered in this technical memo.

Land Disturbance associated with earthworks is a Restricted Discretionary activity, and the matters for discretion under E12.8.2 (1) includes for the consideration of the effects of “...the stability and safety of surrounding land and, buildings, and structures”.

A review of any assessment related to Land Disturbance is not within the scope of this memo, however we note the potential for some overlap with the consideration of mechanical settlement presented here, and potentially also in the conditions of consent which we recommend be reviewed by the Processing Planner.

3.3 CONCEPTUAL GROUNDWATER MODEL

A full description of the adopted geological model is provided in the Application documents.

I concur with the geological model adopted in terms of the expected distribution of geological units along the alignment and in profile.

In general, I agree with the conceptual groundwater model in terms of discretisation of units based on expected behaviour, regional groundwater flow, aquifer recharge and existing groundwater / surface water connections.

However, I disagree with the baseline hydraulic conductivity value that has been adopted for the Pakiri Formation. The Pakiri Formation is the unit most likely to be encountered in the cuts and tunnels. In the absence of other factors, it can generally be expected that groundwater drawdown and inflows will be in some way proportionate to hydraulic conductivity i.e. the results of the analysis will be dependent on this parameter.

In-situ testing has been undertaken at a range of depths, but in only two boreholes along the ~27 km length of the alignment (BH1006 and BH1042). This testing resulted in a range of values from 3×10^{-8} m/s to 9×10^{-6} m/s, with a median value of $\sim 3 \times 10^{-6}$ m/s (and geometric mean of 8×10^{-7} m/s). The assessment of effects adopted 1×10^{-7} m/s as the representative hydraulic conductivity, which appears to be based on the range of commonly adopted values for the broader Waitemata Group. However, I note that this adopted value is 30x lower than the median and 8x lower than the geomean of the available project-specific tests.

The highest results are associated with BH1006 and photos included in the Hydrogeology Report indicate the rock is highly fractured at this location. The test results at this location (showing hydraulic conductivities ranging from 3×10^{-6} m/s to 7×10^{-6} m/s) and the prevalent fracturing is consistent with my experience of Pakiri Formation in the Warkworth and Wellsford areas. As the unit is often stronger than typical Waitemata Group, it tends to be more brittle and able to sustain open fractures which allow groundwater flow.

In the absence of site-specific testing for boreholes which are closest to the modelled cuts, I have reviewed the geological logs and core photos, and given the observed fracturing in these cores, I consider that the adopted value of 1×10^{-7} m/s is too low. In my view, the same fractured conditions at BH1006 may also be present elsewhere along the alignment and so in the absence of more widespread hydraulic conductivity testing, I consider that the modelling should have adopted the median of the project values ($\sim 3 \times 10^{-6}$ m/s), rather than a common Waitemata Group value. The implication being that inflows to the excavation, and extent of drawdown could be underestimated by using a value that is too low.

The Applicant has provided sensitivity checks in response to a s92 request, using a value that is closer to the median, though still much lower than upper bound of all tests. The results of the sensitivity check confirm that the magnitude and extent of drawdown would be greater under such conditions. As described below, this sensitivity check has been done independent of other modelling checks and so whilst the apparent change appears small, I consider it could be much greater when coupled with other modelling observations.

No testing has been undertaken in the Northland Allochthon. I agree that the adopted value is generally representative of the expected mass condition of rock but would note that where the unit is more highly fractured, that the hydraulic conductivity could be greater than adopted. This would again have implications for the calculated extent of drawdown.

3.4 NUMERICAL GROUNDWATER MODELLING

I have some reservations with the numerical groundwater models that have been presented for the cuts. Specifically:

1. The conceptualisation of the geology has been dictated by the model set-up, rather than the other way around. This could impact the simulation of existing conditions.
2. The existing base case model already incorporates the geometry of the cut. The results indicate that this is affecting the simulation of existing conditions.
3. Boundary conditions have been changed between the existing model and the predictive model, which could have a significant influence on the groundwater inflow and drawdown estimates;
4. The base case modelling is based on the low hydraulic conductivity described above which may be too low in some areas;
5. The models do not account for any drainage below the road network; the model therefore uses a no-flow boundary at the road surface which likely leads to an

underestimate of the groundwater inflows to the excavation;

6. The base modelling assumes steady state conditions i.e. that the groundwater system would reach equilibrium within 30 days, rather than considering the long-term duration of the consent being sought; and
7. Drawdown has not been specifically assessed from the models, but rather the groundwater inflows from the model have then been input to a predictive equation developed for calculating radial drawdown around a well.

The s92 questions sought further detail around the impacts of the above observations. The most critical being the assumption of steady state effects after 30-days, as my experience has been that drawdown in these geological units can take months to years to reach a steady state.

The further detail provided in response to the s92 questions has now confirmed that the 30-day models had not reached steady state and whilst the Applicant has now extended the modelling for a 3-year duration, the results of this in my view, are still indicating that groundwater conditions have not reached steady state. Whilst I agree that the results for the revised 3-year model indicate that the rate of change after three years and at distance from the cut is small, the revised time frame has been analysed independent of the sensitivity check on hydraulic conductivity (i.e. only the adopted value of 1×10^{-7} m/s has been considered).

I consider it likely that if the base model assumed the median project-specific hydraulic conductivity ($\sim 3 \times 10^{-6}$ m/s) **and** was run for the long term scenario, that the magnitude and extent of drawdown at the end of the consenting period would be greater than that presented in the Application. Additionally, I consider this effect would be further compounded for the analysis at CH34900 which appears to have underestimated the starting groundwater level.

Whilst I expect that the drawdown will be greater than that assessed by the Applicant, as set out in the subsequent sections in terms of the likelihood and consequence of effects, I do agree that overall, these are likely to be less than minor. Given the lack of site-specific testing and uncertainty in the final design, I consider that the groundwater impact assessment will need to be updated to confirm the likely effects and whether specific monitoring is required in any areas.

The Hydrogeology report contains less details on the tunnel model set-ups and I expect the concerns raised in points 3, 4 and 7 above will also apply. However, as the tunnels are only drained for a finite period of time whereas the cuts will be drained long-term, I expect the model's potential to have underestimated drawdown will be more critical for the cuts.

3.5 POTENTIAL FOR IMPACTS ON GROUNDWATER USERS

The Hydrogeology Assessment identified 119 boreholes that are located within 2 km of the indicative alignment. Of these only nine are located within the proposed designation boundary.

All but one of the bores within the designation are located near the Warkworth end of the alignment, are shallow and are understood to be screened in alluvium. There are no cuts in this area, and on this basis, the Applicant considers that there would be no effect on the wells. I agree that where there is no cutting below the groundwater level, no impacts on shallow wells would be expected.

The remaining bore is located within the designation, directly under the indicative alignment in which case the bore is not expected to be maintained; I agree it is reasonable to exclude this bore on the basis it will likely be within the works area.

Even where known bores are present beyond the designation, none are reported to be within the calculated drawdown profiles. However, as set out above, I consider that the drawdown profiles may underestimate the magnitude and extent of drawdown in some areas.

Noting my reservations with the model, I did undertake an alternative simple analysis (based on steady state drawdown and the median project-specific hydraulic conductivity value). Based on this model as well as my previous experience of deep drained excavations, in my view, it is possible that drawdown of ~1 m could extend for 200 m to 300 m from the alignment (compared to the 100 m to 150 m presented in the Application).

I have reviewed the updated bore plans provided as part of the s92 response. I note that the s92 response indicates that the database search was undertaken in 2017 and so might not include all current bores. I also note that there are bores in some areas which are within 300 m of the designation. Hence, it is possible that if the alignment is moved to the edge of the designation, that drawdown might manifest in some bores.

Where the bores are deep and screened in rock, it is possible that they can readily accommodate such drawdown without noticeable effects on operation. However, shallow bores (if present), will have less available drawdown and could be more significantly affected by even small amounts of drawdown should it occur.

I agree that generally the deepest cuts are in the forestry area and hence there may be low likelihood of private bores. However, the application seeks to retain flexibility for the cuts to be located immediately adjacent to the designation boundary, and presumably this might also alter the vertical alignment, which in turn could result in drawdown in areas (and bores) not currently considered.

I consider the risk is sufficiently low that it could be managed via a condition requiring a bore survey prior to commencement of dewatering. The survey would need to cover all private properties located within the calculated extent of drawdown, based on an updated assessment of drawdown at the detailed design stage.

3.6 POTENTIAL FOR IMPACTS ON SURFACE WATER BODIES

The Hydrogeology Report concluded that there are no specific streams within the drawdown profiles of the cuts, and so it is considered that there will be no effect on stream baseflow as a result of the excavations for the Indicative Alignment.

A recommendation was made in the report, that works near watercourses should be designed to avoid adverse effects on stream baseflow, and that if detailed design of the Project requires an excavation that extends below the groundwater table and within 200 m of a stream, that the change in stream baseflow should be assessed. I agree this approach is prudent and suggest it form a condition of consent. However, I would recommend extending the assessment zone from 200 m to 500 m to account for the likelihood that the extent of drawdown could be greater than that presented in the Application.

Several gullies were also reported to be located within the calculated drawdown profile of the tunnels. An assessment of the potential for stream depletion was undertaken which indicates a potential depletion of 0.15 L/s. Given the assessment method, I consider that this will likely result in a conservative estimate. The report concludes that this level of depletion is unlikely to “*be detectable over and above the influence of surface runoff*”. The degree to which an effect might be detectable would depend on the baseflows in the stream which are not known, but in general, I agree this would likely be the case for the tunnels (as the deep groundwater system, within which the tunnels will be constructed, is less likely to be directly connected to surface water).

The Hydrogeology Report notes that in areas where alluvium has infilled paleo-valleys, groundwater may be a more significant contributor to baseflow in the larger streams, rivers and wetlands. The report notes that “*this is the case for wetlands 17A – 24, as identified in the Ecology Assessment Report, at 89D Phillips Road. These wetlands are predominately surface water fed by the numerous streams flowing off the slopes to the north, however, many of these streams will be fed from springs / seeps high up in the catchment rivers*”

Appendix H of the Ecology report indicates that “Wetlands 17A – 24” refers to wetlands WN_W_Koura_02 and WN_T_Koura_01. A cutting of up to 6 m is possible along the alignment in this area; however, based on the geological long section, the cut is expected to be above the “inferred groundwater level” and this appears to be supported by the nearest test pit log.

On the basis of the above, I agree that overall, the risk of adverse effects on the stream baseflows and wetlands is likely to be low, but as with the bore interference, I recommend that the conditions of consent should include an update to the assessment of impact on surface water bodies once the final design is determined.

3.7 POTENTIAL FOR GROUND SETTLEMENT

The AEE notes that ground settlement effects will be “no more than minor”, and this appears to be based on the earlier Geotechnical Appraisal Report (GAR). I agree in general, that the risk of damage due to consolidation settlement is low where the drawdown is wholly within rock.

However, should drawdown extend to areas where residual soils or alluvium is present then some settlement is possible. Owing to the current rural nature of the site, I agree that the consequence of settlement should it occur is low.

The GAR identifies that drawdown from two of the larger cuts (between Ch31200 to

Ch34200) could extend towards the existing Marsden Point – Wiri Station oil / gas pipeline and that settlement is “*expected to be less than 10 mm and within the asset’s tolerance*”. No calculations have been provided and so I cannot comment on the suitability of parameters or methods used.

I understand that this pipeline will need to be relocated and that a designation condition has been proposed requiring utility protection measures to be agreed with the relevant Network Utility Operators. Given the overall low risk, I am comfortable that such a condition is an appropriate management tool.

4.0 SUBMISSIONS

Due to the large volume I have not read all the submissions, but I have been directed to two submissions which specifically comment on groundwater matters.

Watercare Services Limited (JS4)

From my reading of the submission, I understand that the primary groundwater concerns are the potential impact on the quantity of surface water and groundwater due to drawdown, and construction damage to pipelines that might be running under the alignment.

The risk of impact on groundwater and surface water quantity is tied to the extent of drawdown, which is my primary concern around the duration simulated in the model. The greatest risk is the cuts from Ch33000 to Ch35800 which are located between 300 m to 600 m from the Wayby River, the surface water source for Wellsford. If drawdown at this location is closer to the upper bound that I have discussed above, then it is possible that drawdown could extend to the river.

The exact impact on surface water flows is difficult to quantify without a specific depletion assessment, site specific hydraulic conductivities and simultaneous river gaugings to confirm the groundwater component of baseflow. The impact may not be significant if the base flows in the river are sufficiently high.

The Applicant has proposed that further assessment of streams within 200 m of cuts be undertaken at detailed design, and I have recommended that this is adopted as a condition but updated to include all streams within 500 m of the relevant cuts. This would extend the condition to include this area also.

Regarding the risk of settlement damage to pipelines, this will be dependent on the geological profile, groundwater drawdown and resultant settlement profile, and the location, depth, age and material of pipeline.

The Applicant has proposed a designation condition requiring that works “*do not adversely impact on the ongoing safe and efficient operation of Network Utility Operation*” and Watercare have sought conditions to specifically protect their interests and require ongoing consultation.

Given the overall low risk of settlement, I agree that this matter can be covered by the

conditions.

Dando Family Trust (JS9)

From my reading of the submission, I understand that the primary groundwater concern is the potential for impact on their 160 m deep groundwater bore. The submitter has requested a condition requiring monitoring but is not explicit if this is related to quantity, groundwater level or quality.

The Hydrogeology Assessment report does not identify all bore owners, however I have assumed the submitter's bore is BH29265, as shown on the groundwater drawing set. The Hydrogeology Assessment report suggests there is no active consent for this well and so the use and rate of take are not known; if there is no consent than I have presumed that any lawful take is provided for as a permitted activity or directly by s14(3)(b).

The bore is located ~300 m from the cut at Ch47400 to Ch47800, and, ~600 m from the cuts at Ch46150 to Ch46500. These cuts are not specifically identified in the groundwater report but based on the long section they are above the groundwater level which is inferred to be at ~46 mRL and ~64 mRL, respectively. However, there is no project specific monitoring of groundwater levels near these cuts to verify these levels and there remains some risk that the groundwater level may be above the indicative design level and therefore some drawdown at the cuts might occur (contrary to what is indicated on the long section).

Regardless, based on the reported bore depth and distance from the cuts, I consider the Applicant's general statement that bore effects are not expected is a reasonable statement for this site.

As described earlier, I am recommending a consent condition requiring a bore survey of any properties within the zone of calculated drawdown. The outcome of this survey would be to identify potentially affected wells and to confirm if monitoring is required.

5.0 CONDITIONS

I have reviewed the proposed conditions and note that no groundwater conditions were provided. I recommend the following groundwater specific conditions are included in the regional consent condition set:

Condition 1: Updated Assessment of Drawdown

At least twenty (20) working days prior to the commencement of dewatering, the Consent Holder must provide an updated Hydrogeological Assessment based on the Detailed Design to confirm that the potential effects arising from drawdown remain within the envelope considered at the time of consenting and to confirm if monitoring of any specific areas is warranted.

Condition 2: Damage Avoidance

All excavation, dewatering systems and works associated with the taking and diversion of groundwater shall be designed, constructed and maintained so as to avoid Damage to buildings, structures and Services, or impacts on lawful groundwater or surface water takes, outside that considered as part of the application process unless otherwise agreed in writing with the asset owner.

Purpose: These first two conditions provide the performance standard against which any design changes need to be considered. In the absence of a detailed design with which to fix excavation locations or levels, this enables confidence in the overall “less than minor” effects conclusion and subsequent agreement that monitoring is not required.

Condition 3: Bore survey

At least 3 months prior to the commencement of activities authorised by this consent, the Consent Holder shall undertake a bore survey (including but not limited to location, depth, pump type and groundwater level, where accessible) of all properties within the calculated extent of drawdown as per the updated assessment required by Condition 1. The survey shall determine if any bores in existence at the date this consent was granted, are likely to be materially affected by drawdown effects from the Project.

The bore assessment process shall be set out in the updated Hydrogeological Assessment required by Condition 1 and shall include recommendations as to any specific measures to avoid, mitigate or remedy effects beyond that considered at the time of consenting. This shall include recommendations for any monitoring.

Purpose: The assessment of effects is based on a 2017 bore database and an indicative alignment which might change. It is possible that new bores have been installed since that time, or that there are older historic bores not on the database. A bore survey is a practical means of determining if there is any residual risk once the final alignment is determined.

Condition 4: Settlement

At least 3 months prior to the commencement of activities authorised by this consent, the Consent Holder shall undertake a risk assessment to identify buildings, structures and utilities in existence at the date this consent was granted, that are at-risk of damage due to settlement caused by the project works.

The risk assessment process shall be set out in the updated Hydrogeological Assessment required by Condition 1 and shall be based upon the final road alignment and construction methodology. The assessment shall include recommendations for any specific measures to

avoid, mitigate or remedy effects beyond that considered at the time of consenting. This shall include recommendations for any pre-, during or post-construction conditions surveys or other monitoring.

***Purpose:** The assessment of effects is based on an indicative alignment which might change. The assessment of settlement risk should be updated once the final alignment is determined.*

Condition 5: Settlement Contingency Actions

If the Consent Holder becomes aware of any Damage to buildings, structures or Services potentially caused wholly, or in part, by the exercise of this consent, the Consent Holder shall:

- (a) Notify the Team Leader - Compliance Monitoring and the asset owner within two working days of the Consent Holder becoming aware of the Damage.
- (b) Provide a report prepared by a SQEP (engaged by the Consent Holder at their cost) that describes the Damage; identifies the cause of the Damage; identifies methods to remedy and/or mitigate the Damage that has been caused; identifies the potential for further Damage to occur, and, describes actions that will be taken to avoid further Damage.
- (c) Provide a copy of the report prepared under (b) above, to the Team Leader Compliance Monitoring Central and the asset owner within 10 working days of notification under (a) above.

***Advice Note:** It is anticipated the Consent Holder will seek the permission of the damaged / affected asset owner to access the property and asset to enable the inspection/investigation. It is understood that if access is denied the report will be of limited extent.*

Condition 6: Bore Interference Contingency Actions

The consent holder shall investigate, report on, and remedy as necessary/if appropriate interference effects caused by the exercise of this consent on a lawful water taker (at the time this consent determined).

- (a) Within ten working days of a request to investigate and report on a claim of interference effects the Consent Holder shall report to the Council and Claimant on their investigation of the claimed interference.
- (b) The investigation shall be by an appropriately qualified person and the report shall clearly identify whether the exercise of this consent more likely than not is the cause of the reported

interference effect, including identifying what the investigation included to determine the conclusion; what action is proposed to remedy the matter, if any; the proposed timeframe for remedying the matter, if remedial action is necessary.

- (c) Should the Claimant's loss of the ability to lawfully abstract water be the result of interference effects caused by the exercise of this consent the Consent Holder shall reimburse the lawful water taker for the reasonable ordinary commercial costs of alternative water supply for that period the exercise of this consent prevented/prevents the lawful water taker from abstracting groundwater in accordance with the authority for their water take. And, the Claimant's reasonable ordinary commercial costs of demonstrating the Consent Holder be required to investigate and report on the alleged interference effect (see below Advice Note), all within ten working days of receiving receipt from the affected lawful water taker.
7. Condition 6 shall not apply where the Claimant and the Consent Holder have reached an alternative agreement such that the Claimant agrees to no longer having the benefit of Condition 6.
8. The obligations in Condition 6 which require the Consent Holder to take action which involves access to a third party's property (bore, information etc) and where the Consent Holder has made a reasonable attempt to obtain that access but access is denied or the third party has not responded to the Consent Holder's request/s within ten working days then, provided the Consent Holder has provided evidence of the denial or non-response to the satisfaction of Council, the Consent Holder does not need to take that action in order to comply with the conditions of this consent.

Advice Notes:

- i) The Council shall advise the consent holder of any claim it receives of interference effects.
- ii) The Council will request the Consent Holder to investigate and report on a claim of interference effects if it is satisfied the claim should be investigated by the Consent Holder.
- iii) It is expected the Council will review any complete claim and decide whether to request action by the Consent Holder within three working days.
- iv) The claim needs:

- a. To be by a lawful water taker (at the time this consent was determined).
- b. Describe the alleged interference effect.
- c. Include confirmation from a suitably qualified and experienced person/party that the Claimant's bore and pump are otherwise in good working order, and that lowering the pump (or pump intake) or deepening their bore is not a feasible option (*refer AUP Policy E2.3(7)(f)*)
- d. Confirm that reasonable access will be provided, to a suitably qualified and experienced hydrogeological professional engaged by the consent holder, to their bore and any pump, water take records and other relevant information for the purposes of investigating the bore interference claim.
- v) It is anticipated the Consent Holder will have sought, and incorporated as considered reasonable, the Claimant's input and agreement on remedial action/s, if such are necessary.
- vi) The potential costs specified in Condition 6 c) above does not extend to other costs such as but not limited to replacing a pump, replacing a pump with a different type of pump, re-casing a bore, deepening a bore, grouting or re-grouting a bore.

Purpose: Conditions 5 to 8 are contingency conditions, only relevant if there is claims of damage or effect. The conditions provide that if there is damage / impact to a third-party asset (that it seems likely the Consent Holders activity has caused) then further damage should be avoided, and the consent holder should meet those identification / investigation costs.

Whilst damage is not expected there is always some inherent uncertainties e.g. preferential drawdown extending further than anticipated and resulting in settlement or other effects not able to be identified at the time of consenting.

6.0 RECOMMENDATION

The assessment in this memo does not identify any reasons to withhold consent, and the aspect of the proposal considered by this memo could be granted consent, subject to recommended conditions, for the following reason:

- Subject to the imposition of consent conditions, it is considered that the

adverse effects on groundwater are likely to be less than minor.

7.0 REVIEW

Memo prepared by:

Sian France

Technical Director – Hydrogeology, Beca Ltd

Date:

20 August 2020

Reviewed and approved for release by:

Andrew Benson

Team Leader - Coastal and Water Allocation, Specialist Unit, Resource Consents

Date:

21 August 2020

ATTACHMENT 4
QUALIFICATIONS AND/OR EXPERIENCE

Nicola Holmes	<ol style="list-style-type: none"> 1. My full name is Nicola Jane Holmes. I am employed as a Principal Specialist – Planning, within the Resource Consents department at Auckland Council. 2. I currently process resource consents, resolve objections, manage appeals to the Environment Court, determine resource consent applications, and provide advice and mentoring to planners within the Resource Consents department. 3. I hold the qualifications of Masters of Social Science with a major in Geography and Resources and Environment Planning, from the University of Waikato. 4. I have 16 years' experience as a planning professional both in the United Kingdom and New Zealand. My experience has predominantly been within the regulatory framework of planning, including roles as a processing planner, compliance officer and Team Leader. For the past 8 years I have largely been involved in rural, urban, infrastructure and coastal developments located in the north-west of the Auckland region.
Matthew Byrnes	<ol style="list-style-type: none"> 1. My full name is Matthew Charles Byrne and I am a director of Babington & Associates (2004) Limited, an environmental consultancy that specialises in environmental management, including erosion and sediment control, civil and environmental engineering design and implementation. 2. I am contracted to the Auckland Council's Earth, Streams and Trees Team, Specialist Input Unit, Resource Consent, as an Earthworks, Streamworks & Sediment Management Specialist. I have held this position for the past ten years. Prior to that, from July 2004, I was employed by both the legacy Auckland Regional Council and the current Auckland Council in a similar role, undertaking processing and compliance monitoring of regional earthworks and streamworks consents. 3. I hold the qualifications of Bachelor of Environmental Studies from the University of Waterloo, Ontario, Canada. 4. I have over 25 years' experience in the field of environmental protection including 9 years' experience as a contaminated land consultant and over 16 years' experience as an erosion and sediment control and streamworks management consultant.
Mark Lowe	<ol style="list-style-type: none"> 1. My full name is Mark Ian Lowe. I am a Principal Environmental Scientist at Morphem Environmental Limited (Morphum). I have worked at Morphem since May 2013. 2. I am a consultant to Auckland Council providing specialist input to resource consent processing on matters of

	<p>streamworks, freshwater ecology, terrestrial ecology and vegetation removal, and biodiversity offsetting.</p> <ol style="list-style-type: none"> 3. I hold the qualifications of Bachelor of Science (Ecology) and Masters in Science (Conservation Biology) from Massey University. 4. I am a Certified Environmental Practitioner (CEnvP) and have completed the 'Making Good Decisions Course'. 5. I have 13 years' experience as a professional ecologist and environmental scientist. My work experience includes undertaking ecological assessments; preparing and peer reviewing Ecological Impact Assessments and Ecological Restoration Plans; providing technical advice to support district and regional plan changes; the development of non-statutory guidance documents and practice notes; the development of technical ecological tools to support ecological assessments and management decisions; and, providing strategic advice for district and regional councils on ecological and stormwater matters.
Paul Crimmins	<ol style="list-style-type: none"> 1. My full name is Paul Edward Crimmins and I am employed as a Senior Specialist within the Contamination, Air & Noise Team of Auckland Council's Specialist Unit at Graham Street, Auckland Central. 2. I have been employed in this role since a restructure in October 2017 and in a similar Senior Specialist role since February 2013. Prior to this I was employed as a Consents and Compliance Advisor by Auckland Council and as an Environmental Scientist with Beca Limited. I have over ten years' experience in air quality assessments (human health and amenity effects). 3. I hold a Master of Science (First Class Honours) in Environmental Science from the University of Auckland (2018), and a BSc (Environmental Science) and BA (Politics) from the University of Auckland (2009). I am a member of the Clean Air Society of Auckland and New Zealand (CASANZ). 4. I have been involved with consenting and compliance for numerous air discharge permits throughout the Auckland Region over the past decade. Some examples include: <ul style="list-style-type: none"> • Industrial air discharges (including NZ Steel, Pacific Steel, O-I Glass, Winstone Wallboards, Tasman Insulation, Southdown Power Station, Industrial Processors, numerous asphalt plants); • Construction projects (including City Rail Link, America's Cup Wynyard Quarter works, Waterview

	<p>Tunnel, Northern Expressway Extensions, East-West Link);</p> <ul style="list-style-type: none"> • Waste facilities (including Whitford Landfill, Redvale Landfill; Mangere Wastewater Treatment Plant and biosolids fill; hazardous waste treatment facilities at Neales Rd, Miami Pde and Stonedon Dr; numerous refuse transfer stations).
<p>Kalayarasi Sivaguru</p>	<ol style="list-style-type: none"> 1. My name is Kalayarasi (Kala) Sivaguru. I hold MSc (Hons) in Marine Ecology and Ph.D in Marine Ecology and Ecotoxicology from the University of Auckland. I am currently employed as a Senior Coastal Specialist in the Specialist Unit at the Council. I have been working in this Specialist Unit since March 2013. 2. Prior to this, I worked for the Department of Conservation for 11 years where I provided advice on the conservation and management of the ecology of the marine environment in the Auckland region. During this role, I have undertaken long term research and monitoring programmes in marine reserves across Auckland Region. 3. I am a member of New Zealand Marine Sciences Society. 4. In my current role, I have been involved in assessing marine ecological effects of a number of regionally significant projects. 5. My recent experience of particular relevance to this proposal includes: <ul style="list-style-type: none"> • Assessed the effects of dredging for a number of applications (Hobsonville Marina (Limeburner's Bay), Buckland Beach Yacht Club, West harbour Marina, Gulf Harbour marina (in progress)) • Assessed the effects on marine ecology and seabirds (blue penguins in particular) of the marina proposals at Matiatia and Kennedy Point, Waiheke; • Assessed the effects on marine ecology, water and sediment quality in relation to AC36, Sealink & Ferry Terminal relocations, Queens Wharf upgrade, Seawall upgrades along Quay Street, Down Town Public Space project, Half Moon Bay and Westhaven Marina extensions. • Assessed the marine ecological effects of wastewater discharges to the receiving environment at Martins Bay from Snells Wastewater Treatment Plant (WWTP) and Clarks Beach from the South-west Subregional WWTP, St Mary's and Masefield beach discharge effects on marine environment; • Assessed the marine ecological effects from the East West Link project including dredging effects; • Assessed the marine ecological effects from a number of proposed large scale mussel farming

	<p>applications, For example mussel farm applications in the Firth of Thames (470 ha) by the Western Consortium and Westpac mussel limited (128 and 171 ha) and Ponui mussel farm application (128ha);</p> <ul style="list-style-type: none"> • Assessed the marine ecological effects from a number of applications related to coastal infrastructure, washwater (from boat cleaning & repairs) discharges and mangrove removal. • Assessed the effects from mangrove removal for a number of projects (clearance up to 76ha in Waiuku). • Assessing the ecological effects from two sand extraction applications (near shore and off shore along Pakiri-Mangawhai) • I have assessed a number of applications in relation to underwater noise effects on marine mammals in particular. This includes acoustic and marine ecological effects.
Abhilasha (Abby) Sharma	<ol style="list-style-type: none"> 1. My full name is Abhilasha Sharma. I am a Senior Specialist in the Resource Consents Department at Auckland Council. I have worked in the Resource Consents Department since April 2012. 2. I provide specialist input to resource consent processing on matters of stormwater quality and management, and discharge of contaminants from an Industrial & Trade Activity (ITA). 3. I hold the qualifications of Bachelor of Science (Botany) from Otago University, Postgraduation Diploma (Biological Science) from University of Auckland and Masters in Science (Biological Science) from Waikato University. 4. I have 4 years' experience as a stormwater and ITA consents compliance officer and 5 years' experience as specialist providing technical input in the consenting process for Auckland Council. My work experience includes undertaking site visits for monitoring compliance of resource consents conditions; reviewing all relevant information on the submitted site specific technical reports and management plans and providing comments to external and internal customers; providing technical advice to support regional plan changes within the AUP(OP); providing input for non-statutory guidance documents and practice notes; and, providing strategic advice for complex projects on stormwater and ITA matters.
Trent Sunich	<ol style="list-style-type: none"> 1. My full name is Trent David Sunich. I am a Senior Environmental Consultant at 4Sight Consulting Limited (4Sight). I hold a Bachelor of Technology (Environmental) which I obtained from the Unitec Institute of Technology in 2001. I have been employed by 4Sight as Senior Environmental Consultant since August 2012.

	<ol style="list-style-type: none"> 2. I am a consultant to the Auckland Council's Healthy Waters department where my role is in catchment management planning, assessment of new development proposals and assistance with administering compliance with the network consents held by the department. I assisted Healthy Waters is obtaining the Regionwide Stormwater Network Discharge consent and also represented the department in the Board of Enquiry hearing for the East West Link. 3. I have also assisted the Auckland Council Specialist Input providing technical assessment for a range of stormwater applications including subdivisions, industrial and trade activities discharges and new roads (e.g. Auckland Transport Peninsula Link) and large scale rural industry proposals. 4. I have approximately 19 years' experience in the field of natural resource planning and environmental engineering. My expertise is in stormwater quality and quantity management, integrated catchment management planning, and industrial site auditing and contaminant management where I have held roles with the Auckland Regional Council and URS New Zealand Limited. 5. I confirm that I have visited the site and have familiarised myself with the critical areas of the project.
Sian France	<ol style="list-style-type: none"> 1. My full name is Sian Julia France. I am a Technical Director - Hydrogeology at Beca Ltd. I have worked at Beca since 2003. 2. I am a consultant to Auckland Council providing specialist input to resource consent processing on matters relating to groundwater take and diversion since 2015. 3. I hold the qualifications of Bachelor of Science and Masters of Science (1st Class Honours) in geology from the University of Auckland. 4. I have 17 years' experience as a professional hydrogeologist. My work experience has included a wide range of projects such as groundwater wells for municipal and industrial supply, land based disposal of stormwater and wastewater, and over the last 10 years with a particular focus on the environmental impacts of groundwater diversion due to large infrastructure projects. I have lead the groundwater inputs on construction projects such as Waterview Connection, Waikato Expressway - Hamilton Section and Central Interceptor where my tasks included the calculation of the magnitude and extent of groundwater drawdown to assess environmental effects, confirm consent conditions can be met, and provide inputs to engineering design and construction decisions.

ATTACHMENT 6

**COPIES OF DECISIONS RELATED TO
BUN60330590 AND LUC60309679**

Notification and substantive report for an application for resource consent under the Resource Management Act 1991



Non-complying activity

1. Application description

Application numbers:	BUN60330590 WAT60330596 LUC60330594 LUS60331447 CST60342608
Applicant:	Watercare Services Limited
Site address(s):	See Appendix A
Legal description(s):	See Appendix A
Site area:	N/A
Auckland Unitary Plan (Operative in part)	
Zoning and precinct:	Open Space – Informal Recreation Zone Open Space – Conservation Zone Business – Mixed Use Zone Future Urban Zone Road Rural – Mixed Rural Zone Residential – Single House Zone Business Local Centre Zone Rural – Rural Coastal Zone Rural – Countryside Living Zone Coastal – Coastal Transition Zone
Overlays, controls, special features, designations, etc:	Overlays: Outstanding Natural Landscape (Area 43 West Mahurangi Harbour) Overlays: Significant Ecological Area – Terrestrial (3738, 6684,3731) Overlays: High Natural Character (Area 58 Mahurangi River Southern Escarpment) Overlays: Natural Stream Management Area Overlays: High Use Aquifer Management Area (Mahurangi Waitemata) Overlay: Quarry Buffer Area Overlays: Significant Ecological Area – Marine 1 (M1-76b)

Locality Plan

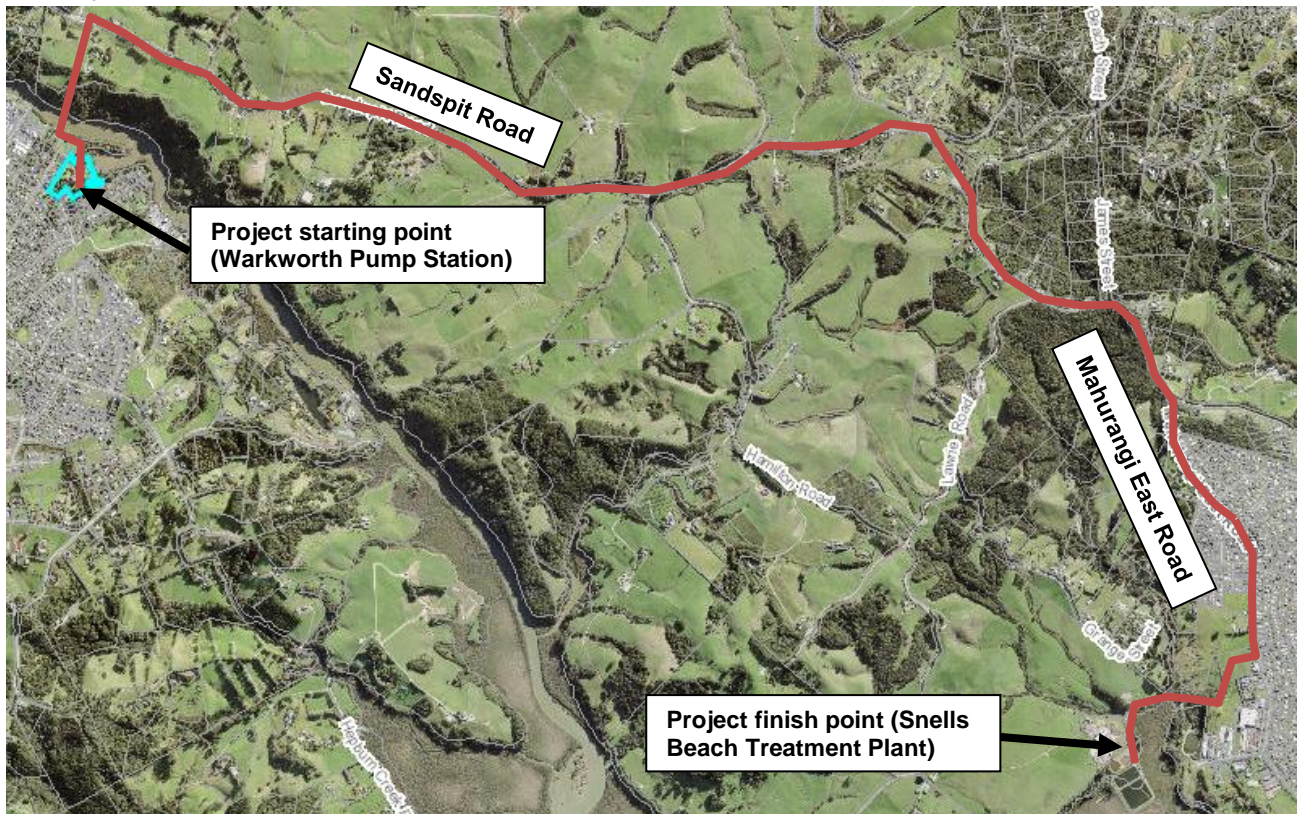


Figure 1: Aerial map showing approximate extent of pipeline

Application documents (plans and reference documents)

The following information has been provided:

- Application Form, and Assessment of Effects prepared by Megan Couture of Beca, dated 15 November 2018.

Report title and reference	Author	Rev	Dated
Ecological Assessment – North East Conveyance and Snells Beach WWTP	Beca	B	24/09/2018
Arboriculture Assessment NE Wastewater Conveyance, Warkworth to Snells WWTP Transfer Pipeline	Greenscene NZ	-	14/11/2018
North East Conveyance – Warkworth to Snells Beach WWTP Geotechnical Interpretative Report	Tonkin & Taylor	3	November 2018
North East Conveyance – Warkworth to Snells Beach Transfer Pipeline Groundwater Technical Assessment Report	Tonkin & Taylor	4	November 2018
NE Wastewater Conveyance Scheme – Assessment of Acoustic Effects	Marshall Day Acoustics	-	26/10/2018

Drawing title and reference	Author	Rev	Dated
2012971.002 Locality Plan	Watercare	2	10/09/2018
2012971.003 Plan and Longitudinal Section: Rising Main – CH 100 to 300 - Sheet 1	Watercare	2	10/09/2018
2012971.004 Plan and Longitudinal Section: Rising Main – CH 300 to 600 - Sheet 2	Watercare	2	10/09/2018
2012971.005 Plan: Rising Main – CH 600 to 900 - Sheet 3A	Watercare	2	10/09/2018
2012971.006 Longitudinal Section: Rising Main – CH 600 to 900 - Sheet 3B	Watercare	2	10/09/2018
2012971.007 Plan and Longitudinal Section: Rising Main – CH 900 to 1200 - Sheet 4	Watercare	2	10/09/2018
2012971.008 Plan and Longitudinal Section: Rising Main – CH 1200 to 1500 - Sheet 5	Watercare	2	10/09/2018
2012971.010 Plan and Longitudinal Section: Rising Main – CH 1800 to 2100 - Sheet 7	Watercare	2	10/09/2018
2012971.011 Plan and Longitudinal Section: Rising Main – CH 2100 to 2400 - Sheet 8	Watercare	2	10/09/2018
2012971.012 Plan and Longitudinal Section: Rising Main – CH 2400 to 2700 - Sheet 9	Watercare	2	10/09/2018
2012971.013 Plan and Longitudinal Section: Rising Main – CH 2700 to 3000 - Sheet 10	Watercare	2	10/09/2018
2012971.014 Plan and Longitudinal Section: Rising Main – CH 3000 to 3300 - Sheet 11	Watercare	2	10/09/2018
2012971.015 Plan and Longitudinal Section: Rising Main – CH 3300 to 3600 - Sheet 12	Watercare	2	10/09/2018
2012971.016 Plan and Longitudinal Section: Rising Main – CH 3600 to 3900 - Sheet 13	Watercare	2	10/09/2018
2012971.017 Plan and Longitudinal Section: Rising Main – CH 3900 to 4200 - Sheet 14	Watercare	2	10/09/2018
2012971.018 Plan and Longitudinal Section: Rising Main – CH 4200 to 4500 - Sheet 15	Watercare	2	10/09/2018
2012971.019 Plan and Longitudinal Section: Rising Main – CH 4500 to 4800 - Sheet 16	Watercare	2	10/09/2018
2012971.020 Plan and Longitudinal Section: Rising Main – CH 4800 to 5100 - Sheet 17	Watercare	2	10/09/2018
2012971.021 Plan and Longitudinal Section: Rising Main – CH 5100 to 5400 - Sheet 18	Watercare	2	10/09/2018
3254607-LA-001 Warkworth to Snells Transfer Pipeline Hamatana Road Ecological Planting	Watercare	A	10/04/2019
3254607-LA-001 Warkworth to Snells Transfer Pipeline Hamatana Road Ecological Planting [planting schedule]	Watercare	A	10/04/2019

Other additional information	Author	Rev	Dated
Ecological Assessment of Western Culvert Upgrade for NE WW Conveyance Works – supplementary	Beca	2	21/02/2019
NE Conveyance – Snells Beach WWTP access road – Weed Control Plan	Beca	3	18/04/2019
Response to request for further information under section 92 of the Resource Management Act 1991 (BUN60330590, LUS60331447, WAT60330596, LUC60330594)	Beca	-	27/02/2019
Vegetation Clearance Detail	Beca	-	27/02/2019
North-East Wastewater Conveyance Works – Supplementary Assessment of Effects on the Environment associated with the installation of culverts	Beca	-	27/02/2019
Tree Asset Owner Approval – Application Form	Auckland Council (Community Facilities)		05/11/2018
North East Wastewater Conveyance Streamworks Assessment of Effect on the Environment	Beca	2	16/07/2019
Response to request for further information under section 92 of the Resource Management Act 1991 (BUN60330590, LUS60331447, WAT60330596, LUC60330594)	Beca	-	16/05/2019
Response to request for further information under section 92 of the Resource Management Act 1991 (BUN60330590, LUS60331447, WAT60330596, LUC60330594)	Beca	-	18/04/2019

The information has been reviewed and assessed by the following specialists:

- Samantha Sutherland, Ecologist – ecology matters
- Samuel Holmes, Senior Regulatory Engineer - district earthworks and natural hazards
- Fiona Harte, Specialist, Earthworks & Streamworks – streamworks and regional earthworks
- Gavin Donaldson, Senior Arborist – tree removal and alteration
- Pat Shorten, Geotechnical Engineer (consultant) – groundwater take and diversion
- Lindsay Leitch, Acoustic Engineer (consultant) – noise and vibration

2. The proposal, site and locality description

Proposal

The proposal is for the construction and operation of an 8km long wastewater conveyance pipeline. The pipeline will transfer wastewater flows via 3 new pump stations from Warkworth to

the new Snells Beach Sub-Regional Wastewater Treatment Plant (WWTP). Consent is required for construction related activities, which relate to the installation of the pipeline, as well as upgrades to the existing access road to the Snells Beach WWTP.

These works include:

- Removal of up to 17 protected trees within Lucy Moore Memorial Park and up to 5 protected trees on road reserve
- Alteration/trimming of 9 trees within Lucy Moore Memorial Park
- Earthworks of approximately 30,610m³ over a total area of approximately 17,340m²
- Removal of approximately 2180m² of vegetation within the Significant Ecological Area Overlays
- Removal of approximately 780m² of riparian vegetation
- Reclamation of approximately 922m² m of mangrove forest
- Reclamation of 110m of intermittent stream
- Replacement and upgrades to culverts beneath the existing access road

Additional components of the project (not requiring consent) include:

- The installation of a break pressure chamber
- Odour treatment facilities
- Decommissioning of the pipeline between Alnwick Street and the Warkworth WWTP
- Decommissioning of the Lilburn Street Pump Station

A description of works for each geographical section is outlined below:

Warkworth Street Pump Station (DPWWS) to Sandspit 1 Pump Station (DPSA1)

In this area, the twin 400mm rising mains will be installed from a new pump station (DPWWS) adjacent to the existing Lilburn Street Pump Station, to the second pump station (DPSA1) on Sandspit Road. The pipeline will largely be installed by trenched methods within the park, up until the high ground adjacent to the Baxter Street carpark, where there will be trenchless methods used to install pipeline up to Baxter Street. From Baxter Street the pipeline will be installed beneath the Mahurangi River by trenchless methods again, crossing through 198 Sandspit Road to the new DPSA1 at 265 Sandspit Road.

Works requiring consent in this area include:

- Removal of approximately 17 trees within Lucy Moore Memorial Park
- Trimming of approximately 9 trees within Lucy Moore Memorial Park
- Potential decommissioning of the existing bore and replacement of the bore at 198 Sandspit Road
- Approximately 6680m³ of earthworks over 1200m² for the construction of DPWWS
- Approximately 5240m³ of earthworks over 4100m² for the construction of DPSA1
- Reclamation of 110m of intermittent stream

Construction of each pump station is expected to take between 12-18 months. Works within the park to lay the pipeline are expected to take between 3 and 6 months, and 10 to 12 months being required for the trenchless crossing.

DPSA1 to Sandspit 2 Pump Station (DPSA2)

From the DPSA1, the conveyance pipeline will be installed by way of open trenching within the road reserve from 265 to 513A Sandspit Road, the location of the third pump station.

Works requiring consent in this area include:

- Removal of 7 trees (willow and totara) within the road reserve
- Approximately 9240m³ of earthworks over an area of 3500m² for the construction of DPSA2

The expected timeframe for the construction of DPSA2 is between 12-18 months.

DPSA2 to Break Pressure Chamber (Mahurangi East Road)

From DPSA2 the pipeline will be installed by open trenching within Sandspit Road and Mahurangi East Road for approximately 3.5km to the break pressure chamber located adjacent to 34 Mahurangi East Road. From here, the pipeline will change to a single 800mm gravity main.

Works in this area requiring consent include:

- Potential removal of 1 tree (subject to consultation with AC Parks upon final design)

The expected duration of these works is between 12 to 15 months.

Break Pressure Chamber to Snells Beach WWTP

From the break pressure chamber the pipeline follows Mahurangi East Road to the south, until 200 Mahurangi East Road where it turns to the west and to the south. The pipeline briefly crosses the rear of 254-268 Mahurangi East Road, before following the existing private access road, and connecting to the Snells Beach WWTP. Again, trenched methods of pipe installation will be used for the sections within the road and on private land. The private access road at the end of Hamatana Road will be re-aligned and widened to facilitate the construction of the pipeline and future proof the road for heavy vehicle movements from the treatment facility.

Works in this area requiring consent include:

- Installation of two new sets of culverts (total of 4)
- Removal of mangroves, riparian vegetation and vegetation within the SEA overlay
- Approximately 10,750m³ of earthworks over an area of 8540m²

The expected duration of these works is between 12 to 18 months.

Site and surrounding environment description

In Warkworth, the project begins in Lucy Moore Memorial Park, a local park located adjacent to the Mahurangi River, in between the town centre and established residential development. The park is largely gassed with a number of established exotic trees. To the north of the park, the project runs beneath the Mahurangi River and Puhunui Scenic Reserve, which are considered to be of High Natural Character and an Outstanding Natural Landscape. This reserve is not accessible to the public, but does provide a scenic backdrop of native forest to the Warkworth township.

As the pipeline reaches Sandspit Road, the environment is a relatively open rural landscape, which is characterised by large pastoral farming lots. Further to the east and at the beginning of

Mahurangi East Road, the surrounding sites transition to smaller, rural lifestyle lots with significant bush cover. Mahurangi East Road is the main route providing access between the townships on the Mahurangi Peninsula and the rest of the Auckland region.

As the project gets into Snells Beach, the area becomes dominated by medium density residential development within a coastal township. The pipeline avoids much of this development, crossing through another rural site, and following an unnamed tributary of the Mahurangi River, up to the private access road at the end of Hamatana Road. This access road follows the mouth of the stream and crosses over a historic reclamation. In this area, the vegetation is comprised of estuarine and riparian plant species, as well as pines and some pasture. Adjacent to the WWTP is rural farmland and a timber processing yard.

Background

Consent was granted in 2017 for the following activities:

- Construction and maintenance of three wastewater network pump stations
- Construction of a new wastewater outfall and associated discharge in Martins Bay
- Discharge to land for wastewater overflows from one pump station outside of the urban area
- Air discharges from the Warkworth and Snells WWTP
- Construction activities related to the new outfall

These consents are referenced as LAN-67900, REG-67901, REG-67903, REG-67905, REG-67908, REG-67909, REG-67911, REG-67912, REG-67915, REG-67916, LAN-67917 and REG-67918.



Figure 2: Lucy Moore Memorial Park looking north over an open area in the general direction of the pipeline alignment between Chainage 200 and 300.



Figure 3: View looking south within Lucy Moore Memorial Park towards existing pump station (DPWWS) and trees scheduled for removal (T35 and T36).



Figure 4: Existing Lilburn St pump station and location of new DPWWS



Figure 5: Car parking on Baxter Street showing location of flushing chamber (red) and launch location for trenchless river crossing.



Figure 6: Looking north over Mahurangi River in approximate location of trenchless river crossing. Puhinui Scenic Reserve in background.



Figure 7: Existing WWTP access road looking east over eastern culvert.



Figure 8: View from existing WWTP access road looking south towards coastal marine area. Existing roadside vegetation and mangrove forest visible in foreground.



Figure 9: View of stream feeding into western culvert

3. Reasons for the application

Land use consents (s9) – LUC60330594

Auckland Unitary Plan (Operative in part)

Taking, using, damming and diversion of water and drilling

- To undertake diversion and dewatering of groundwater caused by excavation that doesn't comply with the permitted activity standards, as a **restricted discretionary activity** under E7.4.1(A20) and (A28).
The works will involve dewatering over more than 30 days, will extend below groundwater level and more than 6m below ground level and will physically impede the flow of groundwater over a length of more than 20m and extend more than 2m below the natural groundwater level.
- To replace an existing bore which does not meet the permitted activity standards as a **restricted discretionary activity** under E7.4.1(A42).

Dependent on the final alignment of the wastewater conveyance pipeline, an existing bore within 198 Sandspit Road may require decommissioning and replacement. The new bore location may not be able to be within 10m of the existing bore.

Infrastructure

- To undertake vegetation removal within the SEA overlay that does not comply with Standards E26.3.5.1 to E26.3.5.4 as a **restricted discretionary activity** under E26.3.3.1(A77).
The proposal will require minor pruning and removal of 1400m² of vegetation within the SEA_T_3731 overlay and removal of 780m² of riparian vegetation within the SEA. 564m² of vegetation removal is required around the western most culvert. The vegetation removal is required to widen the existing WWTP access road located at the end of Hamatana Road.
- To undertake tree trimming and pruning that does not comply with Standard E26.4.5.1 as a **restricted discretionary activity** under E26.4.3.1(A84).
The proposal requires pruning of approximately 9 trees within Lucy Memorial Park that will not comply with the standards.
- To undertake works within the protected root zone not otherwise provided for as a **restricted discretionary activity** under E26.4.3.1(A88).
The proposal will require excavation within the protected root zone of several trees within Lucy Moore Memorial Park and Sandspit Road.
- To remove trees greater than 4m in height and/or 400mm in girth as a **restricted discretionary activity** under E26.4.3.1(A92).
The proposal requires the removal of approximately 15 trees within Lucy Moore Memorial Park and one tree within the road reserve (Sandspit Road). Dependent on the final design, a further two trees within the park and adjacent to the outlet may be required for removal, and approximately four trees within the road reserve adjacent to 265 Sandspit Road (consent is sought for these removals also).
- To undertake more than 2500m² and more than 2500m³ of earthworks within the Rural Countryside Living Zone as a **restricted discretionary activity** under E26.5.3.1(A97) and (A97A).
The proposal will require 10,750m³ of works over an area of 8540m².
- To undertake more than 2500m² of earthworks where the land has a slope equal to or greater than 10 degrees as a **restricted discretionary activity** under E26.5.3.2(A106).
Approximately 7600 m² of earthworks are proposed at DPSA1 and DPSA2 on land with a slope of greater than 10 degrees.
- To undertake more than 2500m² of earthworks in a sediment control protection area as a **restricted discretionary activity** under E26.5.3.2(A107).
Approximately 4100 m² of earthworks are proposed at DPSA1 which is within the sediment control protection area.

- To undertake earthworks from 10m² to 2500m² and from 5m³ to 2500m³ within the High Natural Character Overlay and Outstanding Natural Landscapes Overlay as a **restricted discretionary activity** under E26.6.3.1(A117).
Earthworks may be required for an intermediate shaft site if pipe jacking is chosen as the method for crossing beneath the Mahurangi River, and will be located within the grassed area of 198 Sandspit Road.
- To undertake earthworks which are a restricted discretionary, and do not comply with the relevant standards under E26.5.5.2, as a **restricted discretionary activity** under C1.9(2).
The proposed earthworks include filling within a 1% AEP floodplain of more than 10m³ at DP1SA1 and at the private access road, and more than 10m² of earthworks within the riparian and coastal protection yards which relate to the installation of new network utilities (pipeline and pump stations).

Natural Hazards and Flooding

- To construct the new pipeline within the 1% AEP floodplain as a **restricted discretionary activity** under E36.4.1(A56).
The proposed pipeline will be located within the 1% AEP floodplain within Lucy Moore Memorial Park, at several spots along Sandspit Road and at Hamatana Road.

Noise and Vibration

- To undertake construction activities which do not comply with the permitted activity standards, as **restricted discretionary activity** under E25.4.1(A2).
Some construction activities associated with both trenchless and trenched pipeline installation will exceed the 70dB limits for works within the road and within 30m of unscreened residential receivers.

Stream works consent (s13) – LUS60331447

- To undertake mangrove removal which is not otherwise provided for, within the SEA overlay as a **discretionary activity** under E3.4.1(A17).
The proposal will require the removal of approximately 1000m² of mangrove and scrubs on the northern side of the access road and approximately 730m² of mangrove and scrub on the southern side of the access road.
- To replace an existing culvert which is located within the SEA overlay which complies with E3.6.1.12 as a **restricted discretionary activity** under E3.4.1(A23).
The proposal will replace the existing culverts beneath the private access road.
- To install new culverts measuring less than 30m in length and located within the SEA overlay as a **discretionary activity** under E3.4.1(A32).
- To extend an existing lawful reclamation located in the SEA overlay as a **non-complying activity** under E3.4.1(A48).

The widening of the existing WWTP access road requires additional reclamation of approximately 1326m² adjacent to Culvert A and B, which are located in the SEA-T and SEA-M overlays.

- To undertake a new reclamation as a **non-complying activity** under E3.4.1(A49).
The earthworks required for the DPSA1 will result in reclamation of approximately 110m of intermittent stream.

Coastal Permit (s12) – CST60342608

- To undertake works which result in up to 1500m³ of sediment disturbance within in the same coastal cell, and within the SEA-M1 as a **discretionary activity** under F2.19.4(A33).
The proposed works will include approximately 159m³ of disturbance within the coastal marine area associated with the mangrove removal and installation of the new culverts for the upgrade of the private access road.
- To undertake native vegetation alteration or removal not otherwise provided for within the SEA-M1 overlay as a **non-complying activity** under F2.19.4(A42).
The proposal will require removal of approximately 730m² of native mangrove and scrub for the installation of the new culverts.
- To divert coastal water within the SEA-M1 overlay other than for the operational needs of vessels and firefighting as a **discretionary activity** under F2.19.6(A55).
The proposal will involve diversion of coastal water during the installation of the culverts by two cofferdams (installed and used one at a time) to allow for a dry area for works to occur.
- To use vehicles on the foreshore and seabed, within an SEA-M1 overlay, by network utility operators for the construction of new infrastructure as a **discretionary activity** under F2.19.8(A99).
Where possible, the installation of culverts and the cofferdams, associated with the road widening and pipeline installation, will be undertaken by a excavator and crane from the road, however a small excavator may be required to enter the foreshore and seabed area to removal material which cannot be reached from the road.

Consents applied for but not required

The applicant has applied to undertake more than 2500m² and 2500m³ of earthworks within an SEA Overlay as a **discretionary activity** under E26.6.3.1(A118). Upon further assessment, it is considered that consent under this rule is not required, as the total area of earthworks within the SEA overlay adjacent to the private access road is approximately 1400m².

4. Status of the applications

The resource consents required overlapped and are considered together as a **non-complying activity** status overall.

5. Public notification assessment (sections 95A, 95C-95D)

Section 95A specifies the steps the council is to follow to determine whether an application is to be publicly notified. These steps are addressed in the statutory order below.

Step 1: mandatory public notification in certain circumstances

No mandatory notification is required as:

- the applicant has not requested that the application is publicly notified (s95A(3)(a))
- there are no outstanding or refused requests for further information (s95C and s95A(3)(b)), and
- the application does not involve any exchange of recreation reserve land under s15AA of the Reserves Act 1977 (s95A(3)(c)).

Step 2: if not required by step 1, public notification precluded in certain circumstances

The application is not precluded from public notification as:

- the activities are not subject to a rule or national environmental standard (NES) which precludes public notification (s95A(5)(a)), and
- the application does not involve one or more of the following activities exclusively: a controlled activity; a restricted discretionary or discretionary activity for a residential activity (as defined in s95A of the RMA) or a subdivision; a boundary activity; or a prescribed activity (s95A(5)(b)).

Step 3: if not precluded by step 2, public notification required in certain circumstances

The application is not required to be publicly notified as the activities are not subject to any rule or a NES that requires public notification (s95A(8)(a)).

The following assessment addresses the adverse effects of the activity on the environment, as public notification is required if the activity will have or is likely to have adverse effects on the environment that are more than minor (s95A(8)(b)).

Adverse effects assessment (sections 95A(8)(b) and 95D)

Effects that must be disregarded

Effects on persons who are owners and occupiers of the land in, on or over which the application relates, or of land adjacent to that land

The council is to disregard any effects on the land in, on, or over which the activity will occur, and on persons who own or occupy any adjacent land (s95D(a)). A list of properties which are adjacent to the project corridor are included as **Appendix B** to this report.

Any effect on a person who has given written approval to the application

No persons have provided their written approval in regards to the application.

Effects that may be disregarded

Permitted baseline

The permitted baseline may be taken into account and the council has the discretion to disregard those effects (s95D(b)). There are a number of permitted activities which relate to the provision of wastewater infrastructure and the related works including:

- Pipes for the conveyance of wastewater under Rule E26.2.3.1(A9);
- Underground pipelines and ancillary structures (including above ground ancillary structures associated with underground pipelines) for the conveyance of wastewater under Rule E26.2.3.1(A49);
- Ventilation facilities, drop shafts and manholes under Rule E26.2.3.1(A57);
- Earthworks for installation of the conveyance pipeline under Rule E26.5.3.1(A95) and E26.5.3.1(96), where the earthworks are progressively stabilised so that the area and volume of work remains within the permitted thresholds;
- Earthworks up to 10,000m² where land has a slope less than 10 degrees outside the Sediment Control Protection Area other than for maintenance, repair, renewal, minor infrastructure upgrading is a Permitted Activity under standard E26.5.3.2 (A101);
- Earthworks up to 2,500m² within a Sediment Control Protection Area for the conveyance pipeline within Lucy Moore Memorial Park (50m landward of a watercourse) under E26.5.3.2(A105);
- Noise and vibration from construction activities associated with the conveyance pipeline meeting the construction noise and vibration standards (Rule E25.6.1 (3), E25.6.29 (1)(a), E25.6.29 (1)(b) and E25.6.30));
- Tree trimming within the road reserve under rule E26.4.3.1(A83);
- Tree trimming, alteration or removal on roads adjoining rural zones and on roads adjoining the Future Urban Zone under Rule E26.4.3.1(A90). Specifically, this relates to trees identified as T130-T133 in the Arboricultural Assessment;
- Infrastructure (underground network utilities) within an Outstanding Natural Landscape and High Natural Character overlay under Rule E26.13.3(A180). Specifically, this relates to the installation of the conveyance pipeline beneath the Mahurangi River, which is subject to these overlays;
- The diversion and discharge of stormwater runoff from impervious areas up to 5,000m² outside an urban area (at DPSA1 and DPSA2) under Rule E8.4.1(A7) meeting the permitted standards;
- The diversion and discharge of stormwater runoff from impervious areas up to 1,000m² within an urban area (at DPWWS) under Rule E8.4.1(A8) where a connection to a stormwater network is not possible, and meeting the permitted standards;
- Dewatering associated with a permitted groundwater diversion, is permitted under Rule E7.4.1(A17);
- Structures under the Mahurangi River is permitted under Rule E3.4.1(A40);
- Culverts are permitted under Rule E26.2.3.1(A58) provided that they meet the relevant standards;
- Should the bore at 198 Sandspit Road require decommissioning and a replacement be provided, this is considered to be provided for as a permitted activity under Rule E7.4.1(A40) and (A39) subject to the replacement bore being located within 10m of the existing bore.

In this case the use of the permitted baseline is not considered to be useful for discounting effects of the proposal given the scale and complexity of the works proposed, such that it is considered prudent to assess all actual and potential effects relating to the proposal, whether permitted or otherwise.

Assessment

Receiving environment

The receiving environment is made up of:

- the existing environment and associated effects from lawfully established activities;
- effects from any consents on the subject site (not impacted by proposal) that are likely to be implemented;
- the existing environment as modified by any resource consents granted and likely to be implemented; and
- the environment as likely to be modified by activities permitted in the plan.

This is the reasonably foreseeable environment within which the adverse effects of the proposal are considered. In this case:

- The existing environment is outlined in Section 2 of this report.
- All relevant consents which are located on the subject sites. Given these consents are directly related to and are required for the activities in the current application to take place, it is considered that these will be implemented.

Adverse effects

Tree alteration and removal

Mr Gavin Donaldson, Senior Arborist for Council has reviewed the application, and advised that the tree report provided sufficiently details each tree that will be encountered along the proposed pipe route and the reason for the proposed removal, pruning or working within the root zone. Removal is generally restricted to those which are identified as being in poor condition, and where the route is within Auckland Council land (Lucy Moore Memorial Park), and it is noted that landowner approval has been provided by the Community Facilities Arborist. Mr Donaldson has not raised any concerns with the methodology for works and tree protection and has recommended that these be conditioned in order to ensure the works are undertaken by a suitably qualified arborist and earthworks within the protected root zone are supervised by the same. A similar condition has been proposed by Watercare and is therefore considered to be part of the application proposal.

I concur with Mr Donaldson's assessment, and conclude that the tree removals and alterations are reasonable for the type of works required. Mr Donaldson agrees that the alignment and construction methodology have been chosen in order to minimise removal and effects on adjacent trees as much as possible. Mitigation within the park through the use of replacement of larger grade trees has been proposed, which is deemed to be acceptable by Mr Donaldson and the Community Facilities Arborist.

In terms of visual and amenity effects from the tree removal proposed, while it is considered that the loss of these trees will be noticeable to those who frequent the park, the park will still retain the overall sense of openness, naturalness and will still provide for the amenity of the of the community. Those trees which are most significant in terms of landscape and cultural values have been avoided, and as mentioned above, the removed trees will be replaced by large grade planting which will immediately mitigate the loss. Overall the effects on remaining trees within the park and road reserve will be less than minor.

Ecology

The proposed installation of the pipeline and the widening/realignment of the existing access road (Hamatana Road) both require works within and removal of vegetation marked as being within the SEA terrestrial overlays (6684 and 3731). The majority of this vegetation removal will occur in the vicinity of the existing access road, where the road has been formed over an existing stream/coastal marine area reclamation which connects the land to the east and west. As such, the vegetation which flanks the access road is a mixture of coastal marine, terrestrial and riparian vegetation.

Sam Sutherland, Ecologist for Council has assessed the proposal, and has advised that the proposal will result in the following ecological effects:

- Loss or alteration of indigenous mangrove forest and scrub
- Potential loss of threatened lichen species which are known to be present on mangroves
- Loss of terrestrial vegetation
- Loss of nesting and foraging habitat for native birds including coastal birds which use mangroves
- Potential fish passage barriers if culverts are designed or installed incorrectly
- Increased sediment discharge during construction
- Reduction in stream habitat for the western culvert although stream quality is currently low due to modification, stock access and weeds.

The ecological effects associated with sedimentation discharge from earthworks and the installation of the culverts in this area is discussed further within the following sections, so that this section has focused only on the effects related to the vegetation removal.

The applicant has proposed a suite of mitigation measures to address the above effects, which include:

- Construction of the road on land as much as possible to avoid disturbance of the coastal marine area
- Undertaking a nesting bird survey (particularly for banded rail) prior to vegetation removal and earthworks commencing
- Native revegetation planting on the new fill slopes and alongside the stream banks
- A weed control plan

With regard to the threatened lichen species which are often present on mangroves, the applicant's ecologist has provided a review of lichen research in the area and consulted with an Auckland based lichen expert, and has advised that the overall risk of substantive impact on the lichen population (threatened lichen included) to critical levels is very low due to the minor scale of clearance (<0.01% of the wider mangrove forest) and that potential mitigation methods are limited and experimental. Ms Sutherland has accepted these comments and recommends that the effects on the lichen species is not likely to be significant. The applicant has proposed

conditions relating to the removal of mangroves and disposal outside of the CMA which are reiterated by Ms Sutherland.

With regards to the revegetation planting, Ms Sutherland advises that the species, sizing and spacing are appropriate mitigation. Conditions of consent relating to the planting maintenance and survival have been recommended by both Ms Sutherland and the applicant and are therefore inherent in the application.

Additional conditions have been recommended by Ms Sutherland which will ensure the protection of nesting birds and any fish species which may be present in the area of works, and these have also been accepted by the applicant.

With regard to the SEA at 198 Sandspit Road, the applicant is proposing to use trenchless shafting of the pipe below the ground and beneath Puhinui Scenic Reserve. As such, no vegetation removal, alteration or disturbance is anticipated, and therefore the effects on ecology in this area have not be assessed by Council.

Overall, it is considered that the vegetation removal and earthworks proposed in this area are reasonable in order to provide for the outcomes desired by the applicant and that the works will impact on a relatively small area overall. The resultant effects on marine, freshwater and terrestrial ecology will be sufficiently mitigated by the methods discussed above, such that these effects will be less than minor overall.

Groundwater and ground settlement

The applicants AEE identifies the potential for ground settlement which may occur along the pipeline route due to construction and operation of the pipeline and pump stations (groundwater drawdown, deflection from retention structures and mechanical settlement from pipeline installation) as well as on groundwater takes and the Mahurangi River.

In terms of ground settlement, potential effects were considered to be limited to two areas, being within the Lucy Moore Memorial Park/Baxter Street and along Sandspit Road/Mahurangi East Road between chainage 5900 and 7380.

Within the vicinity of the park and Baxter Street, the magnitude of the effect will be dependent on the type of trenchless method selected, however there is the potential for damage to surrounding buildings and underground services. The use of supports and a Groundwater and Settlement Monitoring and Contingency Plan have been proposed by the applicant in order to mitigate these effects, which has been endorsed by Pat Shorten, Consultant Groundwater and Geotechnical specialist on behalf of Council.

With regard to groundwater drawdown effects on the Mahurangi River, the applicant considers that this will not impact on the overall water levels of the river. Any groundwater abstracted during construction will be discharged back to the river (following filtration) and will therefore offset any small depletion effect resulting from abstraction during construction.

With regard to water quality, Mr Shorten considers that the adjacent terrestrial and freshwater ecosystems, including the underlying Mahurangi aquifer will not be adversely affected by the groundwater activities.

Similarly, Mr Shorten has not raised any fundamental issues with the proposed works relating to ground settlement and dewatering, stating that the effects will be short term and will remain within the assessment envelope. Mr Shorten has recommended that the effects can be

adequately mitigated through conditions of consent, including a number of pre-works surveys and monitoring of ground and groundwater levels. The applicant has accepted these conditions and these therefore form part of the application.

I concur with Mr Shorten's assessment and conclude that subject to the implementation of the conditions, the effects on groundwater diversion and dewatering will be less than minor overall.

Construction noise and vibration

The applicant has identified that the construction of the pipeline through trenched and trenchless methods has the potential to generate high noise and vibration levels where works are within the road corridor (Sandspit Rd/Mahurangi East Rd) and at the trenchless launch site on Baxter Street. While most machinery and equipment will only cause minimal breaches to the 70dB noise limits, certain items such as pavement saws and jack hammers will reach between 80-86DB when measured 30m away from unscreened residential receivers. These exceedances trigger the requirement for noise mitigation and effects management by way of Construction Noise and Vibration Management Plan (CNVMP). The applicant has proposed a number of mitigation methods including the use of screening (where possible), use of quieter methods of construction work, limiting the timing of works, which have been reviewed and endorsed by Council's Acoustic Engineer, Lindsay Leitch. In terms of timeframes, each phase of construction works is expected to take between 10 -18 months to complete, however given the nature of the works, it is unlikely that the noise exceedances will occur during the full construction period.

While there is some concern about compliance with maximum noise and vibration levels at certain receivers (discussed further in the limited notification assessment below), effects on the environment more generally are considered to be acceptable, subject to the preparation and certification of a CNVMP confirming the details for mitigation measures to be used. I consider that while the construction noise and vibration will be noticeable in the wider environment, these effects are generally anticipated from large scale infrastructure works, will be temporary and can be suitably mitigated, such that the effects are no more than minor overall.

Earthworks and streamworks and sediment discharge

As noted above, earth and stream works are required in order to install the conveyance pipeline, construct the pump stations and upgrade the private access road. With regard to the trenching works (within the park and road areas), the applicant has proposed to undertake these in a staged manner in order to comply with the permitted activity standards for regional earthworks. This assessment is therefore focused on the works required for the pump stations (DPWWS, DPSA1 and DPSA2) and the access road upgrade.

Fiona Harte, Earth and Streamworks Specialist has assessed the proposed earthworks and notes that due to the location and nature of works, there is a risk of sediment laden water discharging to both freshwater environments and the coastal marine area. The applicant has identified that further disturbance is likely if excavators are used within the CMA to reach areas which are not able to be accessed by machinery on land. Indicative earthworks methodology and erosion and sediment control plans have been provided to address the works around the DPSA1, DPSA2 and the private access road. Such controls include (but are not limited to) the use of stabilised construction entrances, super silt fences and sediment retention ponds. Given the final design is to be confirmed by the earthworks contractors, Ms Harte has recommended conditions of consent requiring final erosion and sediment control plans, including any chemical

treatment management plans (if chemical treatment is chosen) are provided for certification to Council prior to the works being undertaken. Furthermore, given the nature of the work, being in close proximity to a sensitive receiving environment, Ms Harte has recommended that conditions of consent be imposed restricting works outside of the standard earthworks season. The applicant has stated that while works will be primarily undertaken within the earthworks season, due to the tight programme of works, winter works approval may be sought in order to complete the required works. Ms Harte's proposed condition currently prevents winter works occurring however in the event approval is sought, additional controls can be imposed, as necessary to control potential effects associated with works during the winter season. The applicant has agreed to these conditions and these therefore form part of the application proposal. Provided that the works are undertaken in accordance with the application documents, GD05 and the recommended conditions, Ms Harte considers that the resulting effects on the environment from sediment discharges will be appropriately managed.

In relation to the streamworks for the private access road, Ms Harte notes that there is a risk of permanent loss of river bed within a significant ecological area and ongoing hydraulic and ecological effects associated with the operation of culvert structures (maintaining fish passage, erosion and scour at the culvert inlets, outlets and embankments). The applicant is proposing to create a cofferdam at low tide and in dry weather in order to remove the existing culverts and install the new culverts. Some excavation will be required as part of these works, and any water found within the dam will be pumped to a sediment pond on land and discharged back to the coastal marine area after treatment. Ms Harte notes that while the methodology for the installation has been provided, aspects of the culvert design are lacking in detail, as the final designs are to be confirmed by the respective works contractor who have not yet been engaged. The applicant has provided general guidance for the design and has proposed a condition requiring the final detailed culvert design to be submitted to council for certification, which includes provision of fish passage, capacity for flood flows and prevention of erosion. Ms Harte has advised that without this detail she is not able to confirm whether or not the effects resulting from the installation of the new culverts are acceptable and has raised concern that that further consents may be required dependent on the final design. While I agree with Ms Harte that a full assessment is desirable prior to a decision on the application being made, I consider that the proposed condition will be sufficient to ensure that a suitable design is provided, and therefore the ecological effects associated with the replacement culverts will not be any greater than minor.

At the DPSA1, reclamation is required in order to construct the pump station in the location consented by LAN67900. The applicant has provided a stream ecological valuation (SEV) which considers that the existing stream values are relatively low (0.328 out of a possible 1) reflective of the lack of riparian vegetation, degradation of the channel through stock access, presence of fish barriers and a small number of macroinvertebrates. The applicant's ecologist considers that due to the low value of the stream, the ecological effects of reclamation on terrestrial and freshwater ecology is low. Nevertheless, an assessment of alternatives has been provided. As the location has been previously consented, the applicant considers that total avoidance is not possible. Diversion is also not possible in this instance, as the site is not large enough to accommodate the pump station, the full stream reach and required riparian margins. Enhancement on the neighbouring site, and on the same stream was also considered, however the applicant was not able to gain landowner approval for additional land purchase nor protection of any enhanced areas. Finally, stream mitigation sites have been considered within the wider area on both land owned by the applicant and on private land, however there is either

limited potential to mitigate for the stream loss, or landowner approval has not been obtained to date. As the applicant has not been able to secure a suitable site for mitigation to date, the applicant has proposed a condition that a suitable site is found within 6 months of completion of the works, or that replacement is provided at a minimum ratio of 1:1 within the same catchment.

As with the culvert assessment, Ms Harte considers that a full assessment of the effects on the stream values cannot be undertaken at this time, as without a fixed site for offset, the required offset cannot be calculated. Ms Harte is also of the opinion that the loss of 110m of stream is more than minor however no definitive ecological rationale has been provided as a basis for this opinion. While I agree with Ms Harte that it is desirable to undertake an assessment of the stream loss and any proposed mitigation upfront, I consider that the applicant has undertaken a reasonable assessment of available alternatives, without being able to secure a site for mitigation to occur. Although a mitigation site has not yet been identified the applicant is proposing to undertake appropriate mitigation for the loss of stream commensurate with the SEV calculations to the satisfaction of Council and certified via an appropriate condition of consent to ensure that overall effects will be appropriate. Further, I concur with the applicant's ecologist that the loss of terrestrial and stream habitat will have effects that are minor in scale, given the low stream values at present, and low potential values.

Altogether, I consider that the earth and stream works proposed will be adequately mitigated by way of proposed conditions, such that the resulting effects will be no more than minor.

Natural hazards

The applicant has identified that several sites within the project corridor are subject to natural hazards, namely land instability and flooding. At the DPSA1 site, the proposed earthworks will result in the existing stream (overland flow path) being piped around the pump station structure and maintaining the same entry and exit points. At the private access road site, the filling will occur within the stream and coastal marine areas, immediately adjacent to the existing culverts, which are being replaced in order to both accommodate the widened road and flood flows, which are currently an issue in this area. In terms of mitigation, the applicant has proposed to undertake works where possible within the earthworks season, and at flood prone areas will be monitoring the weather forecasts to avoid works during potential flood periods.

Council's Senior Regulatory Engineer, Samuel Holmes has reviewed the application and has not raised any substantial issues with regard to the flood risk. It is noted that at the DPSA1 site that only a small portion of the works area is shown to be within the 1% AEP floodplain, and that the pump station will be located on slightly higher ground adjacent to the road, such that the flood flows are unlikely to result in a decrease in the capacity of the floodplain.

With regard to land stability resulting from earthworks, Mr Holmes notes that there are sites within the project area which are subject to slope instability and specific stabilisation methods have been provided for each site. Mr Holmes also notes that the larger consented areas and corridor of works allows the contractor to choose an alternative route as necessary due to onsite conditions that may vary from the findings of the geotechnical report. Provided that the works are designed and supervised by a suitably qualified engineer and is in accordance with the recommendations of the geotechnical report, Mr Holmes considers that the land stability effects will be acceptable. The conditions in relation to land stability have been accepted by the applicant and therefore forms part of the application.

Given the above, it is considered that the natural hazard risks associated with the proposal will have adverse effects which are less than minor overall.

Adverse effects conclusions

It is considered that the overall adverse effects on the environment will be no more than minor.

Step 4: public notification in special circumstances

If an application has not been publicly notified as a result of any of the previous steps, then the council is required to determine whether special circumstances exist that warrant it being publicly notified (s95A(9)).

Special circumstances are those that are:

- exceptional or unusual, but something less than extraordinary
- outside of the common run of applications of this nature, or
- circumstances which makes notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.

In this instance I have turned my mind specifically to the existence of any special circumstances and conclude that there is nothing exceptional or unusual about the application, and that the proposal has nothing out of the ordinary run of things to suggest that public notification should occur.

Public notification conclusion

Having undertaken the s95A public notification tests, the following conclusions are reached:

- Under step 1, public notification is not mandatory.
- Under step 2, there is no rule or NES that specifically precludes public notification of the activities, and the application is for an activity other than those specified in s95A(5)(b).
- Under step 3, public notification is not required as the application is for an activity that is not subject to a rule that specifically requires it, and it is considered that the activity will have or is likely to have adverse effects on the environment that are no more than minor.
- Under step 4, there are no special circumstances that warrant the application being publicly notified.

It is therefore recommended that this application be processed without public notification.

6. Limited notification assessment (sections 95B, 95E-95G)

If the application is not publicly notified under s95A, the council must follow the steps set out in s95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

Step 1: certain affected protected customary rights groups must be notified

There are no protected customary rights groups or customary marine title groups affected by the proposed activity (s95B(2)). The applicant has informed all applicants for customary marine title

under the Marine and Coastal Area Act (MACA) of the proposal and has maintained correspondence with the one claimant who has expressed interest in the proposal.

In addition, the council must determine whether the proposed activity is on or adjacent to, or may affect, land that is subject of a statutory acknowledgement under schedule 11, and whether the person to whom the statutory acknowledgement is made is an affected person (s95B(3)). Within the Auckland region the following statutory acknowledgements are relevant:

- Te Uri o Hau Claims Settlement Act 2002
- Ngāti Manuhiri Claims Settlement Act 2012
- Ngāti Whātua Ōrākei Claims Settlement Act 2012
- Ngāti Whātua o Kaipara Claims Settlement Act 2013
- Te Kawerau ā Maki Claims Settlement Act 2015
- Ngai Tai Ki Tamaki Claims Settlement Act 2018
- Ngati Tamaoho Claims Settlement Act 2018

In this instance, the proposal will occur within the coastal marine area and on land adjacent to the coastal marine areas that are subject to statutory acknowledgements, namely those by Ngati Manuhiri, Ngai Tai Ki Tamaki and Te Kawerau a Maki. Prior to lodgement of the application, the applicant has contacted all mana whenua groups with potential interest in the project area and consultation was held with all groups who expressed interest in the project. Regardless of this prior consultation, all iwi groups have been notified of the application through the weekly register of consents, and at the time of writing no further comments from any groups have been received relating to their claims, or any effects on mana whenua interests in general. It can therefore be concluded that the effects on any customary rights groups is less than minor.

Step 2: if not required by step 1, limited notification precluded in certain circumstances

The application is not precluded from limited notification as:

- the application is not for one or more activities that are exclusively subject to a rule or NES which preclude limited notification (s95B(6)(a)), and
- the application is not exclusively for one or both of the following: a controlled activity, other than a subdivision, that requires consent under a district plan; or a prescribed activity (s95B(6)(b)).

Step 3: if not precluded by step 2, certain other affected persons must be notified

As this application is not for a boundary activity or a prescribed activity, there are no affected persons related to those types of activities (s95B(7)).

The following assessment addresses whether there are any affected persons that the application is required to be limited notified to (s95B(8)).

In determining whether a person is an affected person:

- a person is affected if the activity's adverse effects on that person are minor or more than minor (but not less than minor)
- adverse effects permitted by a rule in a plan or NES (the permitted baseline) may be disregarded, and

- the adverse effects on those persons who have provided their written approval must be disregarded.

Adversely affected persons assessment (sections 95B(8) and 95E)

No persons are considered to be adversely affected by the activities because:

- While construction noise limits will be exceeded by certain machinery and equipment during undertaking the trenchless and trenched construction of the pipeline, particularly within the road and at the Baxter Street trenchless launch site, it is considered the exceedances can be reduced to acceptable levels through the implementation of noise barriers (where possible), restricting timing of works, adoption of quieter methods of works and advanced notice of works to anyone who will be affected by noise levels higher than the permitted levels. These mitigation methods are considered to be acceptable and will be included within the certified CNVMP. Given the linear nature of the works, it is anticipated that the effects from noise from works along Sandspit and Mahurangi East Road will be temporary (i.e. will not last the entire 10-18 months) as a new section of pipeline is laid within the road or road reserve adjacent to each property. For the works at Baxter Street, the surrounding environment is mainly commercial in nature, and again can be mitigated through the use of noise screening to reduce the noise to a compliant level. Overall the noise levels are considered to be consistent with large scale infrastructure projects and reasonably anticipated from these types of works, and will be sufficiently mitigated such that the effects on any persons are less than minor.
- All construction activities which are anticipated to cause high-vibration emission (excavation, vibratory rollers, sheet piling and rock breaking) are anticipated to comply with the vibration limits for both residential and non-residential receivers. While some of these effects may be felt by those in close proximity to the activities, the overall effects are considered to be negligible. The applicant has also proposed to undertake building surveys for those within 15m of the works in order to monitor any cosmetic damage which could occur.
- Similarly, the potential ground settlement effects from the trenchless pipeline installation methods are proposed to be strictly monitored before, during and after construction through building condition surveys to avoid damage to any nearby buildings. All sites which are considered to be at risk are identified within the condition, and this condition has been deemed to be suitable by Council's geotechnical expert Mr Shorten.
- It is not considered that the groundwater drawdown will adversely affect groundwater users, aside from the one user of one bore (1133) at 198 Sandspit Road, where the current pump may not be sufficient to draw water during and after drawdown occurs. A new bore has been applied for should decommissioning and replacement be required, such that the owner and or occupier of this property will have continued access to water for stock drinking and domestic purposes. It is noted that the dwelling will have continued access to domestic water supply by way rainwater collection tanks. No issues have been raised by Mr Shorten in regard to the replacement of this bore.
- It is not considered that the filling within the 1% AEP floodplain will have a noticeable effect on the flood capacity and will therefore not result in increased flood risk to any land or buildings surrounding the DPSA1 or the private access road.
- All works in areas subject to land instability will be subject to engineering design and supervision, such that these areas will be stabilised following works and will not have adverse effects on neighbouring land or buildings.

- The proposed vegetation removal within Lucy Moore Memorial Park is not considered to be noticeable from any surrounding dwellings, given the topography of the park and presence of other mature trees and vegetation. The proposal will avoid any notable trees which have cultural and landscape values, and will instead remove a relatively small number of trees which are located centrally within the park. The removed trees will be replaced immediately with large grade species and it is considered that the naturalness and openness of the park when viewed from neighbouring sites, will remain. With regard to the vegetation removal for the private access road upgrade, the vegetation removal will be undertaken in an area which is not readily accessible or visible from neighbouring sites or the public. In the context of the area, the scale of riparian and coastal vegetation removal is considered to be relatively small, and any visual or amenity effects will be largely mitigated through replacement planting, where possible.
- It is noted that the applicant has liaised with several affected landowners where the works will occur on land outside of their ownership. To date, landowner approval has only been received from Auckland Council Community facilities, noting that under the Local Government Act (LGA), where landowner approval is not obtained, the landowner will be notified of works and is able to object under s181 of the Act. Irrespective of the LGA process, consideration still needs to be given to the private landowners in terms of adverse effects. The pipeline will be located underground when passing through private property and the works associated with the trenching will be undertaken in accordance with best practice and it is therefore considered that the temporary construction period will not adversely affect the owners and occupiers of the affected private properties, notably in terms of construction effects on amenity values, sediment discharge and land stability. Given that the works will be occurring to the rear of private properties it is not expected that during the works period, access to these properties will be restricted.

Step 4: further notification in special circumstances

In addition to the findings of the previous steps, the council is also required to determine whether special circumstances exist in relation to the application that warrant it being notified to any other persons not already determined as eligible for limited notification.

Special circumstances are those that are:

- exceptional or unusual, but something less than extraordinary;
- outside of the common run of applications of this nature; or
- circumstances which make limited notification to any other person desirable, notwithstanding the conclusion that no other person has been considered eligible.

In this instance I have turned my mind specifically to the existence of any special circumstances under s95B(10) and conclude that there is nothing exceptional or unusual about the application, and that the proposal has nothing out of the ordinary run of things to suggest that notification to any other persons should occur.

Limited notification conclusion

Having undertaken the s95B limited notification tests, the following conclusions are reached:

- Under step 1, limited notification is not mandatory.

- Under step 2, there is no rule or NES that specifically precludes limited notification of the activities, and the application is for an activity other than those specified in s95B(6)(b).
- Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons.
- Under step 4, there are no special circumstances that warrant the application being limited notified to any persons.

It is therefore recommended that this application be processed without limited notification.

7. Notification recommendation

Non-notification

For the above reasons under section 95A these application may be processed without public notification.

In addition under section 95B limited notification is not required.

Accordingly I recommend that these application are processed non-notified.

Sarah Saxon
Intermediate Planner
Resource Consents

Date

8. Notification determination

Acting under delegated authority, and for the reasons set out in the above assessment and recommendation, under sections 95A and 95C to 95D, and 95B and 95E to 95G of the RMA these applications shall be processed non-notified.



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Nicola Broadbent
Team Leader
Resource Consents

Date: 31/07/2019

Consideration of the applications

9. Statutory considerations

Under s104B the council may grant or refuse consent for a discretionary or non-complying activity. If it grants the application, it may impose conditions under s108 of the RMA.

The council must have regard to Part 2 of the RMA (“Purposes and Principles” – ss5 to 8), ss104, 104B, 104D, 108, of the RMA. The weighing up under s104 is subject to Part 2.

10. Actual and potential effects on the environment

Sections 104(1)(a) and 104(1)(ab) of the RMA requires the council to have regard to:

- any actual and potential effects on the environment of allowing the activity (including both the positive and the adverse effects), and
- any measure proposed to or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.

Positive effects

The proposal will have the following positive effects:

- The pipeline will provide one of the last pieces of the sub-regional wastewater upgrades and therefore the capacity to accommodate the future growth of Warkworth, Snells Beach and Algies Bay areas.

Adverse effects

In considering the adverse effects, the council:

- may disregard those effects where the plan permits an activity with that effect; and
- must disregard those effects on a person who has provided written approval.

The assessment and conclusion of the “permitted baseline” for the s95A adverse effects assessment are considered applicable to s104(2), and so are not repeated here.

Any adverse effects on persons who have provided written approvals are disregarded. In this instance, no written approvals were provided, although landowner approval has been given for the works within Lucy Moore Memorial Park by the Council’s Community Facilities department.

The assessment of adverse effects done for notification identified and evaluated adverse effects only, and these are adopted for the purposes of s104(1)(a).

Measures proposed to compensate or offset adverse effects

The applicant has proposed to undertake stream enhancement works to mitigate for the loss of 110m of intermittent stream at the DPSA1 site. At the time of writing, the applicant has not been able to secure a mitigation site therefore has proposed this as a condition of consent.

Summary

Actual and potential effects

The actual and potential adverse effects of the proposal are discussed in Sections 5 and 6 above. When balanced with the positive effects from the proposal and the proposed stream enhancement, and subject to compliance with the recommended conditions, it is considered that the effects overall will be no more than minor and acceptable.

11. Relevant statutory instruments

National Environmental Standard – s104(1)(b)(i)

There are no National Environmental Standards which are relevant to the assessment of this consent.

National Policy Statement – s104(1)(b)(iii)

The National Policy Statement for Freshwater Management is considered to be relevant to the application given the works involve dewatering, stream reclamation, installation of a culvert and associated earthworks within close proximity to a number of streams. The relevant objectives and policies include Objectives AA1, A1, A2, B1, C1 and D1 as well as Policies A3, B5, C1 and D1.

In relation to water quality, while the applicant has not provided a final ESCP, the proposed methods and conditions of consent agreed are considered to adequately manage sediment discharge from the earthworks activities in proximity to the tributaries of the Mahurangi River. The position of the pipeline beneath the Mahurangi River allows the pipe to be installed deep enough to use trenchless methods which will avoid works within the riverbed and any associated discharges in this area. Some concern has been raised by mana whenua in relation to potential leaks during the use of the wastewater pipeline on water quality, however Watercare have clarified the design of the pipe, methods of installation and measures for detection of any leaks in this area to ensure that water quality is not affected from failure of the pipe to operate in a manner that would result in leaks.

Water quantity in the Mahurangi River and the underlying aquifers are not considered to be significantly affected by groundwater drawdown during construction given the close connection to the coastal environment. Any groundwater which is abstracted as part of the construction is proposed to be discharged back into the river following construction which will replace the small amount which may be removed.

The proposed reclamation of the stream at DPSA1 however is not considered to be consistent with the NPS:FM, given there will be a permanent loss of stream habitat on the site. While this stream is considered to be of relatively low value at present, the objectives and policies aim to protect and enhance the life supporting capacity of streams, the stream ecology and stream processes, and do not take into account the any offsetting for loss of these values.

Overall the proposal is considered to be partly consistent with the objectives and policies of the NPS:FM.

New Zealand Coastal Policy Statement (NZCPS) – s104(1)(b)(iv)

The purpose of the NZCPS is to state policies in order to achieve the purpose of the RMA in relation to the coastal environment of New Zealand. The relevant objectives and policies include Objectives 1 – 6 and Policies 1-4, 6, 10, 11, 14, 20, 22 and 25.

The overall area of works which will occur in the CMA is not considered to be significant given the scale of the project, and will be limited to the earthworks, mangroves removal and culvert installation on the private access road. The works in this area will address localised flooding issues by allowing for greater flow capacity through the new culverts, enhanced access of large vehicles to and from the WWTP and will allow for the installation of the conveyance pipeline. Works within and adjacent to the CMA therefore cannot be avoided in this instance and have been limited to the extent necessary to provide the above mentioned upgrades. Mitigation measures for sediment discharge have been proposed and those relating to earthworks in particular will be finalised through a certified ESCP. Subject to these measures being correctly implemented, it is considered that the sediment discharge effects will be minor and acceptable.

With regards to preservation of the natural character, features and landscapes of the coastal environment, it is noted that the area has previously been modified through the previous reclamation of the road and the surrounding land uses, which include low density residential development, farming and industrial activities. While some natural features such as the estuarine vegetation remain, there is not considered to be high natural character or landscape value within this immediate area. Again, the loss of vegetation in this area will be relatively low level, and only what is required to facilitate the road widening. Mitigation planting in the riparian areas is proposed and has been accepted by Council's ecologist, and it is likely that natural regeneration of mangroves will occur in this area following construction as well.

Altogether it is considered that the proposal will be consistent with the relevant provisions of the NZCPS.

Hauraki Gulf Marine Park Act 2000 (HGMPA) – s104(1)(b)(iv)

For the coastal environment of the Hauraki Gulf, the HGMPA requires that sections 7 and 8 of that Act must be treated as a New Zealand coastal policy statement. Given the similarity of the HGMPA provisions to the NZCPS, I consider that the proposal will be consistent with the HGMPA and refer to the discussion of the NZCPS matters above.

Auckland Unitary Plan (Operative in part): Chapter B Regional Policy Statement – s104(1)(b)(v)

Chapter B of the AUP(OP) sets out the strategic framework for the identified issues of significance, and resultant priorities and outcomes sought. These align with the direction contained in the Auckland Plan. Of particular relevance to this consent are Chapters B2, B3, B7 and B8. Accommodating growth is noted as a key issue in the region and the AUP:OP introduces a greater focus on the operation and development of efficiency of significant infrastructure, its integration with urban growth and improving resilience. The RPS provides for and recognises the functional and operational needs of infrastructure to be located in areas with sensitive physical and natural resources is emphasised, as is also protecting the quality of the natural environment and managing the effects on existing infrastructure.

The purpose of Chapters B2 Urban Growth and Form and B3 Infrastructure, Transport and Energy is to support integrated planning for housing, employment, infrastructure and other services. The provisions of these chapters enable the provision of infrastructure which is safe, efficient and effective and supports the future growth of the urban areas of Auckland, while maintaining the quality of the environment. In this case, the proposed wastewater pipeline will provide for the anticipated growth of the Warkworth, Snells Beach and Algies Bay areas which have been zoned for further residential development.

Chapter B7, Natural Resources is considered relevant as the objectives and policies in section B7.3 seek to ensure the enhancement of degraded freshwater systems, the loss of freshwater system is minimised and that any adverse effects are avoided, remedied or mitigated. Section 7.4 seeks to maintain water quality in freshwater bodies and coastal waters which have good water quality, and to enhance the water quality in degraded systems. These provisions are considered to be the same as those within the NPS:FM which is discussed above, such that the assessment is not repeated here.

Finally, Chapter B8 Coastal Environment outlines the expectations for development within the coastal environments throughout the region. These provisions seek to avoid inappropriate development, particularly where there are high natural character values, and where development does not have a functional need to be located in the CMA. In this case, works within the CMA are considered to be reasonable to allow for the widening of the road, which provides for use and ongoing maintenance of significant infrastructure. The encroachment into the CMA has been reduced where possible to avoid adverse effects on the CMA and the location of works will also avoid any areas of high natural character.

Altogether it is considered that the proposal will be largely consistent with the RPS.

Plan or Proposed Plan – section 104(1)(b)(vi)

Auckland Unitary Plan (Operative in part)

Relevant objectives and policies

Significant Ecological Areas

The provisions of the SEA overlays D9.2 and D9.3 aim to preserve and enhance significant indigenous biodiversity where possible, and where adverse effects will occur, to mitigate through restoration and enhancement measures. The scale of SEA removal adjacent to the private access road has been reduced to the extent required for the road widening and pipeline installation beneath the road. In the larger scale of the overall SEA, the removal will be relatively small, and will be mitigated through replacement planting of native riparian species, which have been reviewed by Council's ecologist.

Lakes, streams and wetlands

With regard to the proposed culverts and stream reclamation, the relevant objectives and policies are found in E3.2 and E3.3 respectively of the AUP:OP. These objectives and policies seek to ensure that practicable alternatives are sought, structures are designed to the minimum size necessary, permanent loss is minimised and significant modification to streams are avoided; and where adverse effects cannot be avoided, remedied or mitigated, the residual effects be can be offset by providing environmental benefits either onsite or offsite. In this case, the applicant has provided an adequate consideration of alternatives for reclamation at DPSA1,

noting that the previous land use consent for the location of the pump station has effectively fixed this in place. While no suitable mitigation site has yet been provided the applicant has committed to ensuring that this will occur via a condition of consent with details to be certified by Council once a mitigation site has been secured. With regards to the culvert, again without detailed design the full effects of the culvert on the stream values is not able to be assessed, however it is noted that design cannot be provided until the contract is awarded to the works engineers. The applicant has provided an outline for design to include the required elements (flood flow, fish passage, scour prevention etc) and the final design will be certified by Council, in accordance with the agreed to conditions.

As with many of the other provisions of the AUP(OP), these objectives and policies recognise the need for reclamation and other works to occur within streams to enable infrastructure provision and allow for such works, where suitable mitigation measures are in place.

Land Disturbance – District

Objectives E12.2 and policies E12.3 of the District Land Disturbance chapter aim to allow land disturbance where works are undertaken in a manner that protects safety of people and mitigated adverse effects on the environment. In this case, the works will be undertaken in accordance with Auckland Council's best practice guidelines (GD05) and will be designed and supervised by suitably qualified engineers, in order to ensure that erosion and stability effects will not occur on any adjacent land or structures.

Land Disturbance – Regional

The provisions of the regional land disturbance chapter E11.2 and E11.3 are largely similar to that of the district land disturbance chapter, while also recognising the role of sediment generation and potential for adverse effects of sediment on freshwater and coastal environments. In this case, the proposed works at DP1A1 and adjacent to the private access road have the potential to cause sediment runoff into the adjacent streams and coastal waters. The applicant has provided an indicative ESCP and provided these measures are correctly implemented and upkept, the potential effects on the sensitive receiving environments are considered to be acceptable.

Vegetation Management and Biodiversity

As with the SEA overlay provisions, the objectives and policies within E15.2 and E15.3 aim to primarily maintain indigenous biodiversity values, while providing for appropriate development. The alignment of the pipeline has been chosen to avoid the removal of vegetation, particularly high value vegetation where possible, and effects are considered to be appropriately mitigated through the use of replacement planting, both within the park and adjacent to the private access road.

Trees in Open Space Zones and Roads

The provisions within E16.2, E16.3, E17.2 and E17.3 recognise that trees contribute to the amenity, landscape and ecological values of roads and open spaces. While these provisions do not explicitly provide for removal related to infrastructure, these recognise that there are other functional requirements and uses which will conflict with the provision of trees in roads and public spaces. Given there are a large number of trees and other vegetation within and around the park and roads, it is not considered that the removal of trees within the park or road reserve will adversely affect the landscape and amenity values overall.

Infrastructure

These objectives and policies recognise the importance of infrastructure provision in the growth of the Auckland Region, enhancement of quality of life for communities and provision of health and safety of communities. These policies particularly enable operation and construction of infrastructure where the adverse effects are suitably avoided, mitigated or remedied. As noted previously, the works will provide for future wastewater capacity of the Warkworth and Snells Beach areas, which will allow for additional growth in the area. The pipeline itself will provide the link to the already consented WWTP which will ensure the health and safety of the community by providing high level treatment of wastewater, prior to discharge in the coastal environment.

Noise and Vibration

The provisions of E25.2 and E25.3 aim to protect people from unreasonable levels of noise and vibration and maintain residential amenity, while also allow for general construction related activities. In this case, construction noise and vibration from equipment and machinery used to excavate land and install the pipeline are unable to be avoided, and will be of a level which is not dissimilar to other major infrastructure works. The linear nature of the works will ensure that in most places, the works will be temporary only, and best practice methods are proposed to be employed in order to minimise the noise experience at residential receivers.

General Coastal Marine Zone

The objectives and policies within F2.2.2 and F2.2.3 discourage reclamation and drainage of the CMA unless it is required for infrastructure, including pipelines, and operation of regionally significant infrastructure. As noted above, the works within and adjacent to the CMA are required in order to widen the existing access road and to allow for the installation of the new pipeline to connect to the WWTP. The drainage and reclamation (associated with the installation of the culvert) are considered to be reduced to the extent necessary to accommodate these works, which is considered to be a relatively small area of the CMA.

With regard to foreshore and seabed disturbance, the provisions of F2.5.2 and F2.5.3 recognise that works which cause temporary disturbance and which can be remedied by tidal and wave processes are acceptable, particularly that associated with infrastructure. As previously noted, sediment disturbance will be avoided where possible through locating machinery on land. Where excavation is not possible from land, a single excavator may be used on the foreshore/seabed while the cofferdam is in place in addition to racking mats to minimise disturbance.

Mangrove removal is addressed in under F2.7.2 and 2.7.3. These provisions recognise the contribution mangroves make to coastal character, coastal ecology and coastal hazard mitigation. While generally discouraged within SEA's, as with the other provisions, some removal of mangroves is provided for where the removal facilitates operation and maintenance of infrastructure. While some concern was raised over the potential loss of threatened lichen species which are present on mangroves, Council's ecologist has accepted that the overall scale of removal is relatively small and mitigation measures are limited. Best practice methods for mangrove removal have been recommended and agreed to as part of the conditions, which will include hand removal to avoid additional sediment disturbance.

Conclusion

While I note that the proposal is not fully consistent with the objectives and policies relating to freshwater and retention of stream values, the proposal is considered to be largely consistent with the remainder of the AUP(OP) provisions, and is therefore partly consistent overall.

12. Any other matter – section 104(1)(c)

No other matters are considered relevant to the assessment of this consent under s104(1)(c).

13. Other relevant RMA sections

Duration of resource consents – s123

A 35 year term of consent has been recommended for the culvert structures within the riverbed and for the dewatering and diversion of groundwater.

14. Part 2 (Purpose and Principles)

Section 5 sets out the purpose of the RMA, and requires a broad judgement as to whether a proposal would promote the sustainable management of natural and physical resources. This exercise of this judgement is informed by the principles in sections 6 to 8, and considered in light of the particular circumstances of each application.

In this case, it is considered that there is no need to look into Part 2 of the RMA in making this decision, as the objectives and policies of the relevant statutory documents were prepared having regard to Part 2 of the RMA and they have captured all relevant planning considerations. They also contain a coherent set of policies designed to achieve clear environmental outcomes and provide a clear framework for assessing all relevant actual and potential effects. An assessment against Part 2 is not considered to add anything further to the evaluative exercise.

15. Conclusion

Overall the proposed works will allow for the construction of much needed infrastructure, being the wastewater conveyance pipeline, which will provide for the social wellbeing, health and safety of the community, and will provide for future wastewater capacity for an area which is experiencing rapid growth. The adverse effects from the proposal will be adequately mitigated through the use of various management plans, which will be certified by Council prior to works commencing. Provided these measures are implemented and monitored where applicable, the resulting effects are considered to be comparable to those experienced from other infrastructure enabling works, and acceptable overall.

16. Recommendation

Under sections 104D, 104, 105, and 107 and Part 2 of the RMA, I recommend that these non-notified non-complying activity applications are granted, subject to the following conditions.

The reasons for this decision are detailed in the attached draft decision and recommended conditions.

This report and recommendation prepared by:

Name: Sarah Saxon

Title: Intermediate Planner, Resource Consents

Signed:



Date: 24/07/2019

Decision on an application for resource consent under the Resource Management Act 1991



Discretionary activity

Application numbers: BUN60330590
WAT60330596
LUC60330594
LUS60331447
CST60342608

Applicant: Watercare Services Limited

Site address: Multiple (refer to Appendix A)

Legal description: Multiple (refer to Appendix A)

Proposal:

The proposal is for the construction and operation of an 8km long wastewater conveyance pipeline. The pipeline will transfer wastewater flows via 3 new pump stations from Warkworth to the new Snells Beach Sub-Regional Wastewater Treatment Plant (WWTP). Consent is required for construction related activities, which relate to the installation of the pipeline, as well as upgrades to the existing access road to the Snells Beach WWTP.

These works include:

- Removal of up to 17 protected trees within Lucy Moore Memorial Park and up to 5 protected trees on road reserve
- Alteration/trimming of 9 trees within Lucy Moore Memorial Park
- Earthworks of approximately 30,610m³ over a total area of approximately 17,340m²
- Removal of approximately 2180m² of vegetation within the Significant Ecological Area Overlays
- Removal of approximately 780m² of riparian vegetation
- Reclamation of approximately 922m² m of mangrove forest
- Reclamation of 110m of intermittent stream
- Replacement and upgrades to culverts beneath the existing access road

The resource consents required are:

Land use consents (s9) – LUC60330594

Auckland Unitary Plan (Operative in part)

Taking, using, damming and diversion of water and drilling

- To undertake diversion and dewatering of groundwater caused by excavation that doesn't comply with the permitted activity standards, as a **restricted discretionary activity** under E7.4.1(A20) and (A28).
The works will involve dewatering over more than 30 days, will extend below groundwater level and more than 6m below ground level and will physically impede the flow of groundwater over a length of more than 20m and extend more than 2m below the natural groundwater level.
- To replace an existing bore which does not meet the permitted activity standards as a **restricted discretionary activity** under E7.4.1(A42).
Dependent on the final alignment of the wastewater conveyance pipeline, an existing bore within 198 Sandspit Road may require decommissioning and replacement. The new bore location may not be able to be within 10m of the existing bore.

Infrastructure

- To undertake vegetation removal within the SEA overlay that does not comply with Standards E26.3.5.1 to E26.3.5.4 as a **restricted discretionary activity** under E26.3.3.1(A77).
The proposal will require minor pruning and removal of 1400m² of vegetation within the SEA_T_3731 overlay and removal of 780m² of riparian vegetation within the SEA. 564m² of vegetation removal is required around the western most culvert. The vegetation removal is required to widen the existing WWTP access road located at the end of Hamatana Road.
- To undertake tree trimming and pruning that does not comply with Standard E26.4.5.1 as a **restricted discretionary activity** under E26.4.3.1(A84).
The proposal requires pruning of approximately 9 trees within Lucy Memorial Park that will not comply with the standards.
- To undertake works within the protected root zone not otherwise provided for as a **restricted discretionary activity** under E26.4.3.1(A88).
The proposal will require excavation within the protected root zone of several trees within Lucy Moore Memorial Park and Sandspit Road.
- To remove trees greater than 4m in height and/or 400mm in girth as a **restricted discretionary activity** under E26.4.3.1(A92).
The proposal requires the removal of approximately 17 trees within Lucy Moore Memorial Park and one tree within the road reserve (Sandspit Road). Dependent on the final design, a further two trees within the park and

adjacent to the outlet may be required for removal, and approximately six trees within the road reserve adjacent to 265 Sandspit Road.

- To undertake more than 2500m² and more than 2500m³ of earthworks within the Rural Countryside Living Zone as a **restricted discretionary activity** under E26.5.3.1(A97) and (A97A).
The proposal will require 10,750m³ of works over an area of 8540m².
- To undertake more than 2500m² of earthworks where the land has a slope equal to or greater than 10 degrees as a **restricted discretionary activity** under E26.5.3.2(A106).
Approximately 7600 m² of earthworks are proposed at DPSA1 and DPSA2 on land with a slope of greater than 10 degrees.
- To undertake more than 2500m² of earthworks in a sediment control protection area as a **restricted discretionary activity** under E26.5.3.2(A107).
Approximately 4100 m² of earthworks are proposed at DPSA1 which is within the sediment control protection area.
- To undertake earthworks from 10m² to 2500m² and from 5m³ to 2500m³ within the High Natural Character Overlay and Outstanding Natural Landscapes Overlay as a **restricted discretionary activity** under E26.6.3.1(A117).
Earthworks may be required for an intermediate shaft site if pipe jacking is chosen as the method for crossing beneath the Mahurangi River, and will be located within the grassed area of 198 Sandspit Road.
- To undertake earthworks which are a restricted discretionary, and do not comply with the relevant standards under E26.5.5.2, as a **restricted discretionary activity** under C1.9(2).
The proposed earthworks include filling within a 1% AEP floodplain of more than 10m³ at DPSA1 and at the private access road, and more than 10m² of earthworks within the riparian and coastal protection yards which relate to the installation of new network utilities (pipeline and pump stations). .

Natural Hazards and Flooding

- To construct the new pipeline within the 1% AEP floodplain as a **restricted discretionary activity** under E36.4.1(A56).
The proposed pipeline will be located within the 1% AEP floodplain within Lucy Moore Memorial Park, at several spots along Sandspit Road and at Hamatana Road.

Noise and Vibration

- To undertake construction activities which do not comply with the permitted activity standards, as **restricted discretionary activity** under E25.4.1(A2).

Some construction activities associated with both trenchless and trenched pipeline installation will exceed the 70dB limits for works within the road and within 30m of unscreened residential receivers.

Stream works consent (s13) – LUS60331447

- To undertake mangrove removal which is not otherwise provided for, within the SEA overlay as a **discretionary activity** under E3.4.1(A17).
The proposal will require the removal of approximately 1000m² of mangrove and scrubs on the northern side of the access road and approximately 730m² of mangrove and scrub on the southern side of the access road.
- To replace an existing culvert which is located within the SEA overlay which complies with E3.6.1.12 as a **restricted discretionary activity** under E3.4.1(A23).
The proposal will replace the existing culverts beneath the private access road.
- To install new culverts measuring less than 30m in length and located within the SEA overlay as a **discretionary activity** under E3.4.1(A32).
- To extend an existing lawful reclamation located in the SEA overlay as a **non-complying activity** under E3.4.1(A48).
The widening of the existing WWTP access road requires additional reclamation of approximately 1326m² adjacent to Culvert A and B, which are located in the SEA-T and SEA-M overlays.
- To undertake a new reclamation as a **non-complying activity** under E3.4.1(A49).
The earthworks required for the DPSA1 will result in reclamation of approximately 110m of intermittent stream.

Coastal Permit (s12) – CST60342608

- To undertake works which result in up to 1500m³ of sediment disturbance within in the same coastal cell, and within the SEA-M1 as a **discretionary activity** under F2.19.4(A33).
The proposed works will include approximately 159m³ of disturbance within the coastal marine area associated with the mangrove removal and installation of the new culverts for the upgrade of the private access road.
- To undertake native vegetation alteration or removal not otherwise provided for within the SEA-M1 overlay as a **non-complying activity** under F2.19.4(A42).
The proposal will require removal of approximately 730m² of native mangrove and scrub for the installation of the new culverts.

- To divert coastal water within the SEA-M1 overlay other than for the operational needs of vessels and firefighting as a **discretionary activity** under F2.19.6(A55).
The proposal will involve diversion of coastal water during the installation of the culverts by two cofferdams (installed and used at one at a time) to allow for a dry area for works to occur.
- To use vehicles on the foreshore and seabed, within an SEA-M1 overlay, by network utility operators for the construction of new infrastructure as a **discretionary activity** under F2.19.8(A99).
Where possible, the installation of culverts and the cofferdams, associated with the road widening and pipeline installation, will be undertaken by a excavator and crane from the road, however a small excavator may be required to enter the foreshore and seabed area to removal material which cannot be reached from the road.

Consents applied for but not required

The applicant has applied to undertake more than 2500m² and 2500m³ of earthworks within an SEA Overlay as a **discretionary activity** under E26.6.3.1(A118). Upon further assessment, it is considered that consent under this rule is not required, as the total area of earthworks within the SEA overlay adjacent to the private access road is approximately 1400m².

Decision

I have read the application, supporting documents, and the report and recommendations on the application for resource consents. I am satisfied that I have adequate information to consider the matters required by the Resource Management Act 1991 (RMA) and make a decision under delegated authority on the application.

Acting under delegated authority, under sections 104, 104D, 105 and 107 and Part 2 of the RMA, the resource consents are **GRANTED**.

Reasons

The reasons for this decision are:

1. In accordance with an assessment under ss104(1)(a) and (ab) of the RMA, the actual and potential effects from the proposal are found to be acceptable, because:
 - a. While detailed plans for the culverts at the private access road are yet to be confirmed, the applicant has provided detailed design requirements as a condition of consent, such that that these will be certified by Council once the design is finalised. This condition is considered to be sufficient to ensure that the design is to Council best practice, with provision for fish passage, flood flows and scour prevention.

- b. The works occurring around the culvert, including the filling within the coastal marine area and stream will be undertaken in accordance with GD05 Council's best practice erosion and sediment control methods, to ensure that sediment laden runoff from the works is minimised where possible. A certified final ESCP will also detail the mitigation methods for works at DPSA1 and DPSA2 which are in proximity to streams, and if implemented correctly are considered to result in minimal effects on the stream quality.
 - c. The reclamation of the stream at DPSA1 is unable to be avoided in this instance, and to date offsite mitigation locations have not been secured, in order to provide a full assessment of the stream loss and any offset enhancement. The applicant has proposed a condition of consent that this be found within 6 months of the consent being granted, or at a ratio of at least 1:1 should no suitable site be found. Given the relatively low stream values at present, it is considered that this condition will be suitable to offset the loss of stream values on site.
 - d. The proposed tree removals within the park and road reserve will not compromise the overall amenity, naturalness and openness of the park and road areas. Replacement planting will take place at a 1:1 ratio with large grade trees (PB95) immediately following construction of the pipeline.
 - e. The removal of vegetation around the private access road will be small in scale and is necessary to allow for the installation of the pipeline, as well as future maintenance and operation of the WWTP. The removed planting will be mitigated through native revegetation planting following the completion of works. While important to the ecological values of the area, the mangroves and riparian planting is not considered to be important to the coastal character of the area.
 - f. The infringement of noise levels in proximity to residential receivers will be mitigated through the use of screening, limiting hours of works and advance notice. The works will be largely temporary given the linear nature of the works, and it is also considered that some noise and vibration is reasonably expected for large scale infrastructure works.
 - g. Works within the coastal marine area and associated bed disturbance will be minor and will be avoided where possible through use of machinery on land.
2. In accordance with an assessment under s104(1)(b) of the RMA, the proposal is found to be mostly consistent with the relevant statutory documents, including the NPS:FM, NZCPS, RPS and AUP(OP).

I note that the provisions of the AUP(OP) and RPS must be consistent with higher level policy (NZCPS and NPS) and are particularly enabling of infrastructure and the works associated with construction, operation and maintenance of regionally significant infrastructure. These provisions recognise the public good that wastewater infrastructure provides in

enabling growth of urban areas and the health and safety of communities. It is also recognised that certain areas and works within these areas cannot be avoided, including in streams, significant ecological areas and within the coastal environment. Where these works cannot be avoided, it is anticipated that suitable mitigation or offset (where appropriate) is provided. In this case mitigation for most works is provided, and where not available, conditions of consent have been agreed to, which enable the applicant to provide further detail for certification prior to construction.

3. In accordance with an assessment under s104(1)(c) of the RMA no other matters were considered relevant or reasonably necessary to determine the applications.
4. As the proposal meets the s104D gateway test, there is no prohibition under s104D on granting these resource consents.
5. There is no need to look to Part 2 of the RMA in making this decision, as the objectives and policies of the relevant statutory documents were prepared having regard to Part 2 of the RMA and they have captured all relevant planning considerations. They also contain a coherent set of policies designed to achieve clear environmental outcomes and provide a clear framework for assessing all relevant actual and potential effects. An assessment against Part 2 would not add anything to the evaluative exercise
6. Overall the proposed works will allow for the construction of much needed infrastructure, being the wastewater conveyance pipeline, which will provide for the social wellbeing, health and safety of the community, and will provide for future wastewater capacity for an area which is experiencing rapid growth. The adverse effects from the proposal will be adequately mitigated through the use of various management plans, which will be certified by Council prior to works commencing. Provided these measures are implemented and monitored where applicable, the resulting effects are considered to be comparable to those experienced from other infrastructure enabling works, and acceptable overall.

Conditions

Under sections 108 and 108AA of the RMA, this consent is subject to the following conditions:

General conditions

These conditions apply to all resource consents.

1. The following conditions are to be read in addition to those which have been granted for consents LAN-67900, REG-67901, REG-67903, REG-67905, REG-67908, REG-67909, REG-67911, REG-67912, REG-67915, REG-67916, LAN-67917 and REG-6791 which authorise the use of three wastewater pump stations, wastewater outfall, discharges to land from overflows, air discharge and construction related activities for the outfall.

2. Except as modified by the conditions below, and subject to final design, the works for the conveyance pipeline and private access road upgrade shall be carried out in accordance with the documents and drawings and all supporting additional information submitted with the application, below, and all material referenced by the Council as resource consent numbers BUN60330590, LUC60330594, WAT60330596, LUS60331447 and CST60342608.
 - Application Form, and Assessment of Effects prepared by Megan Couture of Beca, dated 15 November 2018;
 - information submitted with the application and listed in **Appendix C**; or
 - Any subsequent plans that receive certification from Team Leader – Compliance Monitoring NW1
3. In the event of inconsistency between the plans and documents referred to in Condition 1 and the conditions of this consent, the conditions shall prevail.
4. Any certified Management Plan may be amended if necessary to reflect any minor changes in design, construction methods or management of effects. Any amendments are to be discussed with and submitted to the Team Leader – Compliance Monitoring NW1 for confirmation in writing prior to implementation of the change, unless the Team Leader – Compliance Monitoring NW1 determines in his or her discretion that those amendments once implemented would result in a materially different outcome to that described in the original plan.

Duration, lapse and expiry of consents

5. Under section 125 of the RMA, this consent lapses five years after the date it is granted unless:
 - a. The consent is given effect to; or
 - b. The council extends the period after which the consent lapses.
6. The take (dewatering) and groundwater diversion consent WAT60330596 shall expire 35 years from the date it is granted unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

The streamworks consent for the installation of the culverts within the river bed and reclamation of the stream LUS60331447 shall expire 35 years from the date it is granted unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

Monitoring charges

7. The consent holder shall pay the council an initial consent compliance monitoring charge of \$990 (inclusive of GST), plus any further monitoring charge or charges to recover the actual and reasonable costs incurred to ensure compliance with the conditions attached to 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 to ensure compliance with the resource consent. In order to recover actual and reasonable costs, monitoring of conditions, in excess of those covered by the deposit, shall be charged at the relevant hourly rate applicable at the time. The consent holder will be advised of the further monitoring charge. Only after all conditions of the resource consent have been met, will the council issue a letter confirming compliance on request of the consent holder.

Specific conditions – land use consent LUC60330594

Pre-commencement Meeting

8. Prior to the commencement of earthworks (at DPWWS, DPSA1, DPSA2 and Hamatana Road widening), the consent holder shall hold a pre-start meeting that:
 - (a) is located on the subject site
 - (b) is scheduled not less than five days before the anticipated commencement of earthworks
 - (c) includes Auckland Council officer(s)
 - (d) includes representation from the contractors who will undertake the works

The meeting shall discuss the erosion and sediment control measures, the earthworks methodology and shall ensure all relevant parties are aware of and familiar with the necessary conditions of this consent.

The following information shall be made available at the pre-start meeting:

- (e) Timeframes for key stages of the works authorised under this consent,
- (f) Resource consent conditions,
- (g) The finalised Erosion and Sediment Control Plans,
- (h) Final Streamworks and Coastal Management Plan, and
- (i) Final culvert designs.

Advice Note: *To arrange the pre-start meeting please contact the Team Leader - Compliance Monitoring NW1 to arrange this meeting on monitoring@aucklandcouncilgovt.nz, or 09 301 01 01. The conditions of consent should be discussed at this meeting. All additional information required by the Council should be provided 2 days prior to the meeting.*

Erosion and Sediment Control

9. Prior to the commencement of earthworks for DPWWS, DPSA1 and DPSA2 a finalised Erosion and Sediment Control Plan (ESCP) shall be prepared in accordance with Auckland Council's Guideline Document 2016/005 Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05) including, but not limited to:
- (a) specific erosion and sediment control works (location, dimensions, capacity) in accordance with GD05;
 - (b) supporting calculations and design drawings;
 - (c) details of construction methods;
 - (d) monitoring and maintenance requirements;
 - (e) catchment boundaries and contour information;
 - (f) details relating to the management of exposed areas (e.g. grassing, mulching).

This finalised ESCP shall be submitted to the Team Leader – Compliance Monitoring NW1 on monitoring@aucklandcouncil.govt.nz. No earthworks activity on the subject site shall commence until confirmation from council is provided that the ESCP is satisfactory.

Advice Note: *In the event that minor amendments to the erosion and / or sediment controls are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance of the controls may require an application to be made in accordance with section 127 of the RMA. Any minor amendments should be provided to the Team Leader Compliance Monitoring NW1 prior to implementation to confirm that they are within the scope of this consent.*

10. Within twenty (20) working days prior to the commencement of the earthworks activity for each site (referenced in Condition 5), a certificate signed by a suitably qualified and experienced person shall be submitted to the Team Leader - Compliance Monitoring NW1, to certify that the erosion and sediment controls relating to the earthworks activity have been constructed in accordance with the certified erosion and sediment control plan. If no response is received from Council within this twenty (20) working day period, the measures will be considered as certified.
11. The operational effectiveness and efficiency of all erosion and sediment control measures specifically required by the certified ESCP shall be maintained throughout the duration of earthworks activities, or until each site is permanently stabilised against erosion.
12. Earthworks shall be undertaken to avoid deposition of earth, mud, dirt or other debris on any road or footpath resulting from the earthworks activity on the subject site. In the event that such deposition does occur, it shall

immediately be removed. In no instance shall roads or footpaths be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses or receiving waters.

Advice Note: *In order to prevent sediment laden water entering waterways from the road, the following methods may be adopted to prevent, or address discharges should they occur:*

- o provision of a stabilised entry and exit(s) point for vehicles*
- o provision of wheel wash facilities*
- o ceasing of vehicle movement until materials are removed*
- o cleaning of road surfaces using street-sweepers*
- o silt and sediment traps*
- o catchpit protection*

In no circumstances should the washing of 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 Team Leader - Compliance Monitoring NW1 for more details. Alternatively, please refer to Auckland Council Guideline Document GD05, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region.

13. Earthworks shall be progressively stabilised against erosion at all stages of the earthworks activities and shall be sequenced to minimise the discharge of sediment to surface water.

Advice Note: *Interim stabilisation measures may include:*

- o the use of waterproof covers, geotextiles, or mulching*
- o top-soiling and grassing of otherwise bare areas of earth*
- o aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward*

14. Upon completion or abandonment of earthworks on the subject site, all areas of bare earth shall be permanently stabilised against erosion to the satisfaction of the Team Leader - Compliance Monitoring NW1.

Advice Note: *Should the earthworks be completed or abandoned, bare areas of earth shall be permanently stabilised against erosion. Measures may include:*

- o the use of mulching;*
- o top-soiling, grassing and mulching of otherwise bare areas of earth;*

o aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward

The on-going monitoring of these measures is the responsibility of the consent holder.

15. No earthworks on the site shall be undertaken at DPWWS, DPSA1 or DPSA2 between 30 April and 1 October in any year, without the prior written approval of the Team Leader Compliance Monitoring NW1 at least two weeks prior to 30 April. Revegetation/stabilisation is to be completed by 30 April in accordance with measures detailed in GD05 and any amendments to this document.

Avifauna management

16. Should the vegetation clearance required for the private access road upgrade occur within the main native bird nesting season (early September until the end of February) an approved and experienced ecologist or ornithologist shall visually inspect all trees and shrubs, mangrove forest and scrub particularly areas of rushes along the estuarine edge proposed for removal within 24 hours of undertaking vegetation removal to identify any active nests.

Should any nesting be observed, the following measures shall be implemented:

- (a) Appropriate set-back (buffer) area around the nest and surrounding vegetation shall be fenced off for the duration of construction (as specified by the ecologist or ornithologist;
- (b) For works outside this set-back (buffer) area, construction methods should be amended to reduce possible disturbance until chicks are fledged

The purpose of these measures is to minimise any disturbance risk that vegetation removal would have on nesting birds.

Advice Note: *This condition applies to the area surrounding the private access road upgrade. Almost all native bird species are protected under the Wildlife Act 1953. It is an offence to deliberately disturb or destroy them, their eggs or nests.*

Mangrove Removal

17. Mangrove removal shall be in accordance with the NIWA Guidelines for Managing Mangroves (Mānawa) Expansion in New Zealand. All vegetation shall be disposed of outside of the coastal marine area.

Advice note: *The NIWA Guidelines for managing mangroves are: Lundquist, C., Carter, K., Hailes, S., Bulmer, R. (2017) Guidelines for Managing Mangroves (Mānawa) Expansion in New Zealand. NIWA Information Series No. 85. National Institute of Water & Atmospheric*

Revegetation Planting (Private Access Road Upgrade)

18. Within the first planting season (May to September) following completion of works, revegetation planting shall be implemented in the areas identified in the approved Ecological Planting Plans (Warkworth to Snells Transfer Pipeline Hamatana Road Ecological Planting Drawing number 3254607-LA-001). Planting undertaken shall be in accordance with the plant schedules of the approved Ecological Planting Plans (Warkworth to Snells Transfer Pipeline Hamatana Road Ecological Planting Drawing number 3254607-LA-002). All plants shall be eco-sourced from the Rodney Ecological District. Following completion of the required planting in accordance with the approved Ecological Planting Plans the consent holder shall submit a completion report to the Team Leader – Compliance Monitoring NW1 for certification. Any pest plants present in the planting area shall be controlled prior to planting.

Advice note: *Should any Myrtaceae species be used in replanting, a signed Myrtle Rust Nursery Management Declaration (dated 11 October 2017 or subsequent versions) that certifies that the plant producer has implemented the New Zealand Plant Producers Incorporated Myrtle Rust Nursery Management Protocol (v6 11 October 2017 or subsequent versions) must be obtained by the consent holder. A copy of the declaration must be provided to the Team Leader – Compliance Monitoring NW1 within 5 days of being obtained. The New Zealand Plant Producers Incorporated has developed a framework of supply chain biosecurity protocols that will satisfy the above condition. A copy of the Myrtle Rust Nursery Management Declaration and the New Zealand Plant Producers Incorporated Myrtle Rust Nursery Management Protocol can be found at the website (<http://nzppi.co.nz/>). The website explains that a declaration signed by the plant provider will be proof that any Myrtaceae species have been grown and treated according to best practice protocols to reduce the spread of Myrtle rust.*

19. The consent holder shall maintain the re-vegetation planting with weed control as well as replacement planting, in the event of plant loss, for a minimum of five years or until 80% canopy closure, whichever is achieved sooner.
20. The consent holder shall carry out pest plant management in accordance with the certified Weed Control Plan referred to in Condition 1 to the satisfaction of the Team Leader – Compliance Monitoring NW1 for a minimum of five years.

Advice note: *All pest plant species as listed in the Auckland Regional Pest Management Strategy 2007-2012 (RPMS) or subsequent versions shall be controlled on the subject site.*

Tree Protection

21. The consent holder shall identify to Council's Community Facilities Arboriculture Advisor an Appointed Supervisory (Works) Arborist to be engaged by the consent holder to advise upon and supervise the tree protection measures required to ensure that the works have no more than a minor adverse impact upon all retained trees in the Council Road Reserve associated with the works.
22. All efforts shall be made to retain Tree No. 44 – Box Elder (*Acer negundo*). This tree is one of three large established elder trees along pond bank and is considered a high value amenity specimen tree.
23. Within 1 month following works completion, a brief works memo shall be supplied (with accompanying images of any root pruning) to the Auckland Council Senior Arboriculture and Ecological Specialist.
24. All proposed tree removals, tree pruning, and excavation within the rootzone of protected trees shall be undertaken in accordance with the recommendations listed in the Greenscene NZ Arboricultural Assessment titled "NE Wastewater Conveyance, Warkworth to Snells WWTP Transfer Pipe", dated 14 November 2018 and attached as Appendix D. All works in the rootzone of retained trees shall be undertaken in strict adherence to the tree protection methodologies supplied in Sections 5 and 6 of the above referenced arboricultural assessment. A copy of this assessment shall be held onsite at all times throughout the duration of the works.

Advice Note: *The applicant is advised that the removal of all trees on private land, as approved by this consent cannot commence until landowner approval has been granted for access to and removal of the trees on these sites.*

25. Replacement planting for the tree removal within Lucy Moore Memorial Park (as per the arboricultural report in Appendix C) shall be replaced on a 1:1 PB95 grade basis.

Construction noise and vibration

26. Noise from demolition and construction activities shall comply with, and be measured and assessed in accordance with New Zealand Standard NZS 6803:1999 "Acoustics – Construction Noise".
27. Unless otherwise addressed by the Construction Noise and Vibration Management Plan (CNVMP) in Condition 28 below, any noise from demolition and construction activities shall comply with the noise criteria set out in the following tables:

Time of week	Time Period	Maximum noise level (dBA)	
		L _{eq}	L _{max}
Weekdays	6:30am - 7:30am	60	75
	7:30am - 6:00pm	75	90
	6:00pm - 8:00pm	70	85
	8:00pm - 6:30am	45	75
Saturdays	6:30am - 7:30am	45	75
	7:30am - 6:00pm	75	90
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75
Sundays and public holidays	6:30am - 7:30am	45	75
	7:30am - 6:00pm	55	85
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75

Table 1: Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone

Time Period	Maximum noise levels Leq dBA
7:30am – 6:00pm	75
6:00pm – 7:30am	80

Table 2: Construction noise levels for noise affecting any other activity

28. A CNVMP shall be prepared and submitted to Council for certification prior to works commencing. The CNVMP shall be in general accordance with Annex E of NZS 6803:1999. The objective of the CNVMP is to provide a framework for the development and implementation of Best Practicable Option for the management of construction noise effects, and to minimise any exceedance of the construction noise criteria set out in Condition 26 above.

The CNVMP should contain, but not be limited to:

- A summary of the project noise criteria
- A summary of construction noise assessments/predictions
- General construction practices, management and mitigation
- Noise management and mitigation measures specific to activities and/or receiving environments and in particular, consideration of screening for secant piling and other noisy works, in particular fixed items of plant.
- The requirement for pre and post-construction building condition surveys particularly where vibration from trench excavation, piling and vibratory rollers may be used within 15m from dwellings
- Monitoring and reporting requirements
- Procedures for handling complaints
- Procedures for review of the CNVMP throughout the project

29. Vibration monitoring shall be undertaken at representative locations during activities with potentially high levels of vibration.

Engineering plans

30. The engineering works required by this consent shall comply with Council Standards as may be amended from time to time. Engineering Plans, as specified in the Standards, shall be submitted to the Development Engineer, and approval thereto received in writing, prior to the commencement of any works on the site.

Any variation or changes to the approved engineering plans shall be submitted for approval as an Amendment and approval received thereto prior to construction of the varied works.

The term 'engineering works' includes, but is not limited to the private access road upgrade to the Snells Beach Wastewater Treatment Plant.

Advice Note: *Structures such as retaining walls, in-ground walls and bridges will require a separate Building Consent. The plans required under this condition are separate to, and do not form part of, any Building Consent that may be required on the subject site.*

Pre-construction meeting

31. The Developer's Representative shall give the development engineer named in the engineering plan approval at least 5 working days' notice of the on-site pre-construction site meeting. Construction work shall not commence on the site until such meeting has been held and all necessary documentation presented.

Advice note: *Attention is drawn for the following documentation to be presented at the preconstruction meeting:*

- *Approved engineering plans and copy of approval letter;*
- *Health and Safety Plan;*
- *The Signed Corridor Access Request;*
- *The relevant Resource or Subdivision Consent (and all conditions attached thereto);*
- *Signed copies of all Consents to Enter for Construction for works on land (including Council land) not owned by the consent holder.*

Construction of Private Way

32. The shared private way over parts of Lots 5 -7 DP 193583, Lot 3 DP 193583 and Lot 5 DP 518302 (the shared access way from Hamatana Road to the Snells Beach Wastewater Treatment Plant) shall be constructed, at a minimum, to meet standard to the requirements of Auckland Council Standards. The crossing, the first 10m and any sections greater than 1:8 shall be formed to a concrete standard.

Earthworks Design

33. All earthworks shall be specifically designed to Auckland Council Standards, including 'Auckland Council Code of Practice for Land Development and Subdivision' and NZS 4431 by a Chartered Professional Engineer experienced in soil mechanics. The work shall be designed and executed in compliance with the recommendations contained in the Geotech Report prepared by: Tonkin & Taylor, ref: 1005254.1000.v3, dated: November 2018, and any subsequent reports.

Earthworks Certification

34. On completion of earthworks, an Earthworks Completion Report and a Certificate in the form of Schedule 2A of the 'Auckland Council Code of Practice for Land Development and Subdivision' signed by the Chartered Professional Engineer who designed and supervised the works shall be provided to the Consents Engineer. The completion report shall confirm the recommendations contain within the Geotech Report prepared by: Tonkin & Taylor, ref: 1005254.1000.v3, dated: November 2018, and any subsequent reports, have been met.

Specific conditions – groundwater diversion and dewatering WAT60330596

Definitions

Words in the ground dewatering (take) and groundwater diversion consent conditions have specific meanings as outlined in the table below.

Alarm Level	Specific levels at which actions are required as described in the relevant conditions.
Alert Level	Specific levels at which actions are required as described in the relevant conditions.
Bulk Excavation	Includes all excavation that affects groundwater excluding minor enabling works and piling less than 1.5m in diameter.
Commencement of Dewatering	Means commencement of Bulk Excavation and/or the commencement of the taking of any groundwater from the tunnel, trench or shaft excavation and/or any dewatering prior to excavation.

Completion of Dewatering	Means, in the case of tunnels and shafts, when the tunnel and shafts have been constructed and effectively no further groundwater is being taken/diverted for the construction of the tunnel and shafts in accordance with the design.
	Means, in the case of pipe infrastructure, the stage when all pipework and pipe seals (and where required trench stops (collars) have been installed and all back filling is completed within 50 metres of a building or structure and effectively no further groundwater is being taken for the construction of the network at that location.
Commencement of Excavation	Means commencement of Bulk Excavation for shafts, trenches and tunnel.
Completion of Construction	Means when the Code Compliance Certificate (CCC) is issued by Auckland Council
Completion of Excavation	Means the stage when all Bulk Excavation has been completed and all foundation/footing excavations within 10 meters of the perimeter retaining wall have been completed.
Condition Survey	Means an external visual inspection or a detailed condition survey (as defined in the relevant conditions).
Damage	Includes Aesthetic, Serviceability, Stability, but does not include Negligible Damage. Damage as described in the table below.
External visual inspection	A condition survey undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage. Includes as a minimum a visual inspection of the exterior and a dated photographic record of all observable exterior Damage.
GSMCP	Means Groundwater and Settlement Monitoring and Contingency Plan
Monitoring Station	Means any monitoring instrument including a ground or building deformation station, inclinometer, groundwater monitoring bore, retaining wall deflection station, or other monitoring device required by this consent.
RL	Means Reduced Level.
Seasonal Low Groundwater Level	Means the annual lowest groundwater level – which typically occurs in summer.
Services	Include fibre optic cables, sanitary drainage, stormwater drainage, gas and water mains, power and telephone installations and infrastructure, road infrastructure assets such as footpaths, kerbs, catch-pits, pavements and street furniture.

SQEP

Means Suitably Qualified Engineering Professional

SQBS

Means Suitably Qualified Building Surveyor

Category of Damage	Normal Degree of Severity	Description of Typical Damage <i>(Building Damage Classification after Burland (1995), and Mair et al (1996))</i>	General Category <i>(after Burland – 1995)</i>
0	Negligible	Hairline cracks.	Aesthetic Damage
1	Very Slight	Fine cracks easily treated during normal redecoration. Perhaps isolated slight fracture in building. Cracks in exterior visible upon close inspection. Typical crack widths up to 1 mm.	
2	Slight	Cracks easily filled. Redecoration probably required. Several slight fractures inside building. Exterior cracks visible, some repainting may be required for weather-tightness. Doors and windows may stick slightly. Typically crack widths up to 5mm.	
3	Moderate	Cracks may require cutting out and patching. Recurrent cracks can be masked by suitable linings. Brick pointing and possible replacement of a small amount of exterior brickwork may be required. Doors and windows sticking. Utility services may be interrupted. Weather tightness often impaired. Typical crack widths are 5mm to 15mm or several greater than 3mm.	Serviceability Damage
4	Severe	Extensive repair involving removal and replacement of walls especially over door and windows required. Window and door frames distorted. Floor slopes noticeably. Walls lean or bulge noticeably. Some loss of bearing in beams. Utility services disrupted. Typical crack widths are 15mm to 25mm but also depend on the number of cracks.	Stability Damage
5	Very Severe	Major repair required involving partial or complete reconstruction. Beams lose bearing, walls lean badly and require shoring. Windows broken by distortion. Danger of instability. Typical crack widths are greater than 25mm but depend on the number of cracks.	

Table 1: Building Damage Classification

Note: In the table above the column headed “Description of Typical Damage” applies to masonry buildings only and the column headed “General Category” applies to all buildings.

Review Under Section 128

35. Under section 128 of the RMA the conditions of this consent WAT60330596 may be reviewed by the Manager Resource Consents at the Consent Holder’s cost:
36. At intervals of not less than one year following Commencement of Dewatering to vary the monitoring and reporting requirements, and performance standards, in order to take account of information, including the results of previous monitoring and changed environmental knowledge on:
 - ground conditions
 - aquifer parameters

- groundwater levels; and
- ground surface movement

Notice of commencement of dewatering

37. The Team Leader - Compliance Monitoring NW1 shall be advised in writing at least ten (10) working days prior to the date of the Commencement of Dewatering

Design of pipeline and structures

38. The design and construction of the wastewater pipeline, access shafts, manholes, pump station wet wells and emergency storage tanks shall be undertaken in accordance with the specifications contained in the reports titled “North East Conveyance – Warkworth to Snells Beach WWTP, Geotechnical Interpretative Report”, Job No. 1005254.1000.v3, prepared by Tonkin & Taylor Ltd, dated November 2018, and “North East Conveyance – Warkworth to Snells Transfer Pipeline, Groundwater Technical Assessment Report”, Job No. 1005254. 1000.v4, prepared by Tonkin & Taylor Ltd, dated November 2018.

Design of pipe jacking shaft

39. If pipe jacking is selected as the preferred trenchless methodology for the Mahurangi River crossing (from approximately chainage 427), the launch shaft known as Shaft A shall be fully sealed to prevent groundwater drawdown.

Trench stops

40. Low permeability trench stops (collars) shall be constructed along the pipeline where required by the Watercare Services Ltd Code of Practice, to best practice standard, as shown on the plans titled “Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells”, Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018.

Damage avoidance

41. All excavation, dewatering systems, retaining structures, shafts and works associated with the diversion or taking of groundwater, shall be designed, constructed and maintained so as to avoid damage to buildings, structures and Services on the site or adjacent properties, outside that considered as part of the application process unless otherwise agreed in writing with the asset owner.

Alert and alarm levels

42. The activity shall not cause any settlement or movement greater than the Alarm Level thresholds specified in Schedule A below. Alert and Alarm Levels are triggered when the following Alert and Alarm Trigger thresholds are exceeded:

Schedule A: Alarm and Alert Levels			
Movement		Trigger Thresholds (+/-)	
		Alarm	Alert
a)	Differential vertical settlement between any two Ground Surface Deformation Stations (the Differential Ground Surface Settlement Alarm or Alert Level)	1:500	1:700

b)	Total vertical settlement from the pre-excavation baseline level at any Ground Surface Deformation Station (the Total Ground Surface Settlement Alarm or Alert Level)	20mm	10mm
c)	Differential vertical settlement between any two adjacent Building Deformation Stations (the Differential Building Settlement Alarm or Alert Level)	1:500	1:700
d)	Total vertical settlement from the pre-excavation baseline level at any Building Deformation Station (the Total Building Settlement Alarm or Alert Level)	10mm	7mm
e)	Total lateral deflection from the pre-excavation baseline level at any retaining wall deflection station (the Retaining Wall Deflection Alarm or Alert Level)	20mm	15mm
f)	Distance below the pre-dewatering Seasonal Low Groundwater Level and any subsequent groundwater reading at any groundwater monitoring bore (the Groundwater Alert Levels 1 & 2)	N/A	(1) 0.5m (2) 1.0m

Advice note: The locations of the Monitoring Stations listed in Schedule A are shown on the plans titled "Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells", Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018.

These levels may be amended subject to approval by the Team Leader - Compliance Monitoring NW1 as part of the Groundwater Settlement Monitoring and Contingency Plan (GSMCP) approval process, and, after the receipt of pre-dewatering monitoring data, building condition surveys and recommendations from a suitably qualified engineering professional (SQEP), but only to the extent that avoidance of Damage to building, structures and Services can still be achieved.

There are conditions below that must be complied with when the Alert and Alarm Level triggers are exceeded. These include actions that must be taken immediately including seeking the advice of a SQEP.

Alert level actions

43. In the event of any Alert Level being exceeded the Consent Holder shall:-
- (a) Notify the Team Leader - Compliance Monitoring NW1 within 24 hours.
 - (b) Re-measure all Monitoring Stations within 30 metres of the affected monitoring location(s) to confirm the extent of apparent movement
 - (c) Ensure the data is reviewed, and advice provided, by a SQEP on the need for mitigation measures or other actions necessary to avoid further deformation. Where mitigation measures or other actions are recommended those measures shall be implemented.
 - (d) Submit a written report, prepared by the SQEP responsible for overseeing the monitoring, to the Team Leader - Compliance Monitoring NW1 within five working days of Alert Level exceedance. The report shall provide an analysis of all monitoring data (including wall deflection) relating to the exceedance, actions taken to date to address the issue, recommendations for additional monitoring (i.e. the need for increased frequency or repeat condition survey(s) of building or structures)

and recommendations for future remedial actions necessary to prevent Alarm Levels being exceeded.

- (e) Measure and record all Monitoring Stations within 50 metres of the location of any Alert Level exceedance every two days until such time the written report referred to above has been submitted to the Team Leader - Compliance Monitoring NW1.

Alarm Level Actions

- 44. In the event of any Alarm Level being exceeded at any ground deformation pin, building deformation pin or retaining wall deflection pin the Consent Holder shall:
 - (a) Immediately halt construction activity, including excavation, dewatering or any other works that may result in increased deformation, unless halting the activity is considered by a SQEP to be likely to be more harmful (in terms of effects on the environment) than continuing to carry out the activity.
 - (b) Notify the Team Leader - Compliance Monitoring NW1 within 24 hours of the Alarm Level exceedance being detected and provide details of the measurements taken.
 - (c) Undertake a condition survey (this could comprise either a detailed condition survey or an external visual inspection at the discretion of the SQEP responsible for overseeing the monitoring) by a SQEP or suitably qualified building surveyor (SQBS) of any building or structure located adjacent to any Monitoring Station where the Alarm Level has been exceeded.
 - (d) Take advice from the author of the Alert Level exceedance report (if there was one) on actions required to avoid, remedy or mitigate adverse effects on ground, buildings or structures that may occur as a result of the exceedance.
 - (e) Not resume construction activities (or any associated activities), halted in accordance with paragraph (a) above, until any mitigation measures (recommended in accordance with paragraph (d) above) have been implemented to the satisfaction of a SQEP.
 - (f) Submit a written report, prepared by the SQEP responsible for overseeing the monitoring, to the Team Leader - Compliance Monitoring NW1, on the results of the condition survey(s), the mitigation measures implemented and any remedial works and/or agreements with affected parties within five working days of recommencement of works.

Groundwater and settlement monitoring and contingency plan (GSMCP)

- 45. At least 10 days prior to the Commencement of Dewatering, a Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) prepared by a SQEP, shall be submitted to the Team Leader - Compliance Monitoring NW1 for certification written approval.

The overall objective of the GSMCP shall be to set out the practices and procedures to be adopted to ensure compliance with the consent conditions and shall include, at a minimum, the following information:

- (a) A monitoring location plan, showing the location and type of all Monitoring Stations including groundwater monitoring bores, ground and building deformation pins and

retaining wall deflection pins. The monitoring plan should be based on the plans titled "Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells", Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018. In any case where the location of a Monitoring Station differs substantively from that shown on the plans titled "Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells", Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018, a written explanation for the difference shall be provided at the same time as the GSMCP is provided.

- (b) Final completed schedules B to E (as per the conditions below) for monitoring of ground surface, building and retaining wall deformation (including any proposed changes to the monitoring frequency) as required by conditions below.
- (c) All monitoring data, the identification of Services susceptible to Damage and all building/Service condition surveys undertaken to date, and required by conditions below.
- (d) A bar chart or a schedule, showing the timing and frequency of condition surveys, visual inspections and all other monitoring required by this consent, and a sample report template for the required two monthly monitoring.
- (e) All Alert and Alarm Level Triggers (including reasons if changes to such are proposed, for example as a result of recommendations in the building condition surveys or data obtained from pre-dewatering monitoring).
- (f) Details of the contingency actions to be implemented if Alert or Alarm Levels are exceeded.
- (g) Details of the selected trenchless construction methods including locations and depths of access shafts for the pipeline sections through Lucy Moore Memorial Park and the Mahurangi River crossing.

Advice note: The GSMCP should include a summary of the groundwater level measurements and implications for Shaft design and justification for any proposed changes to alert and alarm trigger levels.

46. All construction, dewatering, monitoring and contingency actions shall be carried out in accordance with the approved GSMCP. No bulk excavation (that may affect groundwater levels) or other dewatering activities shall commence until the GSMCP is approved in writing by the Team Leader - Compliance Monitoring NW1.

Requirement for additional site investigation

47. At least two months prior to the submission of the GSMCP, at least two (2) groundwater monitoring bores are to be installed adjacent to the properties in Baxter St that will potentially be affected by groundwater drawdown associated with Shaft A, and groundwater levels measured on a weekly basis for at least two months. The groundwater monitoring bores shall have a diameter of at least 50 mm, and have a slotted screen set at appropriate depths.

Pre-dewatering building and structure survey

- 48. Prior to the Commencement of Dewatering a detailed condition survey of buildings and structures as specified in Schedule B below shall be undertaken by a SQEP or SQBS and a written report shall be prepared and reviewed by the SQEP responsible for overseeing the monitoring. The report shall be submitted for certification by the Team Leader - Compliance Monitoring NW1.
- 49. This condition does not apply where written evidence is provided to the Team Leader Compliance Monitoring NW1 that the owner of a property has confirmed they do not require a detailed condition survey.

The detailed condition survey shall include:

- (a) Confirmation of the installation of building deformation stations as required in Schedule B below in the locations shown on the Plans titled “Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells”, Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018.
- (b) A description of the type of foundations.
- (c) A description of existing levels of damage considered to be of an aesthetic or superficial nature.
- (d) A description of existing levels of damage considered to affect the serviceability of the building where visually apparent without recourse to intrusive or destructive investigation.
- (e) An assessment as to whether existing damage may or may not be associated with actual structural damage and an assessment of the susceptibility of buildings/structures to further movement and damage.
- (f) Photographic evidence of existing observable damage.
- (g) A review of proposed Alarm and Alert Levels to confirm they are appropriately set and confirmation that any ground settlement less than the Alarm Level will not cause Damage.
- (h) An assessment of whether the monitoring frequency is appropriate.
- (i) An assessment of whether the locations and density of existing building deformation stations are adequate and appropriate for the effective detection of change to building and structure condition.

Schedule B: Buildings/Structures that require Detailed Condition Survey and Installation of Deformation Stations

Schedule B: Buildings/Structures that require Detailed Condition Survey and Installation of Deformation Stations				
Number	Address	Property known as	Type of inspection	No. of building deformation stations required*

1	3 Baxter St Warkworth	Lot 1 DP 98309	Detailed condition / external visual inspection	3
2	20 Baxter St / 3 Percy St Warkworth	Lot 1 DP 77842	Detailed condition / external visual inspection	2
3	22-24 Baxter St Warkworth	Units 1 & 2 & Accessory Units 1 & 2 DP 92526	Detailed condition / external visual inspection	4
4	26-28 Baxter St / 2 Bertram St Warkworth	Lot 1 Sect B Allot 67 Parish of Mahurangi	Detailed condition / external visual inspection	3
5	5 Baxter St Warkworth (Skate ramp)	Pt Allot 4 DP 21909	External visual inspection	-
6	21 Rivendell Place Warkworth	Lot 77 DP 80663	Detailed condition / external visual inspection	2
7	23 Rivendell Place Warkworth	Lot 78 DP 80663	Detailed condition / external visual inspection	2
8	164 Mahurangi East Rd Snells Beach	Lot 71 DP 460687	Detailed condition / external visual inspection	2
9	9 Hewson Dr Snells Beach	Lot 64 DP 447067	Detailed condition / external visual inspection	2
10	198 Mahurangi East Rd Snells Beach	Lot 1 DP 56130	Detailed condition / external visual inspection	2

Advice Note: The properties listed in Schedule B and the number of monitoring points are based on the worst case scenario as shown on the plan titled "Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells, Groundwater and Settlement Monitoring – PS1 and Shaft A Option 1", Figure 2A, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018, and may change depending on the final pipeline and shaft locations and selected construction method.

Pre-dewatering services condition survey

50. Prior to the Commencement of Dewatering, a condition survey of potentially affected stormwater services shall be undertaken in consultation with the relevant service provider.

Advice note: This condition does not apply to any service where written evidence is provided to the Team Leader - Compliance Monitoring NW1 that the owner of that service as confirmed they do not require a condition survey.

51. External visual inspections of the surrounding ground and neighbouring buildings and structures shall be undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage. Inspections are to be carried out weekly from

the Commencement to Completion of Dewatering. A photographic record is to be kept, including time and date of each inspection and all observations made during the inspection, and should be of a quality that is fit for purpose.

The results of the external visual inspections and an assessment of the results are to be reviewed by the SQEP responsible for overseeing the monitoring and included in the bimonthly monitoring report for the relevant monitoring period.

Advice note: *This condition does not apply to any land, building or structure where written evidence is provided to the Team Leader - Compliance Monitoring NW1 confirming that the owner of the land, building or structure does not require visual inspections to be carried out.*

Completion of dewatering - building, structure and services condition surveys

52. Between six and twelve months after Completion of Dewatering a detailed condition survey of all previously surveyed buildings, structures, stormwater and wastewater Services, shall be undertaken by a SQEP or SQBS and a written report shall be prepared. The report is to be reviewed by the SQEP responsible for overseeing the monitoring and then submitted to the Team Leader - Compliance Monitoring NW1, within one month of completion of the survey.

The condition survey report shall make specific comment on those matters identified in the pre-dewatering condition survey. It shall also identify any new Damage that has occurred since the pre-dewatering condition survey was undertaken and provide an assessment of the likely cause of any such Damage

Advice note: *This condition does not apply to any building, structure or Service where written evidence is provided to the Team Leader - Compliance Monitoring NW1 confirming that the owner of that building, structure, or Service does not require a condition survey to be undertaken.*

Additional surveys

53. Additional condition surveys of any building, structure, or Service within the area defined by the extent of groundwater drawdown or ground movement (as defined in the reports titled "North East Conveyance – Warkworth to Snells Beach WWTP, Geotechnical Interpretative Report", Job No. 1005254.1000.v3, prepared by Tonkin & Taylor Ltd, dated November 2018, and "North East Conveyance – Warkworth to Snells Transfer Pipeline, Groundwater Technical Assessment Report", Job No. 1005254. 1000.v4, prepared by Tonkin & Taylor Ltd, dated November 2018) shall be undertaken, if requested by the Team Leader -Compliance Monitoring NW1, for the purpose of investigating any Damage potentially caused by ground movement resulting from dewatering or retaining wall deflection. A written report of the results of the survey shall be prepared and/or reviewed by the SQEP responsible for overseeing the monitoring. The report shall be submitted to the Team Leader Compliance Monitoring NW1.
54. The requirement for any such additional condition survey will cease six months after the Completion of Dewatering unless ground settlement or building deformation monitoring indicates movement is still occurring at a level that may result in Damage to buildings, structures, or Services. In such circumstances the period where additional condition surveys may be required will be extended until monitoring shows that movement has

stabilised and the risk of Damage to buildings, structures and Services as a result of the dewatering is no longer present.

Groundwater monitoring

55. Groundwater monitoring is to be undertaken at the groundwater monitoring bore locations shown on the plans titled “Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells”, Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018, or in the approved GSMCP. Groundwater level monitoring is to be undertaken in accordance with Schedule C below:

Schedule C: Groundwater Monitoring Frequency

Schedule C: Groundwater Monitoring Frequency					
Bore Name*	Location		Groundwater level monitoring frequency (to an accuracy of 10mm)		
	Easting (mE)	Northing (mN)	Two months prior to Commencement of Dewatering until Commencement of Dewatering	From Commencement of Dewatering to Completion of Dewatering	From Completion of Dewatering until 3 months later
SA/PZ1A SA/PZ2A SA/PZ1B* PS/PZ1	tbc	tbc	Continuously using electronic data loggers	Continuously using electronic data loggers and recovered at weekly intervals	Continuously using electronic data loggers and recovered at monthly intervals

Advice note: The number and locations of groundwater monitoring bores are based on the worst case scenario as shown on the plan titled “Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells, Groundwater and Settlement Monitoring – PS1 and Shaft A Option 1”, Figure 2A, 2b, 03 & 04 Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018, and may change depending on the final pipeline and shaft locations and selected construction method.

The monitoring frequency may be changed if approved by the Team Leader - Compliance Monitoring NW1. Any change shall be specified in the GSMCP. In addition, the three month monitoring period post Completion of Dewatering may be extended, by the Team Leader Compliance Monitoring NW1, if measured groundwater levels are not consistent with inferred seasonal trends or predicted groundwater movement.

Advice note: If groundwater level measurements show an inconsistent pattern immediately prior to the Commencement of Dewatering (for example varying more than +/-200mm during a month), then further readings may be required to ensure that an accurate groundwater level baseline is established before dewatering commences.

Ground surface and building deformation monitoring

56. Ground Surface and Building Deformation Monitoring Stations shall be established and maintained at the approximate locations shown on the plans titled “Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells”, Figures 1, 2A, 2B, 3 & 4, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018. The Monitoring Stations will be monitored at the frequency set out in Schedule D. The purpose of the Monitoring Stations is to record any vertical or horizontal movement.

Benchmark positions shall be established no less than 50 metres away from the excavated area.

Schedule D: Ground Surface and Building Monitoring

Schedule D: Ground Surface and Building Monitoring			
Monitoring Station and type	Frequency		
	Pre-Commencement of Dewatering or Excavation	Commencement to Completion of Dewatering	Post- Completion of Dewatering
<i>Ground: 28 points *</i>	Twice to a horizontal and vertical accuracy of +/-2mm (achieved by precise levelling)	Weekly or every 2m of shaft excavation or 10m of tunnel excavation, whichever is more frequent	Monthly for 6 months
<i>Buildings: 26 points *</i>	Twice to a horizontal and vertical accuracy of +/-2mm (achieved by precise levelling)	Horizontal monitoring is only required for buildings where the trigger limits are more than 10mm or steeper than 1/500	Monthly for 6 months

Advice note: The number of monitoring points is based on the worst case scenario as shown on the plan titled “Watercare Northeast Wastewater Conveyance Scheme Warkworth to Snells, Groundwater and Settlement Monitoring – PS1 and Shaft A Option 1”, Figure 2A, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated September 2018, and may change depending on the final pipeline and shaft locations and selected construction method.

The monitoring frequency may be changed, if approved by the Team Leader - Compliance Monitoring NW1.

Retaining wall monitoring

57. Four (4) retaining wall deflection stations, for the measurement of lateral wall movement, shall be installed along the top of the Shaft A walls as discussed in the report titled North East Conveyance – Warkworth to Snells Beach WWTP Groundwater Settlement Monitoring and Contingency Plan”, Project No. 1005254.1000, prepared by Tonkin & Taylor Ltd, dated November 2018. Monitoring of the retaining wall deflection stations shall be undertaken and recorded in accordance with Schedule E below and shall be carried out using precise levelling.

58. Schedule E: Retaining Wall Monitoring

Schedule E: Retaining Wall Monitoring		
Frequency		
Pre-Commencement of Dewatering	Commencement of Dewatering to one month after Completion of Excavation	One month after Completion of Excavation to Completion of Dewatering
Twice to a horizontal and vertical accuracy of +/-2mm	Once for every 2 metres depth (on average) of excavation and when changes to the propping system are being carried out and, in any case, at a minimum of once weekly.	Monthly

The monitoring frequency may be changed, if approved by the Team Leader - Compliance Monitoring NW1, through the GSMCP.

Access to third party property

59. Where any monitoring, inspection or condition survey in this consent requires access to property/ies owned by a third party, and access is declined or subject to what the consent holder considers to be unreasonable terms, the Consent Holder shall provide a report to the Team Leader - Compliance Monitoring NW1 prepared by a SQEP identifying an alternative monitoring programme. The report shall describe how the monitoring will provide sufficient early detection of deformation to enable measures to be implemented to prevent Damage to buildings, structures or Services. Written approval from the Team Leader Compliance Monitoring NW1 shall be obtained before an alternative monitoring option is implemented.

Contingency actions

60. If the consent holder becomes aware of any Damage to buildings, structures or Services potentially caused wholly, or in part, by the exercise of this consent, the Consent Holder shall:
- (a) Notify the Team Leader Compliance Monitoring NW1 and the asset owner within two working days of the consent holder becoming aware of the Damage.
 - (b) Provide a report prepared by a SQEP (engaged by the Consent Holder at their cost) that describes the Damage; identifies the cause of the Damage; identifies methods to remedy and/or mitigate the Damage that has been caused; identifies the potential for further Damage to occur, and describes actions that will be taken to avoid further Damage.
 - (c) Provide a copy of the report prepared under (b) above, to the Team Leader Compliance Monitoring NW1 and the asset owner within 10 working days of notification under (a) above.

Advice note: *It is anticipated the Consent Holder will seek the permission of the damaged asset to access the property and asset to enable the inspection/investigation. It is understood that if access is denied the report will be of limited extent.*

Building, structure, and services surveys and inspections

61. A copy of all pre-dewatering building, structure condition surveys, and Service condition surveys and photographic records of external visual inspections required by this consent shall be submitted to the Team Leader Compliance Monitoring NW1 with the GSMCP. All other condition surveys and photographic records required by this consent shall be provided to the Team Leader - Compliance Monitoring NW1 upon request.

Reporting of monitoring data

62. At two monthly intervals, a report containing all monitoring data required by conditions of this consent shall be submitted to the Team Leader - Compliance Monitoring NW1. This report shall include a construction progress timeline, the monitoring data (including the

results of condition surveys) recorded in that period, and, a comparison of that data with previously recorded data and with the Alert and Alarm Levels for each Monitoring Station.

63. Upon Completion of Construction, one electronic data file (excel workbook) containing digital data for all groundwater monitoring bores shall be provided to the Team Leader Compliance Monitoring NW1. Data should include: the monitoring bore name, type, location (NZTM easting / northing and elevation), screened depth for groundwater monitoring bores, absolute and relative readings (and their units of measure) and the date / time of each reading. The worksheets should contain data values only (no formulas, circular references or links to other sheets).

Notice of completion

64. The Team Leader - Compliance Monitoring NW1 shall be advised in writing within 10 working days of when excavation and dewatering has been completed.

Advice note: *The Consent Holder is advised that the discharge of pumped groundwater to a stormwater system or waterbody will need to comply with any other regulations, bylaws or discharge rules that may apply.*

Specific conditions - streamworks consent (LUS60331447)

Culvert Design

65. Prior to any streamworks commencing, finalised culvert designs for the 'eastern' and 'western' culverts shall be provided to the Team Leader – Compliance Monitoring NW1. No streamworks shall commence until written confirmation from the Team Leader – Compliance Monitoring NW1 has been provided that the design is satisfactory. The culvert designs shall include:
- (a) An assessment of velocities through the pipe.
 - (b) An assessment of flood flows and the capacity to accommodate flows.
 - (c) An assessment of the potential for erosion and scour to occur at the inlet, outlet and embankments.
 - (d) Longitudinal section drawings.
 - (e) Cross section drawings from both upstream and downstream of the culvert.
 - (f) Details of erosion and scour protection including type and sizing.
 - (g) An assessment of fish passage through the proposed culverts detailing how fish passage will be provided for.
66. The culverts associated with the private way shall be sized so that the accessway is not flooded more than 200mm during a 1% AEP storm event in accordance with the Auckland Council Stormwater Code of Practice.
67. The culverts shall be constructed in accordance with the approved culvert designs required by Condition 65. As-built drawings of the constructed culvert by a suitably qualified and experienced engineer, shall be provided to the Team Leader – Compliance Monitoring NW1 within three (3) months following their completion.

Streamworks and coastal management plan

68. Prior to the commencement of any works within the river or coastal marine area, a final Streamworks and Coastal Management Plan shall be provided to the Team Leader – Compliance Monitoring NW1 for certification. No works shall commence until written confirmation from the Team Leader is provided that the Streamworks and Coastal Management Plan is satisfactory.
- (a) Details of when and how proposed machinery is to be used in the coastal marine area including mitigation measures. i.e. Tracking pads.
 - (b) Final details and position of the coffer dam.
 - (c) Location and type of machinery to be used when installing the coffer dam.
 - (d) Dewatering and diversion methodology including any pump details (including capacity and treatment of sediment laden water)
 - (e) Location, sizing, capacity and dimensions of all proposed controls.
 - (f) De-fishing details., including:
 - (i) Methodologies to capture fish.
 - (ii) Fishing effort
 - (iii) A qualified ecologist to undertake the capture and relocation.
 - (iv) Details of the relocation site.
 - (v) Storage and transport measures including prevention of predation and death during capture.
 - (vi) Euthanasia methods for diseased or pest species.
 - (vii) An ecologist onsite to supervise during dewatering activities.
 - (g) Timing and duration.

Culvert installation methodology and sequencing

69. All works within the river and coastal marine area shall be undertaken in accordance with the certified Streamworks and Coastal Management Plan required by Condition 68.
70. Any pumps used for dewatering or diversion activities shall contain a mesh screen made of smooth material with openings between 2-3mm to prevent fish from entering the pump.
71. The temporary coffer dam between the river and the costal marine area required for culvert construction, shall be in place for a period no longer than two months unless written approval is provided by the Team Leader – Compliance Monitoring NW1.
72. The new culverts shall be constructed within a two-month period following initial construction of the temporary coffer dam, unless written approval is provided by the Team Leader – compliance Monitoring NW1.

73. No works for the private access road upgrade in the river or coastal marine area shall be undertaken between 1 May and 1 December in any year, without the prior written approval of the Team Leader – Compliance Monitoring NW1, at least two weeks prior to 30 April of any year. Also, to protect downstream fish (inanga) spawning habitat, no streamworks shall be undertaken, nor will any written approval be provided, during the spawning season (1 September to 1 December).

Reclamation at DPSA1

74. Within 6 months of the date of this consent, or an alternative timeframe, as agreed between the consent holder and Council, the consent holder shall provide the Team Leader – Compliance Monitoring NW1 with a Freshwater Enhancement Plan for certification that it achieves the objective set out in Condition 75 below.
75. The objective of the Freshwater Enhancement Plan shall be to identify and provide for suitable offset and/or compensation for the loss of the intermittent stream at 265 Sandspit Road (Lot 2 DP 382328) authorised as part of this consent. This plan shall be prepared by a suitably qualified freshwater ecologist and shall include, as a minimum:
- (a) final location details of the offset/compensation site(s)
 - (b) full calculations (including all supporting documentation) to determine the required amount of offsetting, including on site and off site SEV and ECR calculations, in accordance with TR2011/009 and TP148.
 - (c) plans that identify the onsite impact and offsite mitigation locations for both streams which clearly depict the widths of all riparian margins and the length of stream being impacted and mitigated.
 - (d) a description of, and reasons for the form of enhancement will take. This shall include (but is not limited to):
 - (i) riparian planting
 - (ii) daylight or naturalisation; and
 - (iii) instream habitat enhancement
 - (e) a detailed programme for the implementation of the compensation works demonstrating how they will be completed within 12 months of the commencement of the reclamation

Advice Note: *If the Freshwater Enhancement Plan is not received within 6 months the consent holder may be required to provide an updated ecological assessment as part of the SEV calculations.*

Appendix 16 of the AUP(OP) Guideline for native revegetation planting offers a framework by which the Freshwater Enhancement Plan should be developed, as it details those matters that Council consider important to ensuring that mitigation planting is successful

Fish salvage and relocation

76. A suitably qualified and experienced freshwater ecologist shall undertake a fish salvage during stream reclamation to remove and relocate any native fish found to a suitable alternative location within the same stream system as the impact reach. The results of the

fish relocation shall be reported to Team Leader Compliance Monitoring NW1 and include relocation sites, fish species and numbers relocated.

77. If the offset mitigation site is not located on land owned by the consent holder, the enhancement works required by the Freshwater Enhancement Plan shall be protected in perpetuity by a suitable legal mechanism. Draft legal documents shall be submitted to the Team Leader - Compliance Monitoring NW1 for certification, two months following completion of the enhancement works.
78. The Team Leader - Compliance Monitoring NW1, shall advise whether the legal documents need to be registered on the certificate of title for the enhancement site(s). If legal documents are required to be registered on the title(s), the consent holder shall provide evidence that the approved legal documents have been registered on the title within three months following council certification under Condition 77.

Advice notes

1. *Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.*
2. *For the purpose of compliance with the conditions of consent, “the council” refers to the council’s monitoring inspector unless otherwise specified. Please contact monitoring@aucklandcouncil.govt.nz to identify your allocated officer.*
3. *For more information on the resource consent process with Auckland Council see the council’s website: www.aucklandcouncil.govt.nz. General information on resource consents, including making an application to vary or cancel consent conditions can be found on the Ministry for the Environment’s website: www.mfe.govt.nz.*
4. *If you as the applicant disagree with any of the above conditions, or disagree with the additional charges relating to the processing of the application, you have a right of objection pursuant to sections 357A or 357B of the Resource Management Act 1991. Any objection must be made in writing to the council within 15 working days of your receipt of this decision (for s357A) or receipt of the council invoice (for s357B).*
5. *The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (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 building consent approval. Please check whether a building consent is required under the Building Act 2004.*

Delegated decision maker:

Name: Nicola Broadbent
Title: Team Leader, Resource Consents

Signed:

Handwritten signature in blue ink that reads "R. Broadbent".

Date:

31/07/2019

Appendix A – Site addresses and Legal Description of Project office

1 Bertram Street - Lot 130 DP 80665 (Lucy Moore Memorial Park)	Lot 1 DP 65278 (Puhinui Scenic Reserve)
1 Bertram Street - Allotment 408 Psh of Mahurangi (Lucy Moore Memorial Park)	198 Sandspit Road - Lot 1 DP 155020
1 Bertram Street - Lot 2 Sec 13 Allotment 67 Psh of Mahurangi (Lucy Moore Memorial Park)	265 Sandspit Road - Lot 2 DP 382328
1 Bertram Street - Lot 1 Sec 13 Allotment 67 Psh of Mahurangi (Lucy Moore Memorial Park)	Sandspit Road
Lilburn Street (Lucy Moore Memorial Park)	513A Sandspit Road - Lot 1 DP 526431
1 Bertram Street - Lot 1 Sec 2 Allotment 67 Psh of Mahurangi (Lucy Moore Memorial Park)	206 Mahurangi East - Lot 1 DP 347005
1 Bertram Street - Lot 2 Sec 2 Allotment 67 Psh of Mahurangi (Lucy Moore Memorial Park)	254-268 Mahurangi East Road Lot 3 DP 347005
1 Bertram Street - Lot 3 Sec 2 Allotment 67 Psh of Mahurangi (Lucy Moore Memorial Park)	Lot 5 DP 193583 (WWTP private access off Hamatana Road)
1 Bertram Street - Lot 4 Sec 2 Allotment 67 Psh of Mahurangi (Lucy Moore Memorial Park)	Lot 5 DP 518302 (WWTP private access off Hamatana Road)
Baxter Street	Lot 4 DP 193583 (WWTP private access off Hamatana Road)
Mahurangi River	Lot 3 DP 193583 (private access and WWTP site)

Appendix B – List of properties excluded from public notification assessment

23 Rivendell Place, Warkworth	21 Rivendell Place, Warkworth
9 Rivendell Place, Warkworth	7 Rivendell Place, Warkworth
5 Rivendell Place, Warkworth	33 Alnwick Street, Warkworth
31 Alnwick Street, Warkworth	29 Alnwick Street, Warkworth
26A Alnwick Street, Warkworth	27 and 27 Alnwick Street, Warkworth
5 Lilburn Street, Warkworth	24 Warkworth Street, Warkworth
1 Lilburn Street, Warkworth	1A Lilburn Street, Warkworth
2 Lilburn Street, Warkworth	3 Bertram Street, Warkworth
28 Baxter Street, Warkworth	142 Sandspit Road, Warkworth
146 Sandspit Road, Warkworth	163 Sandspit Road, Warkworth
209 Sandspit Road, Warkworth	325 Sandspit Road, Warkworth
360 Sandspit Road, Warkworth	384 Sandspit Road, Warkworth
448 Sandspit Road, Warkworth	513 Sandspit Road, Warkworth
498 Sandspit Road, Warkworth	526 Sandspit Road, Warkworth
528 Sandspit Road, Warkworth	584 Sandspit Road, Warkworth
591 Sandspit Road, Warkworth	623 Sandspit Road, Warkworth
4 Hamilton Road, Warkworth	6 Hamilton Road, Warkworth
32 Hamilton Road, Warkworth	17 Hamilton Road, Warkworth
653 Sandspit Road, Warkworth	732 Sandspit Road, Warkworth
Pt Allot 25 SO 888A, Sandspit Road, Matakana	786 Sandspit Road, Snells Beach
826 Sandspit Road, Snells Beach	836 Sandspit Road, Snells Beach
12 Mahurangi East Road, Snells Beach	Lot 1 DP 426584 Sandspit Road, Snells Beach
1 Mahurangi East Road, Snells Beach	16 Mahurangi East Road, Snells Beach
3 Mahurangi East Road, Snells Beach	20 Mahurangi East Road, Snells Beach
25 Mahurangi East Road, Snells Beach	24 Mahurangi East Road, Snells Beach
30 Mahurangi East Road, Snells Beach	34 Mahurangi East Road, Snells Beach
35 Mahurangi East Road, Snells Beach	39 Mahurangi East Road, Snells Beach

42 Mahurangi East Road, Snells Beach	48 Mahurangi East Road, Snells Beach
45 Mahurangi East Road, Snells Beach	51 Mahurangi East Road, Snells Beach
55 Mahurangi East Road, Snells Beach	Allot 197 SO 55382 Mahurangi East Road, Snells Beach
61 Mahurangi East Road, Snells Beach	65 Mahurangi East Road, Snells Beach
1 James Street, Snells Beach	4 James Street, Snells Beach
2 James Street, Snells Beach	73 Mahurangi East Road, Snells Beach
75 Mahurangi East Road, Snells Beach	Lot 4 DP 205704 Mahurangi East Road, Snells Beach
Lot 5 DP 205704 Mahurangi East Road, Snells Beach	95 Mahurangi East Road, Snells Beach
107 Mahurangi East Road, Snells Beach	165 Mahurangi East Road, Snells Beach
125 Mahurangi East Road, Snells Beach	187 Mahurangi East Road, Snells Beach
149 Mahurangi East Road, Snells Beach	149 Mahurangi East Road, Snells Beach
Lot 4 DP 193853 Hamatana Road, Snells Beach	Lot 206 DP 133261 Mahurangi East Road, Snells Beach
157 Mahurangi East Road, Snells Beach	181 Mahurangi East Road, Snells Beach
189 Mahurangi East Road, Snells Beach	173 Mahurangi East Road, Snells Beach
152 Mahurangi East Road, Snells Beach	162 Mahurangi East Road, Snells Beach
154 Mahurangi East Road, Snells Beach	133 Mahurangi East Road, Snells Beach
139 Mahurangi East Road, Snells Beach	121 Mahurangi East Road, Snells Beach
185 Mahurangi East Road, Snells Beach	160 Mahurangi East Road, Snells Beach
164 Mahurangi East Road, Snells Beach	191 Mahurangi East Road, Snells Beach
127 Mahurangi East Road, Snells Beach	199 Mahurangi East Road, Snells Beach
153 Mahurangi East Road, Snells Beach	129 Mahurangi East Road, Snells Beach
183 Mahurangi East Road, Snells Beach	197 Mahurangi East Road, Snells Beach
124 Mahurangi East Road, Snells Beach	193 Mahurangi East Road, Snells Beach
175 Mahurangi East Road, Snells Beach	131 Mahurangi East Road, Snells Beach
155 Mahurangi East Road, Snells Beach	123 Mahurangi East Road, Snells Beach
120 Hamatana Road, Snells Beach	163 Mahurangi East Road, Snells Beach
147 Mahurangi East Road, Snells Beach	161 Mahurangi East Road, Snells Beach
135 Mahurangi East Road, Snells Beach	195 Mahurangi East Road, Snells Beach

156 Mahurangi East Road, Snells Beach	137 Mahurangi East Road, Snells Beach
145 Mahurangi East Road, Snells Beach	158 Mahurangi East Road, Snells Beach
124 Hamatana Road, Snells Beach	

Appendix C – List of application documents

Report title and reference	Author	Rev	Dated
Ecological Assessment – North East Conveyance and Snells Beach WWTP	Beca	B	24/09/2018
Arboriculture Assessment NE Wastewater Conveyance, Warkworth to Snells WWTP Transfer Pipeline	Greenscene NZ	-	14/11/2018
North East Conveyance – Warkworth to Snells Beach WWTP Geotechnical Interpretative Report	Tonkin & Taylor	3	November 2018
North East Conveyance – Warkworth to Snells Beach Transfer Pipeline Groundwater Technical Assessment Report	Tonkin & Taylor	4	November 2018
NE Wastewater Conveyance Scheme – Assessment of Acoustic Effects	Marshall Day Acoustics	-	26/10/2018
Ecological Assessment of Western Culver Upgrade for NE WW Conveyance Works - supplementary	Beca	2	21/02/2019

Drawing title and reference	Author	Rev	Dated
2012971.002 Locality Plan	Watercare	2	10/09/2018
2012971.003 Plan and Longitudinal Section: Rising Main – CH 100 to 300 - Sheet 1	Watercare	2	10/09/2018
2012971.004 Plan and Longitudinal Section: Rising Main – CH 300 to 600 - Sheet 2	Watercare	2	10/09/2018
2012971.005 Plan: Rising Main – CH 600 to 900 - Sheet 3A	Watercare	2	10/09/2018
2012971.006 Longitudinal Section: Rising Main – CH 600 to 900 - Sheet 3B	Watercare	2	10/09/2018
2012971.007 Plan and Longitudinal Section: Rising Main – CH 900 to 1200 - Sheet 4	Watercare	2	10/09/2018
2012971.008 Plan and Longitudinal Section: Rising Main – CH 1200 to 1500 - Sheet 5	Watercare	2	10/09/2018
2012971.010 Plan and Longitudinal Section: Rising Main – CH 1800 to 2100 - Sheet 7	Watercare	2	10/09/2018
2012971.011 Plan and Longitudinal Section: Rising Main – CH 2100 to 2400 - Sheet 8	Watercare	2	10/09/2018
2012971.012 Plan and Longitudinal Section: Rising Main – CH 2400 to 2700 - Sheet 9	Watercare	2	10/09/2018
2012971.013 Plan and Longitudinal Section: Rising Main – CH 2700 to 3000 - Sheet 10	Watercare	2	10/09/2018
2012971.014 Plan and Longitudinal Section: Rising Main – CH 3000 to 3300 - Sheet 11	Watercare	2	10/09/2018
2012971.015 Plan and Longitudinal Section: Rising Main – CH 3300 to 3600 - Sheet 12	Watercare	2	10/09/2018
2012971.016 Plan and Longitudinal Section: Rising Main – CH 3600 to 3900 - Sheet 13	Watercare	2	10/09/2018
2012971.017 Plan and Longitudinal Section: Rising Main – CH 3900 to 4200 - Sheet 14	Watercare	2	10/09/2018
2012971.018 Plan and Longitudinal Section: Rising Main – CH 4200 to 4500 - Sheet 15	Watercare	2	10/09/2018
2012971.019 Plan and Longitudinal Section: Rising Main – CH 4500 to 4800 - Sheet 16	Watercare	2	10/09/2018
2012971.020 Plan and Longitudinal Section: Rising Main – CH 4800 to 5100 - Sheet 17	Watercare	2	10/09/2018
2012971.021 Plan and Longitudinal Section: Rising Main – CH 5100 to 5400 - Sheet 18	Watercare	2	10/09/2018
3254607-LA-001 Warkworth to Snells Transfer Pipeline Hamatana Road Ecological Planting	Watercare	A	10/04/2019
3254607-LA-001 Warkworth to Snells Transfer Pipeline Hamatana Road Ecological Planting [planting schedule]	Watercare	A	10/04/2019

Other additional information	Author	Rev	Dated
Ecological Assessment of Western Culvert Upgrade for NE WW Conveyance Works – supplementary	Beca	2	21/02/2019
NE Conveyance – Snells Beach WWTP access road – Weed Control Plan	Beca	3	18/04/2019
Response to request for further information under section 92 of the Resource Management Act 1991 (BUN60330590, LUS60331447, WAT60330596, LUC60330594)	Beca	-	27/02/2019
Vegetation Clearance Detail	Beca	-	27/02/2019
North-East Wastewater Conveyance Works – Supplementary Assessment of Effects on the Environment associated with the installation of culverts	Beca	-	27/02/2019
Tree Asset Owner Approval – Application Form	Auckland Council (Community Facilities)		05/11/2018
North East Wastewater Conveyance Streamworks Assessment of Effect on the Environment	Beca	2	16/07/2019
Response to request for further information under section 92 of the Resource Management Act 1991 (BUN60330590, LUS60331447, WAT60330596, LUC60330594)	Beca	-	16/05/2019
Response to request for further information under section 92 of the Resource Management Act 1991 (BUN60330590, LUS60331447, WAT60330596, LUC60330594)	Beca	-	18/04/2019

Decision on application for resource consent under the Resource Management Act 1991



Restricted Discretionary activity

Application number: LUC60309679
Applicant: Southern Paprika Ltd
Site address: 476 Woodcocks Road, Streamlands
Legal description: Lot 2 DP 511457

Proposal:

To undertake earthworks comprising 116,000m³ (58000m³ of cut and 58000m³ of fill) across an area of 161,000m² to facilitate building platforms for glasshouses and excavations for associated ponds. The works will be completed in two stages:

Stage 1 will comprise 24,500m³ of cut to fill earthwork across 4.8ha.

Stage 2 will comprise 82,500m³ of cut to fill earthwork across 11.3ha.

The resource consent(s) are:

Land use consents (s9) – LUC60309679

Auckland Unitary Plan (Operative In Part)

District land use (operative plan provisions)

Land disturbance – Regional

- To undertake general earthworks of 161,000m², as the earthworks are greater than 50,000m² where land has a slope less than 10 degrees outside the Sediment Control Protection Area, as a restricted discretionary activity under rule E11.4.1(A5).

Land disturbance – District

- To undertake general earthworks of 161,000m², as the earthworks are greater than 2500m² in a rural zone, as a restricted discretionary activity under rule E12.4.1(A6).
- To undertake general earthworks of 116,000m³, as the earthworks are greater than 2500m³ in a rural zone, as a restricted discretionary activity under rule E12.4.1(A10).

Natural hazards and flooding

- The construction of land drainage works, stormwater management devices or flood mitigation works, which are not vested with Council, are not identified on a precinct plan and are not approved via network discharge consent, in the 1 per cent annual exceedance probability (AEP) floodplain, as a restricted discretionary activity under rule E36.4.1(A33).

Decision

I have read the application, supporting documents, and the report and recommendations on the application. I am satisfied that I have adequate information to consider the matters required by the Resource Management Act 1991 (RMA) and make a decision under delegated authority on the application.

Acting under delegated authority, under sections 104, 104C and 108 the application is **GRANTED**.

1. Reasons

The reasons for this decision are:

1. In accordance with an assessment under ss104(1)(a) of the RMA the actual and potential effects from the proposal will be acceptable as:
 - The sediment and erosion effects have been fully evaluated by Council's Sediment Management Consultant (*Earth, Streams and Trees Team, Specialist Unit*) and Council's Development Engineer; Steve Cavanagh who both consider that subject to the imposition of consent conditions, the potential sediment related effects on the receiving environment will be adequately managed.
 - Adverse character, amenity and landscape effects resulting from the development are considered to be no more than minor. The finished contours of earth worked area will not be dissimilar to the existing range of contours.
 - No adverse stability issues are anticipated to occur as a result of earthworks activities. Council's Development Engineer; Steve Cavanagh, has reviewed the application and has not raised any concerns in respect of the stability of the subject site and neighbouring properties as a result of the earthworks.
 - Construction effects from the works proposed will be mitigated through conditions of consent which include the requirement to produce a Dust Management Plan.
 - Whilst the proposal is located within a statutory acknowledgement area the site contains no items registered on the Councils Cultural Heritage List or no Sites or Places of Value to Mana Whenua. The proposed works are therefore not anticipated to adversely affect the cultural traditions and values of Mana Whenua. Local iwi also had the opportunity to comment on the application and have not done so. Accidental protocol conditions are to be included.
2. In terms of positive effects:
 - The earthworks proposed will contribute towards assisting with facilitating building platforms for glasshouses and excavations for associated ponds.
3. In accordance with an assessment under s104(1)(b) of the RMA the proposal is consistent with the relevant statutory documents. In particular, the application is generally consistent with the following objectives and policies within the Auckland Unitary Plan (Operative In Part) E11.2 Objectives and E11.3 Policies, E12.2 Objectives and E12.3 Policies, H19.2.1 and H19.3.2 Objectives and H19.2.2 and H19.3.3 Policies and E36.2 Objectives and E36.3 Policies. The proposed land disturbing activities employ methods that avoid, remedy and mitigate adverse effects in this area. Effects

are able to be mitigated to the extent that amenity values on adjoining areas are not compromised. The development will maintain and enhance the quality of the natural environment, which will take place through the effective management and control of sediment and erosion control devices on the site while earthworks are in progress.

4. In accordance with an assessment under s104(1)(c) of the RMA no other matters are considered relevant.
5. The proposal achieves the sustainable management purpose of the RMA under Part 2 because the application aligns with relevant provisions within Part 2 of the RMA relating to providing for economic, social and cultural wellbeing while mitigating adverse effects (Section 5). In this instance Section 6 of the RMA is not relevant as the application will not have any effects on the matters of national importance. The proposal is consistent with Section 7 as it will allow the efficient use of land resources while maintaining the quality of the environment. With regards to Section 8, local iwi had the opportunity to comment on the application. It is considered that there are no Treaty matters of significance to this application.

Overall it is considered that the proposal will have actual and potential effects on the environment that are acceptable. The proposal is consistent with the objectives and policies of the Auckland Unitary Plan Operative in part (AUP(OP)) and the purpose and principles of the RMA.

Conditions

Under section 108 of the RMA, this consent is subject to the following conditions:

Activity in accordance with plans

1. The earthworks shall be carried out in accordance with the plans and all information submitted with the application, detailed below, and all referenced by the council as consent number(s) LUC60309679.
 - Application Form, Assessment of Environmental Effects prepared by Terra Nova Planning, dated October 2017 and the s.92 response dated 19 December 2017.

<i>Plan title and reference</i>	<i>Author</i>	<i>Rev</i>	<i>Dated</i>
Existing Site Plan (Sheet GE-002)	Hutchinson Consulting Engineers		Oct 2017
Proposed Site Plan (Sheet GE-003)	Hutchinson Consulting Engineers	-	Oct 2017
Existing Contour Plan (Sheet EW-101)	Hutchinson Consulting Engineers	-	Oct 2017
Existing Flood Plain and Overland Flow Path Plan (Sheet EW-102)	Hutchinson Consulting Engineers	-	Oct 2017

Proposed Contour Plan (Sheet EW-103)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Contour Plan - Stage 1 (Sheet EW-104)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Contour Plan - Stage 2 (Sheet EW-105)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Site Cross Sections (Sheet EW-106)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Site Cross Sections (Sheet EW-107)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Site Cross Sections (Sheet EW-108)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Earthworks Plan – Stage 1 (Sheet EW-109)	Hutchinson Consulting Engineers	-	Oct 2017
Proposed Earthworks Plan – Stage 2 (Sheet EW-110)	Hutchinson Consulting Engineers	-	Oct 2017
Erosion and Sediment Control Plan - Stage 1 (Sheet EW-111)	Hutchinson Consulting Engineers	-	Oct 2017
Erosion and Sediment Control Plan - Stage 2 (Sheet EW-112)	Hutchinson Consulting Engineers	-	Oct 2017
USLE Plan (Sheet EW-115)	Hutchinson Consultants Engineers	-	Oct 2017
Report titled and reference	Author	Rev	Dated
Southern Paprika Limited, Proposed Development at 476 Woodcocks Road, Warkworth (Ref. L19785a)	Hutchinson Consulting Engineers Limited	-	10 October 2017
Southern Paprika, Geotechnical Investigation Report (Ref. L19785)	Hutchinson Consulting Engineers Limited	-	14 December 2017

<i>Other additional information</i>	<i>Author</i>	<i>Rev</i>	<i>Dated</i>
Section 92 response: Letter from Ian Hutchinson Consultants Ltd to Samuel Morrison, subject: "REQUEST FOR ADDITIONAL INFORMATION LUC60309679 PROPOSED DEVELOPMENT AT 476 WOODCOCKS ROAD, WARKWORTH FOR SOUTHERN PAPRIKA LIMITED", dated 19 December 2017	Ian Hutchinson Consultants Ltd	-	19/12/2018
Section 92 response: Email from Lance Hessell to Samuel Morrison, subject: "RE: LUC60309679 Information Request - 476 Woodcocks Road - Wastewater aspects", sent Wednesday, 20 December 2017 10:10 a.m.	Lance Hessell	-	20/12/2018

Lapse of consent

2. Under section 125 of the RMA, this consent lapses five years after the date it is granted unless:
 - a. The consent is given effect to; or
 - b. The council extends the period after which the consent lapses.

Monitoring fee

3. The consent holder shall pay the council an initial consent compliance monitoring charge of \$960 (inclusive of GST), plus any further monitoring charge or charges to recover the actual and reasonable costs that have been incurred to ensure compliance with the conditions attached to this consent.

Advice note:

The initial monitoring charge is to cover the cost of inspecting the site, carrying out tests, reviewing conditions, updating files, etc, all being work to ensure compliance with the resource consent. In order to recover actual and reasonable costs, inspections, in excess of those covered by the base fee paid, shall be charged at the relevant hourly rate applicable at the time. The consent holder will be advised of the further monitoring charge or charges as they fall due. Such further charges are to be paid within one month of the date of invoice. Only after all conditions of the resource consent have been met, will the council issue a letter confirming compliance on request of the consent holder.

Duration

4. Resource consent LUC60309679 shall expire five years from the date of issue unless it has been surrendered or been cancelled at an earlier date pursuant to the RMA.

Notification of earthworks commencing

5. The Team Leader, Compliance Monitoring NW1, shall be notified at least two (2) working days prior to earthwork activities commencing on the subject site. Email: ResourceConsentAdmin@aucklandcouncil.govt.nz.

Advice Note:

Condition 4 requires the consent holder to notify Council of their intention to begin earthworks a minimum of two working days prior to commencement. Please contact the Team Leader, Compliance Monitoring NW1 to advise of the start of works.

Erosion and Sediment Control Plans

6. At least 10 working days prior to the commencement of works on the site, updated Erosion and Sediment Control Plans, based on the erosion and sediment control plans listed in Condition 1, shall be submitted to the Team Leader, Compliance Monitoring NW1 for certification. Those plans shall include confirmation that:

- All erosion and sediment controls are sized in accordance with GD05, unless a higher standard is required by conditions of this consent.
- All sediment retention ponds (SRPs) with contributing flow paths greater than 200m shall have storage volumes sized at a ratio of at least 3% of each contributing catchment;
- The SRP servicing the catchment greater than 5.0ha shall have a storage volume that is maximised to the greatest extent practicable in excess of 3% of the contributing catchment; and
- The boundary between SRP catchments within a stage of works will be maintained on a daily basis (by formation of channels or bunds) to ensure that such catchments do not exceed the design capacity of any SRP.

Advice Note:

In the event that minor amendments to the erosion and / or sediment controls are required, any such amendments should be limited to the scope of this consent. Any amendments which affect the performance of the controls may require an application to be made in accordance with section 127 of the RMA. Any minor amendments should be provided to the Team Leader, Compliance Monitoring NW 1 prior to implementation to confirm that they are within the scope of this consent.

Chemical Treatment Management Plan (CTMP)

7. At least 10 working days prior to the commencement of bulk earthworks at the site, a Chemical Treatment Management Plan (CTMP) shall be submitted for the written approval of the Team Leader, Compliance Monitoring NW1. The plan shall include as a minimum:
- (a) Specific design details of the chemical treatment dosing system for the site sediment retention pond and decanting earth bunds;
 - (b) Monitoring, maintenance (including post-storm) and contingency programme (including a record sheet);

- (c) Details of optimum dosage (including assumptions);
- (d) Results of initial chemical treatment trial;
- (e) A spill contingency plan; and
- (f) Details of the person or bodies that will hold responsibility for long-term operation and maintenance of the chemical treatment system and the organisational structure which will support this system.

Sediment Retention Ponds (SRP's)

8. The SRPs shall be treated in accordance with the approved CTMP required by Condition 7. Any amendments to the CTMP shall be submitted in writing to the Team Leader, Compliance Monitoring NW1, for written certification prior to implementation.

Dust Management Plan (DMP)

9. At least 10 working days prior to the commencement of earthworks on site, the consent holder shall submit to the Team Leader, Compliance Monitoring NW1, a Dust Management Plan (DMP) for certification. The DMP shall include, but not be limited to, the following matters:
 - (a) Measures to be employed on site to prevent noxious, dangerous, offensive or objectionable emissions of dust beyond the boundary of the site;
 - (b) Identification of roles and positions of responsibility for monitoring and managing dust emissions;
 - (c) A list and map of all potentially sensitive neighbouring properties;
 - (d) Monitoring procedures;
 - (e) Reporting procedures; and
 - (f) Complaint receipt and response procedures.
10. The DMP, as certified by the Team Leader, Compliance Monitoring NW1, shall be implemented for the duration of the earthworks on the site.

Pre-Start Meeting

11. Prior to the commencement of the earthworks activity, the consent holder shall hold a pre-start meeting that:
 - is located on the subject site
 - is scheduled **not less than five days** before the anticipated commencement of earthworks
 - includes Auckland Council officer[s]
 - includes representation from the contractors who will undertake the works

The meeting shall discuss the erosion and sediment control measures and SRP chemical treatment system, and shall ensure all relevant parties are aware of and familiar with the necessary conditions of this consent.

The following information shall be made available at the pre-start meeting:

- Timeframes for key stages of the works authorised under this consent,

- Resource consent conditions,
- Updated Erosion and Sediment Control Plans (Condition 6),
- Chemical Treatment Management Plan (Condition 7)
- The Dust Management Plan (Condition 9)

Advice Note:

To arrange the pre-start meeting please contact the Team Leader, Compliance Monitoring NW 1 to arrange this meeting on monitoring@aucklandcouncilgovt.nz, or 09 301 0101. The conditions of consent should be discussed at this meeting. All additional information required by the Council should be provided 2 days prior to the meeting.

Certification of Erosion and Sediment Control Plans

12. Prior to earthworks commencing, a certificate signed by an appropriately qualified and experienced engineer shall be submitted to the Team Leader, Compliance Monitoring NW1, to certify that the erosion and sediment controls have been constructed in accordance with the updated erosion and sediment control plans required by Condition 5 of this consent.

Certified controls shall include the sediment retention pond and earth bund. The certification for these measures shall be supplied immediately upon completion of construction of those measures. Information supplied if applicable shall include:

- (a) Contributing catchment area,
- (b) Volume of the structure (measured to the crest of the primary spillway),
- (c) Shape of structure (dimensions of structure),
- (d) Position of inlets/outlets, and
- (e) Stabilisation of the structure

Effectiveness / Efficiency of Erosion and Sediment Control Measures and SRP Chemical treatment system

13. The operational effectiveness and efficiency of all erosion and sediment control measures and the SRP chemical treatment system shall be maintained throughout the duration of earthworks activity, or until the site is permanently stabilised against erosion.

Deposition of earth, mud, dirt or other debris

14. There shall be no deposition of earth, mud, dirt or other debris on any public road or footpath resulting from earthworks activity on the subject site. In the event that such deposition does occur, it shall immediately be removed. In no instance shall roads or footpaths be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses or receiving waters.

Advice Note:

- *In order to prevent sediment laden water entering waterways from the road, the following methods may be adopted to prevent or address discharges should they occur.*
- *provision of a stabilised entry and exit(s) point for vehicles*

- *provision of wheel wash facilities*
- *ceasing of vehicle movement until materials are removed*
- *cleaning of road surfaces using street-sweepers*
- *silt and sediment traps*
- *catchpits*

In no circumstances should the washing of deposited materials into drains be advised or otherwise condoned.

It is recommended that you discuss any potential measures with the council's Monitoring Inspector who may be able to provide further guidance on the most appropriate approach to take. Please contact the Team Leader, Compliance Monitoring NW1 on monitoring@aucklandcouncil.govt.nz for more details. Alternatively, please refer to Auckland Council Guideline Document number 005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016, Guideline Document 2016/005 (GD05).

Stabilisation

15. The site shall be progressively stabilised against erosion at all stages of the earthworks activity and shall be sequenced to minimise the discharge of sediment to surface water.

Advice Note:

Earthworks shall be progressively stabilised against erosion during all stages of the earthwork activity. Interim stabilisation measures may include:

- *the use of waterproof covers, geotextiles, or mulching*
- *top-soiling and grassing of otherwise bare areas of earth*
- *aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward.*

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 Team Leader, Compliance Monitoring NW 1 for more details. Alternatively, please refer to Auckland Council, Guideline Document number 005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016, Guideline Document 2016/005 (GD05).

Completion or abandonment of earthworks

16. Upon completion or abandonment of earthworks on the subject site all areas of bare earth shall be permanently stabilised against erosion to the satisfaction of the Team Leader, Compliance Monitoring NW 1.

Advice Note:

Should the earthworks be completed or abandoned, bare areas of earth shall be permanently stabilised against erosion. Measures may include:

- *the use of mulching*
- *top-soiling, grassing and mulching of otherwise bare areas of earth*

- *aggregate or vegetative cover that has obtained a density of more than 80% of a normal pasture sward*

The on-going monitoring of these measures is the responsibility of the consent holder. It is recommended that you discuss any potential measures with the Council's monitoring officer who will guide you on the most appropriate approach to take. Please contact the Team Leader, Compliance Monitoring NW 1 for more details. Alternatively, please refer to Auckland Regional Council, Guideline Document number 005, Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016, Guideline Document 2016/005 (GD05).

Construction methodology

17. Prior to any Works a Construction Methodology is to be provided by the Chartered Professional Engineer supervising and certifying the works. The methodology shall include (but not be limited to) plant, resources and materials and their implementation and storage on site. The methodology will include complete silt and sedimentation control plans and their implementation procedures. All works are to comply with the Health & Safety plan to the requirements of the Health and Safety at Work Act 2015. The flood plain is not to be obstructed during or after the works.

Supervision of works

18. The Design and Construction of permanent earth bunds, the placement and compaction of fill material, retaining walls pipe works, Overland flow-paths and building foundations shall be designed and supervised by a suitably qualified engineering professional and in accordance with the report by: Hutchinson Consultants Limited Reference L19785 dated the 14th of December 2016 and the subsequent Development report reference L19785a, dated the 10th of October 2017. Also RFI letter response from Hutchinson Consultants Limited Reference L19785b dated the 19th of December 2017.

Certification of completion of works

19. Certification from a suitably qualified engineering professional responsible for supervising the works shall be provided to the Team Leader, Compliance Monitoring NW1 confirming that the works have been completed in accordance with condition 17 above, within ten (10) working days following completion. Written certification shall be in the form of a geotechnical completion report, producer statement or any other form acceptable to Council.

Earthworks management

20. All earthworks shall be managed to ensure that no debris, soil, silt, sediment or sediment-laden water is discharged from the subject site either to land, stormwater drainage systems, watercourses or receiving waters. In the event that a discharge occurs, works shall cease immediately and the discharge shall be mitigated and/or rectified to the satisfaction of the Team Leader, Compliance Monitoring NW1.

Advice Note:

In accordance with this Condition all earthworks shall be undertaken to ensure that all potential sediment discharges are appropriately managed. Such means and measures may include:

- *catchpit protection*
- *run-off diversions*
- *silt and sediment traps*
- *decanting earth bunds*
- *silt fences*

In no circumstances should the washing of deposited materials into drains be advised or otherwise condoned.

It is recommended that you discuss any potential measures with Council's monitoring officer who will guide you on the most appropriate approach to take. Please contact the Team Leader, Compliance Monitoring NW1 for more details. Alternatively, please refer to Auckland Regional Council, Technical Publication GD05, Erosion & Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region.

Stability

21. All earthworks shall be managed to ensure that they do not lead to any uncontrolled instability or collapse affecting either the site or adversely affecting any neighbouring properties. In the event that such collapse or instability does occur, it shall immediately be rectified.

Seasonal Restriction

22. No earthworks on the site shall be undertaken between 1 May and 30 September in any year, without the prior written approval of the Team Leader, Compliance Monitoring NW1 at least two weeks prior to 30 April of any year. Revegetation/stabilisation is to be completed by 30 April in accordance with measures detailed in GD05 and any amendments to this document.

Accidental Discovery Protocol

23. If at any time during the site works, potential Koiwi (human remains), archaeology or artefacts are discovered, then the following discovery protocol is to be followed:
- All earthworks will cease in the immediate vicinity (at least 10m from the site of the discovery) while a suitably qualified archaeologist is consulted to establish the type of remains;
 - If the material is identified by the archaeologist as human, archaeology or artefact, earthworks must not be resumed in the affected area (as defined by the archaeologist). The Consent Holder must immediately advise the Team Leader, Compliance Monitoring NW1, Heritage New Zealand and Polices (if human remains are found) and arrange a site inspection with these parties.
 - If the discovery contains Koiwi, archaeology or artefacts of Maori origin, representatives from Local Iwi are to be provided information on the nature and location of the discovery; and
 - The Consent Holder shall not commence works until approved by the Team Leader, Monitoring.

Review Condition

24. The conditions of this consent may be reviewed by the Team Leader pursuant to Section 128 of the Resource Management Act 1991, in order:
- (a) To avoid, remedy or mitigate any adverse effect on the environment arising or potentially arising from the exercise of this consent.

Advice notes

1. Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.
2. For the purpose of compliance with the conditions of consent, "the council" refers to the council's monitoring inspector unless otherwise specified. Please contact monitoring@aucklandcouncil.govt.nz to identify your allocated officer.
3. For more information on the resource consent process with Auckland Council see the council's website www.aucklandcouncil.govt.nz. General information on resource consents, including making an application to vary or cancel consent conditions can be found on the Ministry for the Environment's website: www.mfe.govt.nz.
4. The consent holder shall apply for a new wastewater discharge permit if changes are made to the existing wastewater discharge operation on the subject site that fall outside of the scope of the existing discharge permit or the review condition that applies to that permit.
5. If you disagree with any of the above conditions, or disagree with the additional charges relating to the processing of the application, you have a right of objection pursuant to sections 357A or 357B of the Resource Management Act 1991. Any objection must be made in writing to the council within 15 working days of notification of the decision.
6. The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (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 building consent approval. Please check whether a building consent is required under the Building Act 2004.
7. The consent holder is advised that this consent is solely for earthworks and associated drainage. Further consent is required to construct the ponds / dams and for the construction of the future glasshouses within the 1% per cent annual exceedance probability (AEP) floodplain and overland flow paths.

Delegated decision maker:

Name: Helen McCabe

Title: Senior Planner, Resource Consents

Signed:



Date: 26 February 2018

ATTACHMENT 7
SUGGESTED DRAFT CONDITIONS

RESOURCE CONSENT CONDITIONS

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DEFINITIONS

The table below defines the acronyms and terms used in the conditions. Defined terms are capitalised throughout the conditions.

Acronym / Term	Definition / Meaning		
Acute Event Threshold	Catchment	Acute storm event (events equal to or greater than)	Acute Event Threshold (tonnes/acute event)
	Hoteo Inlet	24 hour 10-year ARI event	512
	Mahurangi Harbour	24 hour 30-year ARI event	600
Acute Event Sediment	Total sediment (tonnes) discharged from Project Works over the total Project construction period (excluding total sediment generated by a greater than or equal to 100-year ARI event) above the Acute Event Threshold(s)		
AMP	Adaptive Monitoring Plan		
ARI	Average Return Interval		
AUP(OP)	Auckland Unitary Plan Operative in Part		
Bed	As defined in the RMA		
CAQMP	Construction Air Quality Management Plan		
CEMP	Construction Environmental Management Plan		
CESCP	Construction Erosion and Sediment Control Plan		
CIR	Cultural Indicators Report		
CMA	Coastal Marine Area		
Construction Works	Activities undertaken to construct the Project excluding Enabling Works		
<u>Council</u>	<u>Where any condition refers to the Council, this is to be taken as being the Team Manager – Compliance Monitoring, Auckland Council, or authorised delegate, unless otherwise advised within the condition.</u>		
CTMP	Construction Traffic Management Plan		

Acronym / Term	Definition / Meaning	
Cumulative Sediment	Total sediment (tonnes) discharged from Project Works above the Cumulative Threshold(s) over the total Project construction period minus any Acute Event Sediment	
Cumulative Threshold	Catchment	Cumulative threshold (tonnes)
	Hoteo Inlet	9000 [x total years of Construction Works]
	Mahurangi Harbour	4300 [x total years of Construction Works]
	Oruawharo Inlet	3300 [x total years of Construction Works]
Day(s)	Has the same meaning as “working day” under section 2 of the RMA	
DEB	Decanting earth bund	
Designation	The designation for the Project included in the AUP(OP)	
Enabling Works	Preliminary construction activities as follows: <ul style="list-style-type: none"> • geotechnical investigations (including trial embankments); • formation of access for geotechnical investigations; • establishment of site yards, site offices, site entrances and fencing; • constructing and sealing site access roads; • demolition or removal of buildings and structures; • relocation of services; and • establishment of mitigation measures (such as erosion and sediment control measures, temporary noise walls, earth bunds and screen planting) 	
Erosion Prone Stream	Streams with soft beds (not rock) that are predicted to be subject to flow changes of >15% to peak 2-year and 10-year ARI flows compared to predevelopment	
ESCP	Erosion and Sediment Control Plan	
EWCEMP	Enabling Works Construction Environmental Management Plan	
EWCESCP	Enabling Works Construction Erosion Sediment Control Plan	
EWCOMP	Enabling Works Cultural Monitoring Plan	
EWCTMP	Enabling Works Construction Traffic Management Plan	
GD01	Auckland Council Guideline Document 2017/001: Stormwater Management Devices in the Auckland Region (December 2017), or any subsequent version	

Acronym / Term	Definition / Meaning
GD05	Auckland Council Guideline Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (June 2016), <u>Incorporating Amendment 1</u> , or any subsequent version
Highly Sensitive Receiver (HSR)	Residential dwellings within: <ul style="list-style-type: none"> • 200m of the Designation boundary; • 50m of sealed access roads used for Project Works up to 500 m outside of the Designation boundary; and • 100m of unsealed access roads used for Project Works outside of the Designation boundary.
Incident	A release of contaminants (including sediment) or materials into a waterbody that exceeds typical background levels
Kourawhero Wetland Complex	The wetland complex associated with the Kourawhero Stream as identified on Map 17
Intermittent stream	As defined in the AUP(OP)
Manager	The <u>Team Manager – Compliance Monitoring Resource Consents</u> , of Auckland Council, or authorised delegate
Mana Whenua	<p><u>Maori who can demonstrate customary rights through occupation to resources within the Project designation, and who have responsibilities as kaitiaki over their tribal lands, waterways and other taonga.</u></p> <p>Māori with ancestral rights to resources in the Project area and responsibilities as kaitiaki over their tribal lands, waterways and other taonga</p>
Maximum Open Earthworks Area	Maximum area of earthworks allowed to be open (unstabilised) at any one time
Mitigation Sites	The Mitigation Sites identified on Maps 7 – 12
Permanent stream	As defined in the AUP(OP)
Project	The construction, maintenance and operation of the Ara Tūhono Warkworth to Wellsford Project, which extends from Warkworth to north of Te Hana

Acronym / Term	Definition / Meaning
Project Liaison Person	The person or persons appointed for the duration of the construction phase of the Project to be the main and readily accessible point of contact for persons affected by the construction work
Project Works	All activities undertaken to construct the Project (both Construction Works and Enabling Works) and including ecological and landscape mitigation activities) but excluding operation of the highway
Representative Watercourses	The watercourses set out in Maps 1-6.
RMA	Resource Management Act 1991
SCMP	Stakeholder and Communications Management Plan
SECP	Streamworks Ecological Compensation Plan
Sediment Reduction Activity	Works or activities that reduce sediment discharging into the CMA. Such works or activities may include any Project Works, land retirement (e.g. retirement of commercial plantation forest and/or pasture), planting or other sediment reduction works or activities.
Sediment Reduction Factors	Tonnes of sediment per hectare discharging into the CMA that will be reduced by a Sediment Reduction Activity.
SH1	State Highway 1
SOMP	Stormwater Operations and Maintenance Plan
SRP	Sediment Retention Pond
SSTMP	Site Specific Traffic Management Plan
Stabilisation	The activity to achieve a Stabilised Area
Stabilised, Stabilised Area	<p>Refers to an area inherently resistant to erosion such as rock or an area that has been stabilised after earthworks and is excluded from the definition of Maximum Open Earthworks Area.</p> <p>Stabilisation methods may include use of mulch and/or other woody organic matter, geotextile, the use of hard fill material and exposing rock as set out in GD05 or as approved through conditions or <u>certified CESCPS</u>.</p>

Acronym / Term	Definition / Meaning
	Where vegetation is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once an 80% vegetation cover has been established.
Stage(s)	A specific works area or new land disturbing activity associated with construction of the Project as nominated by the Consent Holder.
Stormwater Management Wetland	A permanent stormwater management device in the form of a constructed wetland designed to manage stormwater runoff volume, flow and/or contaminant loads prior to discharge
Suitably Qualified and Experienced Person	A person (or persons) who can provide sufficient evidence to demonstrate their suitability and competence
Trigger Event	An event in which the following occurs: <ul style="list-style-type: none"> • Greater than 25mm of rainfall over any 24-hour period (as measured by the automatic onsite rainfall devices) where Project Works subject to a CЕССР are not Stabilised • Greater than 15mm of rainfall within an hour period where Project Works subject to a CЕССР are not Stabilised
TSS	Total Suspended Solids
Watercourse	Permanent and intermittent rivers and streams but not ephemeral streams or Wetlands.
Wetlands	Includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions, excluding Stormwater Management Wetlands.

Maps:

Maps 1 – 6	Representative Watercourses
Maps 7 – 12	Mitigation Sites
Map 13	Fauna Habitat and Flyway mitigation area
Map 14 – 16	Bridge Structures in Watercourses
Map 17	Crossing of the Kourawhero Stream and associated wetland complex
Maps 18 – 20	Ecological Sites

General

Consent Lapse and Expiry

- 1 Pursuant to sections 123 and 125(1) of the RMA (and where relevant in accordance with section 116 of the RMA), the lapse and expiry dates for the various resource consents are as set out in Table 1 unless they have been given effect to, surrendered or been cancelled at an earlier date.

Table 1: Resource consent lapse and expiry dates

Ref.	Resource consents	Lapse date	Expiry date
Land disturbance activities			
LUC60354952	Land use (s.9(2)) – earthworks	15 years	Unlimited duration
LUC60354952	Land use (s.9(2)) – vegetation alteration and removal.	15 years	Unlimited duration
LUC60354952	Land use (s.9(2)) – construction of stormwater detention/retention ponds	15 years	Unlimited duration
Works in watercourses and wetlands			
LUS60354955	Land use (s.13) - new structures in, on, under or over the bed of rivers, streams (including intermittent streams) and wetlands.	15 years	35 years from the date of commencement
LUS60354955	Water permit (s.14) - diversion and temporary damming of water	15 years	35 years from the date of commencement
WAT60354953	Water permit (s.14) - diversion of intermittent and permanent watercourses and associated disturbance and sediment discharge throughout the Project area during construction and operation.	15 years	35 years from the date of commencement
Diversion of groundwater			
WAT60355184	Water permit (s.14) - diversion of groundwater and dewatering construction and operation.	15 years	35 years from the date of commencement
Diversion and discharge of stormwater			
WAT60356979	Water permit (s.14) - diversion of stormwater associated with new permanent impervious surfaces.	15 years	35 years from the date of commencement

Ref.	Resource consents	Lapse date	Expiry date
DIS60354954	Discharge permit (s.15) - discharge of stormwater runoff from new permanent impervious surfaces into or onto land or water.	15 years	35 years from the date of commencement
LUC60355185	Land use (s.9(2)) – development of all new impervious surfaces for high use roads within the Project area.	15 years	Unlimited duration
Discharges to air			
DIS60355186	Discharge permit (s.15) – temporary discharges to air during construction	15 years	15 years from the date of commencement

Review

- 2 These conditions may be reviewed by the Manager under section 128 of the Act, by giving notice pursuant to section 129 of the Act, at any time within six months of the first, second, third, fourth, and fifth anniversaries of the date of commencement of the construction of the Project authorised by this consent:
 - a. To deal with any adverse effect on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
 - b. To review the adequacy of any monitoring.

Management plans

- 3 The Requiring Authority shall prepare, submit to Auckland Council, have certified and implement the resource consent management plans in accordance with Table 2 and the specific resource consent conditions which apply to each management plan.
- 4 The Consent Holder may prepare management plans in parts or in Stages to address specific activities or to reflect the staged implementation of the Project Works.
- 5 ~~If no response is received from the Manager within the response time set out in Table 2, the management plan shall be deemed to be certified.~~
- 6 The Consent Holder shall not commence Project Works within the area to which a management plan applies until the required management plan(s) has been certified. ~~or is deemed to be certified.~~
- 7 The Consent Holder may seek to amend a management plan in accordance with the process prescribed for the plan in Table 2.

Table 2: Management Plan Table

Management Plan	Decision Pathway	When to submit	Response time from Manager	Duration for implementation
Construction Environmental	To Manager for Information	At least 20 days prior to start of Construction Works	N/A	Duration of Construction Works
Enabling Works Construction Environmental	To Manager for Information	At least 20 days prior to start of Enabling Works	N/A	Duration of Enabling Works
Erosion and Sediment Control	Certified by Manager	Prior to start of Construction Works	Within 20 Working Days	Duration of Construction Works
Chemical Treatment	Certified by Manager	Prior to start of Construction Works	Within 10 Working Days	Duration of Construction Works
Construction Erosion and Sediment Control	Certified by Manager	Prior to start of Construction Works for specific area and/or activity	Within 10 Working Days	Duration of specific works and/or activity
Enabling Works Construction Erosion and Sediment Control	Certified by Manager	Prior to start of Enabling Works	Within 20 Working Days	Duration of Enabling Works
Adaptive Monitoring	Certified by Manager	Prior to start of Construction Works	Within 10 Working Days	Duration of Construction Works
Sediment Reduction Factors methodology	Certified by Manager	Prior to start of Construction Works	Within 20 working days	N/A
<u>Streamworks Ecological Effects Management Plan (SEEMP) Compensation</u>	Certified by Manager	Prior to <u>start of Construction Works</u> Project becoming operational	Within 20 working days	N/A
<u>Wetland Ecological Effects</u>	<u>Certified by Manager</u>	<u>Prior to start of Construction Works</u>		<u>During construction and for 5 years post planting or full</u>

Management Plan	Decision Pathway	When to submit	Response time from Manager	Duration for implementation
<u>Management Plan (WEEMP)</u>				<u>canopy closure is achieved</u>
<u>The Wetland Monitoring Plan</u>	<u>Certified by Manager</u>	<u>Prior to Wetland monitoring at least 3 years prior to Project Works</u>		<u>During construction and for 3 years post construction</u>
<u>Native Freshwater Fish Capture and Relocation Plan (NFFCRP)</u>	<u>Certified by Manager</u>	<u>Prior to start of streamworks</u>		<u>Prior to construction/enabling works period</u>
<u>Annual Mitigation and Offset Plan (AMOP)</u>	<u>Certified by Manager</u>	<u>30 June annually</u>		<u>During construction</u>
Stormwater Operations and Maintenance	Provided to Manager for information	Prior to operation of stormwater treatment devices	N/A	<u>Throughout operation of Project</u>
Construction Air Quality	To Manager for Certification	Prior to start of construction works	<u>Within 20 working days</u>	<u>Duration of Construction Works</u>

Mana Whenua

Cultural Indicators Report

- 8 At least 12 6 months prior to start of detailed design of the Project, the Consent Holder shall invite Mana Whenua to prepare a Cultural Indicators Report for the Project, or to nominate a person or organisation to prepare a Cultural Indicators Report on their behalf. The Cultural Indicators Report shall be completed 6 months prior to the start of the detailed design process. The purpose of the Cultural Indicators Report is to assist with the protection and management of Ngā Taonga Tuku Iho (treasures handed down by our ancestors) during Construction Works.
- 9 The Cultural Indicators Report should:
- Identify cultural sites, landscapes and values that have the potential to be affected by Construction Works;

- b. Set out the desired outcomes and recommended methods for management of potential effects on cultural values;
- c. Identify cultural indicators of cultural stream health as relevant to the Construction Works;
- d. Set out recommended methods to measure the effects on identified cultural indicators during Construction Works;
- e. Identify opportunities for restoration and enhancement of Mauri and mahinga kai within the Project area; and
- f. Identify cultural values that should be acknowledged in the development of the SECP, and the Cultural Monitoring Plan for the Construction Works.

10 The Consent Holder shall discuss and have regard to the recommended methods set out in the Cultural Indicators Report with Mana Whenua and implement the methods where practicable to do so.

11 Conditions 9 and 10 will cease to apply if:

- a. Mana Whenua have been invited to prepare a Cultural Indicators Report at least 12 months prior to start of Construction Works; and
- b. Mana Whenua have not provided a Cultural Indicators Report within six months prior to start of Construction Works.

Cultural Monitoring Plan (Construction)

12 At least 18 months prior to start of Construction Works, the Consent Holder shall prepare a Cultural Monitoring Plan. The plan shall be prepared by a Suitably Qualified and Experienced Person who is identified in collaboration with Mana Whenua. Collaboration shall be completed within 30 Days of initiation by the Requiring Authority. The purpose of the cultural monitoring plan is to identify methods for undertaking cultural monitoring.

13 The Cultural Monitoring Plan shall include:

- a. Requirements for formal dedication or cultural interpretation to be undertaken prior to start of Construction Works in areas identified as having significance to Mana Whenua;
- b. Requirements and protocols for cultural inductions;
- c. Identification of representative activities, sites and areas where cultural monitoring is required during particular Construction Works and the scope of cultural monitoring as appropriate to reflect the timing, location and scale of the Construction Works; and
- d. Identification of personnel to undertake cultural monitoring, including any geographic definition of their responsibilities. The Cultural Monitoring Plan shall align with the requirements of other conditions of the resource consents and Designation for the Project which require monitoring during Construction Works.

14 If Enabling Works involving soil disturbance are undertaken, at least 6 months prior to the start of Enabling Works, the Consent Holder shall prepare an Enabling Works Cultural Monitoring Plan (EWCMP). The plan shall be prepared by a Suitably Qualified and Experienced Person who is identified in collaboration with Mana Whenua. Collaboration shall be completed within 30 Days of initiation by the Requiring Authority.

- 15 The Consent Holder shall prepare the EWCMP in general accordance with the Cultural Monitoring Plan Conditions 12 to 13 but with the scope modified as appropriate to reflect the timing, location and scale of the Enabling Works.

Construction Environmental Management Plan

- 16 The Consent Holder shall prepare a Construction Environmental Management Plan (CEMP) prior to commencement of Construction Works to set out management procedures and methods to be implemented to ensure ongoing compliance with these conditions and to address complaints and incidents in a timely manner during Construction Works.
- 17 The CEMP shall be prepared, having regard to the NZ Transport Agency Guideline for Preparing Environmental and Social Management Plans (April 2014), or any subsequent version including:
- a. Roles and responsibilities of construction management staff, including the overall manager responsible for environmental management.
 - b. An outline construction programme, proposed staging, proposed hours of work and methods to inform Auckland Council of upcoming Construction Works, which shall occur at annual intervals or key construction times throughout the duration of Construction Works.
 - c. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).
 - d. Methods and systems to inform and train all persons working on the site of potential environmental sensitivities and how to comply with these conditions.
 - e. Measures to be adopted to maintain the land affected by Construction Works in a tidy condition in terms of disposal / storage of rubbish, storage and unloading of construction materials and similar activities.
 - f. The location of construction site infrastructure including site offices, site amenities, contractors' yard access, equipment unloading and storage areas, contractor car parking and security.
 - g. Means of providing for the health and safety of the general public.
 - h. Procedures for the refuelling and maintenance of plant and equipment to avoid discharges of fuels or lubricants to Watercourses.
 - i. Measures to address the storage of fuels, lubricants, hazardous and/or dangerous materials, along with contingency procedures to address emergency spill response(s) and clean up.
 - j. Procedures for responding to complaints about Construction Works;
 - k. Procedures for Incident management.
 - l. Methods for updating the CEMP as required.
- 18 The CEMP shall be prepared in consultation with Mana Whenua and the owner of the commercial plantation forest (Mahurangi Forest) located west of SH1, with respect to construction activities which directly interface with forestry operations. If the Consent Holder has not received any comment from the owner of the Mahurangi Forest within 20 Days of providing the CEMP to them, the Requiring Authority may consider the relevant party has no comments.

Enabling Works Construction Environmental Management Plan

- 19 Where Enabling Works are to be undertaken, the Consent Holder shall prepare a site or activity specific Enabling Works Construction Environmental Management Plan (EWCEMP) prior to commencing the relevant Enabling Works.
- 20 The EWCEMP shall be prepared in general accordance with Condition 17, with the scope modified to be commensurate with the scale and effects of the proposed works.

Erosion and Sediment Control

Erosion and Sediment Control (ESC) Outcomes

- 21 The Consent Holder shall design and construct the Project to achieve the following erosion and sediment control (ESC) Outcomes (*ESC Outcomes*):
- a. Prioritise minimisation of sediment generation by:
 - i. minimising the volume and area of the proposed earthworks required for the Project through earthworks design appropriate to slope and expected soil types and geology;
 - ii. maximising the effectiveness of ESC measures associated with earthworks by minimising potential for sediment generation and sediment yield; and
 - iii. Minimisation of discharges of all construction water related contaminants.
 - b. Monitor sediment yields and assess and remedy effects on freshwater and marine environments at the prescribed thresholds in Conditions 34 to 42.
- 22 The Consent Holder shall develop, construct and maintain all ESC plans and devices to achieve the requirements of GD05, except where otherwise certified by the Manager or a specific standard is detailed in a condition of this consent, in which case the specific standard shall apply.

Erosion and Sediment Control Plan

- 23 The Consent Holder shall prepare an Erosion and Sediment Control Plan (ESCP) for the Construction Works for the entire Project prior to Construction Work identifying the construction water management measures to be used on the Project to meet the ESC Outcomes.
- 24 The ESCP shall be prepared by a Suitably Qualified and Experienced Person and shall include the following as a minimum:
- General*
- a. Methods of achieving the ESC Outcomes;
 - b. Identification of a suite of appropriate structural and non-structural erosion and sediment control measures to be installed prior to and during all Construction Works for representative parts of the Project, including earthworks, and works within watercourses;
 - c. Identification of a process and methods to ensure that offsite (clean) water runoff is prevented from entering active work areas, including the use of clean water diversion (CWD) channels and/or bunds to divert runoff;
 - d. Identification of a process, methods and measures to ensure that any sediment laden runoff will be captured and directed to an appropriate sediment control device, including the use of dirty water diversion (DWD) channels and/or bunds;

- e. The approach and procedures for ensuring advance warning of a rainfall event;
- f. The methodology for identifying and recording the occurrence of the following rainfall events:
 - i. >24 hour 10-year ARI event in the Hoteo Inlet; and
 - ii. >24 hour 30-year ARI event in the Mahurangi Harbour
- g. The procedures for decommissioning the erosion and sediment control measures;
- h. The procedures for determining staging and sequencing of earthworks to limit the length of time and extent of exposed/disturbed soil and the details of progressive Stabilisation of these earthwork areas;
- i. A procedure to establish and define minor changes to erosion and sediment control, which would not require further certification by the Manager prior to implementation; and
- j. Methods for amending and updating the ESCP as required.

Responsibilities

- k. Identification of:
 - i. Appropriately qualified and experienced staff to manage the erosion and sediment control devices, associated maintenance procedures and monitoring requirements;
 - ii. Staff directly responsible for supervising installation, maintenance and decommissioning of erosion and sediment control devices and the associated works;
 - iii. A chain of responsibility for both the Project and its stages, including the overall manager (with authority to stop works), for managing erosion and sediment control on site;
 - iv. An erosion and sediment control management team (including representatives from the contractor, Council and the Consent Holder) to meet and review erosion and sediment control practices and procedures as required; and
 - v. Training requirements for staff to assist with their understanding of the environmental effects that need to be managed and the requirements of the consent conditions, including specific training prior to ~~to~~ at the start of Construction Works in any Stage.

Incident management

- l. Identification of the process to ensure compliance with Condition 48 and 49.

Chemical Treatment Management

- 25 A Chemical Treatment Management Plan (ChemTMP) which shall be prepared by a Suitably Qualified and Experienced Person and shall include as a minimum:
 - a. Specific design details of the flocculation treatment system including:
 - i. a rainfall or flow activated flocculation system shed for all sediment retention ponds (SRPs), decanting earth bunds (DEBs) and any other impoundment systems utilised on site;
 - ii. Confirmation that all SRPs, DEBs or container impoundment systems, maintain a sufficient volume of chemical to provide appropriate flocculation throughout the duration of a 24 hour 30-year ARI event.
 - iii. ~~all SRPs having a contributing catchment area greater than 2ha to have two flocculation sheds;~~

- ~~iv. a rainfall or flow activated flocculation shed for all decanting earth bunds (DEBs) utilised on site that have contributing catchments over 500m²; and~~
- ~~v. a rainfall activated flocculation system (such as flocculation socks) for all other decanting earth bunds and any other sediment detention or flow device system as may be employed on site;~~
- b. Monitoring, maintenance (including post storm) and a contingency programme (including a record sheet) for the flocculation treatment system;
- c. Results of any initial treatment trials and details of optimum dosage (including assumptions) specific to a given CЕССР;
- d. Consideration of the use of organic flocculants where practicable, provided that the most effective flocculent in terms of sediment removal is ~~shall be~~ selected based on the results of any initial treatment trials;
- e. A spill contingency plan;
- f. Details of the person or bodies that will hold responsibility for the operation and maintenance of the chemical treatment system and the organisational structure which will support this system; and
- g. Details for the checking and calibration of dosing and monitoring equipment.

Erosion and sediment control standards

- 26 The Consent Holder shall design and construct all erosion and sediment control measures and devices to achieve compliance with Conditions 22 and 24 and with the following design requirements:
- a. All sediment retention ponds and decanting earth bunds shall be designed, constructed and maintained at a volume equivalent to or greater than 3% of the catchment area (i.e. 300m³ per 1ha of contributing catchment) unless otherwise varied through an approved CЕССР;
 - b. Silt fence design shall be in accordance with ~~TP90~~ GD05 and NZ Transport Agency Erosion and Sediment Control Guidelines for State Highway Infrastructure (Sept 2014), or any subsequent version, with a return upslope to provide robustness of the device;
 - c. Clean and dirty water diversion channels, shall be sized to accommodate the flow from a 100 year ARI storm event where practicable;
 - d. Sufficient and safe access to enable monitoring and maintenance (including forebay clean out) shall be provided at all times to all sediment retention ponds and decanting earth bunds.

Construction Erosion and Sediment Control Plans for Stages

- 27 The Consent Holder shall prepare CЕССРs for each Stage of the Project, or a specific activity to set out how the requirements of the certified ESCP and the ESC standards in Condition 26 will be met for that Stage or activity.
- 28 The CЕССРs shall be prepared by a Suitably Qualified and Experienced Person and shall contain as a minimum:
- a. Methods of achieving the ESC Outcomes;
 - b. Identify how the requirements of the certified ESCP and the standards in Condition ~~26~~ 27 will be met (where applicable); and

- ~~c. Include a schedule of current and planned open earthworks areas as applicable to that CЕССР catchment location at the time of preparation of that CЕССР.~~
- d. Identify alternative Stabilisation measures based on project specific field trials to demonstrate its effectiveness in Stabilisation. The Project specific trials and results must be submitted to the Manager in that CЕССР.
- e. Confirm catchment boundaries.
- f. Confirm the location of the Construction Works, and the boundary and extent of works for that specific CЕССР.
- g. Provide design criteria, typical and site-specific details of ESC measures, including supporting calculations, contributing catchment area, retention volume of structure, dimensions of structure and design drawings of erosion and sediment controls.
- h. Provide identification of risk and sensitive area locations and the details of management (including contingency measures) around these aspects.
- i. Confirm chemical treatment design and details consistent with the ChemTMP certified under the ESCP.
- ~~j. Provide a programme for managing ongoing non-Stabilised areas.~~
- k. Provide design details for managing the treatment, disposal and/or discharge of contaminants (e.g. concrete wash water).
- l. Provide an estimated sediment yield for the Stage of work.
- m. Provide details of construction methods to be employed, including timing and duration. This shall include:
 - i. Streamworks methodologies;
 - ~~ii. Programme for managing exposed area, including progressive Stabilisation considerations;~~
 - iii. Identification of areas susceptible to erosion and sediment generation or high-risk areas including specific measures for managing this risk;
 - ~~iv. Identification of contingency measure; and~~
 - v. Access and maintenance provisions.
- n. Include plans showing contour information at suitable intervals, cut and fill operations, erosion and sediment controls, stream diversions, discharge points to Watercourses.
- ~~o. Provide procedures for decommissioning of ESC measures.~~
- ~~p. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).~~

CЕССР As-built certification

- 29 That within 2 weeks of ~~Prior to~~ Construction Works in the Stage that the CЕССР applies commencing (excluding the construction of the erosion and sediment controls themselves) as-built plans signed by a Suitably Qualified and Experienced Person shall be submitted to the Manager for information and as confirmation that the erosion and sediment control measures for that CЕССР have been constructed in accordance with the certified CЕССР.

Enabling Works

- 30 The Consent Holder shall prepare specific CЕССPs for the Enabling Works for the Project. The CЕССPs shall be prepared by a Suitably Qualified and Experienced Person and shall address the requirements of a CЕССР under Conditions 27 and 28 but with the scope modified as appropriate to reflect the timing, location and scale of the Enabling Works.

Adaptive Monitoring Programme

- 31 Prior to Construction Works commencing, the Consent Holder shall have a certified Adaptive Monitoring Plan (AMP) to:
- a. ensure the ESC Outcomes are met;
 - b. enable accurate estimation calculation of Acute Event Sediment and Cumulative Sediment Net Sediment yields throughout the duration of the earthworks phase of the Project; and
 - c. ensure continuous improvement as to the effectiveness of the erosion and sediment controls employed on site.
- 32 The AMP shall be prepared by a Suitably Qualified and Experienced Person and shall include methods for undertaking:
- a. Ongoing site visual assessments of all erosion and sediment devices;
 - b. Ongoing monitoring of devices and processes, including flocculation;
 - c. Identification of four representative SRPs or selected DEBs as approved by the Council;
 - d. Automatic onsite rainfall monitoring using at least 2 rain gauges, including automatic notification of a Trigger Event occurring;
 - e. Pre-Trigger Event inspections including outlining maintenance procedures and installing any additional measures required in response to the severity of the forecasted Trigger Event (including Stabilisation);
 - f. Trigger Event sampling, monitoring and response procedures in accordance with Conditions 34 and 36;
 - g. Outflow monitoring (measured in m³/sec) of the discharges of a representative number (at least four SRPs or DEBs) with:
 - i. two SRPs or DEBs to best represent a high-risk location of the earthworks on the Project (steeper locations or those with a catchment greater than 5ha); and
 - ii. two SRPs to represent the design and construction for general earthwork activities.
 - h. Automatic sediment sampling at the same selected SRPs to measure outflow TSS (or an alternative water quality parameter that can be related to suspended solids concentrations).
 - i. Monitoring of TSS, or alternative water quality parameter that can be correlated to suspended solid concentrations, in the freshwater receiving environment, upstream and downstream of the most upstream and downstream discharges within the area of Project works in each of the Hoteo, Mahurangi and Oruwharo catchments; and
 - j. An analysis of the monitoring detailed in conditions 32(g) (flow) and 32(h) (TSS) to allow for calculation of cumulative sediment to the Hoteo, Mahurangi and Oruwharo catchments and for calculating Acute Event Sediment during the following events:
 - i. 24 hour 10-year or greater ARI event in the Hoteo Inlet (with a sediment load of >512 tonnes); and
 - ii. 24 hours 30-year or greater ARI event in the Mahurangi Harbour (with a sediment load of >600 tonnes).
- 33 The Consent Holder shall keep a record of implemented adaptation methods and provide the record to the Manager on request.

Monitoring effects of a Trigger Event Procedures

- 34 During Within 12 hours of a Trigger Event occurring, the Consent Holder shall complete a Trigger Event monitoring programme which includes the collection of take grab samples

(unless it ~~is shall~~ be unsafe or dangerous to do so) to measure TSS, or alternative water quality parameter that can be related to suspended solid concentrations, at discharge points of all SRPs and a selection of DEBs (a minimum of 50% of the operational DEBs) at the time of a discharge, and in the freshwater receiving environment, upstream and downstream of the area of Project Works in each of the Hoteo, Mahurangi and Oruwharo catchments. During Trigger Event monitoring the Consent Holder must instruct a Suitably Qualified Person to undertake the following additional procedures:

- a. Inspect and record observations of the earthworks site and erosion and sediment control devices to identify any problems or activities likely to have contributed to an increased sediment discharge.
 - b. Remedy any identified problems, and implement any further controls on activities or areas of the site that are likely to contribute to sediment discharge into the receiving environment; and
 - c. Notify the Council of the Trigger Event occurring, and any actions undertaken.
- 35 ~~Within 12 hours of a Trigger Event occurring, or as soon as practicable, the Consent Holder shall investigate erosion and sediment control measures to determine whether there has been a discharge. Within 2 weeks of Trigger Event Procedures having been undertaken, provide the Council with an Adaptive Monitoring Programme Report (AMP Report), summarising the TSS results, or alternative water quality parameter that can be related to suspended solid concentrations, of the automatic and grab samples collected during the Trigger Event, including any observations made and actions taken to remedy improper ESC device performance.~~
- 36 ~~In the event of a discharge occurring as a result of a Trigger Event, the Consent Holder shall instruct a Suitably Qualified Person to take the following actions:~~
- a. ~~Inspect the earthworks site and erosion and sediment control devices to identify any problems or activities likely to have contributed to an increased sediment discharge;~~
 - b. ~~Take a grab sample of each discharge from a sediment control device to determine TSS, or alternative water quality parameter that can be related to suspended solid concentrations, concentrations (unless it will be unsafe or dangerous to do so);~~
 - c. ~~Record observations and take a manual grab sample that can be related to suspended solid concentrations, , or alternative water quality parameter that can be related to suspended solid concentrations, in the freshwater receiving environment, upstream and downstream of the most upstream and downstream discharges within the area of Project Works; and~~
 - d. ~~Remedy any identified problems, and implement any further controls on activities or areas of the site that are likely to contribute to sediment discharge into the receiving environment; and~~
 - e. ~~Notify the Manager of the Trigger Event occurring, and any actions undertaken.~~

Sediment reduction activities

- 37 Where there is Acute Event Sediment and/or Cumulative Sediment (greater than zero) (determined using the data collected from the representative SRPs or DEBS as required by conditions 37 to 42), the Consent Holder shall:
- a. for Acute Event Sediment, implement Sediment Reduction Activities to offset the effects of that sediment within 25 years of the date of the Acute Event that caused the Acute Event Sediment; and
 - b. For Cumulative Sediment, implement Sediment Reduction Activities to offset the effects of that sediment within 25 years of the Project becoming operational.
- 38 A Suitably Qualified and Experienced Person shall prepare a methodology identifying:
- a. Sediment Reduction Factors for any Sediment Reduction Activities; and
 - b. Any measures necessary for the Sediment Reduction Activities to achieve the predicted sediment reduction over a 25-year period.
- 39 The Sediment Reduction Factors shall be calculated by the Suitably Qualified and Experienced Person using:
- a. The methodology set out in Appendix 1; or
 - b. Other best practice methods for assessing sediment generation and identifying Sediment Reduction Factors.
- 40 The methodology for calculating Sediment Reduction Factors for any Sediment Reduction Activities and related measures to achieve the predicted sediment reduction over a 25-year period, shall be provided to the Manager for certification prior to commencement of Construction Works.
- 41 The following information shall be provided to the Manager within six months of the date of an Acute Event occurring to demonstrate how condition 37(a) will be met:
- a. A record of the Acute Event Sediment including any exceedance beyond the Acute Event Thresholds for each catchment.
 - b. Documentation outlining the location where Sediment Reduction Activities have been applied and how they will offset the Acute Event Sediment within 25 years of the relevant Acute Event.
- 42 The following information shall be provided to the Manager within six months of the Project becoming operational to demonstrate how condition 37(b) will be met:
- a. A record of the Cumulative Sediment, including any exceedance beyond the Cumulative Thresholds for each catchment.
 - b. Documentation outlining the location where Sediment Reduction Activities have been applied and how they will offset the Cumulative Sediment within 25 years of the Project becoming operational.

Advice note: For the avoidance of doubt, in the event that the Cumulative Sediment Threshold is less than the Acute Sediment for which Sediment Reduction Activities have been provided under condition 37, no further Sediment Reduction Activities will be required for the Project

Earthworks Season Restrictions

- 43 The Consent Holder shall not undertake earthworks activities between ~~30 April and 1 October~~ 1 May and 30 September (winter period) in any one year unless otherwise approved by the Manager.

Maximum Open Earthwork Area limits

- 44 ~~Unless otherwise approved in writing by the Council, approved in accordance with condition 46,~~ the Maximum Open Earthworks Area for Project Works within the Hoteo catchment at any one time is 75ha; the Maximum Open Earthworks Area for Project Works within the Oruawhoro catchment at any one time is 25ha; and the maximum open area for Project Works within the Mahurangi catchment at any one time is 43.3ha.
- 45 ~~Unless approved in accordance with condition 46, the Maximum Open Earthworks Area for Project Works within the Oruawhoro catchment at any one time is 25ha.~~
- 46 Any request to the Manager for approval to open an earthworks area that is greater than the limits stated in condition 44 ~~75 ha within the Hoteo catchment and/or 25 ha within the Oruawhoro catchment,~~ shall include the following information:
- The proposed earthworks programme and ESC measures implemented;
 - A comparison showing the modelled sediment yields compared to the actual sediment yields generated to date;
 - ~~A minimum of 12 months of m~~ Monitoring data to support an increased earthworks area including ~~This must include~~ water quality results from the AMP ~~at least four automated sampling devices that gathered data from a comparable catchment; and~~
 - ~~Identification of areas for continuous improvement opportunities (e.g. modifications to current ESC practice) for future earthworks.~~

Operational effectiveness and efficiency

- 47 The Consent Holder shall maintain all ESC measures to ensure they continue to achieve their design function throughout the duration of land disturbance and earthworks activity, and until the relevant site is Stabilised.

Incident Management

- 48 The Consent Holder shall notify the Manager within one Day or as soon as practicable after identifying that any contaminants (including sediment) or materials that exceed typical background levels have been released in the undertaking of the Work and which have entered any water body due to any of the following incidents:
- discharges from non-stabilised areas that are not treated by erosion and sediment control measures as required under this consent; and/or
 - failure of any erosion and sediment control measures;
 - discharge of a hazardous substances, including cement, to a water body;
 - failure of any temporary stream diversion;
 - un-consented removal, loss or damage to vegetation or other habitats;
 - any other incident which either directly or indirectly causes, or is likely to cause, adverse ecological effects in any water body that is not authorised by a resource consent held by the Consent Holder; and

- g. Any other incident which is likely to adversely affect the quality of the water used for public reticulated water purposes.

This notification shall be either by telephone or email, or via an alternative method as agreed with the Manager.

- 49 If any of the incidents identified in condition 48 occur, the Consent Holder shall :
- a. re-establish control measures where these have failed or have not been implemented in accordance with the relevant management plan as soon as practicable;
 - b. liaise with the Manager to establish what remediation or rehabilitation is required and whether such remediation or rehabilitation is practical to implement;
 - c. carry out any remedial action as required by and to the satisfaction of the Manager; and
 - d. maintain a permanent record of the incident at the site, which shall include the date and time of the incident, the nature, manner and cause of the release of the contaminants, weather conditions at the time of the incident and the steps taken to prevent any further incidents and to remedy any adverse effects.

This notification (if not in person) shall be either by telephone or email, or via an alternative method as agreed with the Team Leader.

Stabilisation and decommissioning

- 50 The Consent Holder shall stabilise sites against erosion as soon as practicable, and in a progressive manner, as earthworks are completed over various areas of Project Works.
- 51 If an area is not subject to earthworks activity (including cut and fill batters) for a 14-day period, or time otherwise certified with the Manager within a CЕССР, the area shall be stabilised.

Completion or abandonment of works

- 52 Upon completion or abandonment of earthworks on the Project site, ~~including end of earthworks season,~~ the Consent Holder shall stabilise all areas of bare earth ~~shall be Stabilised~~ against erosion to the satisfaction of the Manager.
- 53 ~~The Consent Holder shall give notice to the Manager on completion of Construction Works for each specific area and/or activity and prior to any ESC measures being removed.~~

Works in a watercourses and wetlands and freshwater ecology

Crossing watercourses - Location of bridge structures

- 54 The Consent Holder shall design and construct the Project to include bridge structures with no piers in the Bed of the following Watercourses (as identified on Maps 14 – 16):
- a. Mahurangi River (Left Branch);
 - b. Hōteo River;
 - c. Waitaraire Stream; and
 - d. Maeneene Stream.

Crossing of the Kourawhero Stream and Kourawhero Wetland Complex

- 55 Prior to commencing the Wetland monitoring the Consent Holder shall provide to Council for certification a Wetland Monitoring Plan. The Wetland Monitoring Plan shall provide at a

minimum the following to enable a suitable level of detail with which to monitor the effects of the Project on the Kourawhero Wetland Complex:

- a. The methods for monitoring water table levels;
- b. The number and locations of water level sampling sites;
- c. The methods for delineating the Wetland extents in accordance with best practice;
- d. The methods for assessing Wetland condition in accordance with best practice; and
- e. The timing and frequency of monitoring events.

The Consent Holder shall monitor over a ~~12-month~~ three year period (or a shorter period as agreed with Council) prior to starting Project Works, Kourawhero Wetland Complex (as identified in Map 17) to confirm pre-construction water table levels, ecological condition and Wetland extent in accordance with the certified Wetland Monitoring Plan. The results of the monitoring shall be provided to the Manager for information.

- 56 The Consent Holder shall design and construct bridges, structures, culverts and embankments to cross the Kourawhero Stream to minimise change to the Kourawhero Wetland Complex and to maintain the pre-construction water table level, Wetland extent, and Wetland condition, as far as practicable, which shall include:
- a. A bridge over the Kourawhero Stream with no piers in the Bed in the section of stream identified on Map 17 as “Section of Kourawhero Stream to be bridged”; and
 - b. Minimising intrusion of diversion channels into or through the Kourawhero Wetland Complex.

New Condition (56a)

The Consent Holder shall undertake annual monitoring in accordance with the Wetland Monitoring Plan until 3 years following completion of the Project Works. Should the monitoring indicate a loss in wetland extent or condition that has not been considered in the preparation of the Wetland Ecological Effects Management Plan required by condition 55 the Consent Holder shall provide further mitigation and/or offset to manage the additional adverse effects in accordance with condition 55.

Watercourse design requirements

- 57 The Consent Holder shall design and construct all permanent Project Works in or over any Watercourse (for example, all permanent bridges, culverts and stream diversions) to allow for capacity for 100-year ARI flood event with minimal scour and erosion to road structures eg culverts, bridges and embankments.
- 58 The Consent Holder shall design and construct all watercourse ~~stream~~ diversions that are contributing towards mitigation and/or offset of effects to have natural watercourse ~~stream~~ forms and riparian planting where the diverted streams are permanent and supporting fish habitats. The watercourse ~~stream~~ diversions shall be designed by Suitably Qualified and Experienced Persons. The diversions shall be designed to achieve the outcomes anticipated in the application material including:

- a. At least equivalent ecological function and habitat value to that of the potential values of the watercourse being diverted, demonstrated using the Stream Ecological Valuation methods (Auckland Council Technical Report 2016/023 and Technical Report 2011/009);
- b. Being like for like in regard to watercourse hydrological conditions and substrate; and
- c. Including riparian vegetation extending 10m on either side of the channel.

Advice Note:

Condition 58 does not apply to cut off drains and vertically lifted channels that do not contribute towards the mitigation or offset quantum.

Permanent culvert design

- 59 The Consent Holder shall design and construct permanent culverts to:
- a. Minimise the risks of non-performance of the culvert, such as blockage, taking into account the risk of a vegetation/soil/rock debris flow; and
 - b. Incorporate energy dissipation and erosion control to minimise the occurrence of bed scour and bank erosion in receiving environments.

Temporary culvert design

- 60 The Consent Holder shall design and construct temporary culverts in any watercourse (for example, all temporary bridges, culverts and stream diversions) to allow for the 100-year ARI event (by primary structure or overland flow paths) with minimal scour and erosion unless otherwise certified by the Manager.

Culvert design – fish passage and migrating fish

- 61 The Consent Holder shall provide fish passage in accordance with best practice in all temporary and permanent culverts and Stormwater Management Wetlands unless deemed unnecessary or impracticable by a Suitably Qualified and Experienced Person.
- 62 Where fish passage is deemed unnecessary or impracticable, appropriate data and rationale for the decision shall be provided for certification by the Manager.

Advice Note:

Certification of this condition does not absolve the Consent Holder from any obligations under any other Statute or Act.

Design certification – permanent structures in Watercourses and Wetlands

- 63 The Consent Holder shall provide drawings of the detailed design of permanent bridges, culverts to be constructed in or over watercourses and wetlands, and watercourse stream diversions to be constructed in or over Watercourses and Wetlands, to the Manager for certification at least 30 Days prior to the start of construction of the relevant structures. The drawings shall be accompanied by a written report prepared by a Suitably Qualified and Experienced Person ~~Expert~~ setting out how the design requirements of conditions 54 and 56 to 61 have been met and the rationale for any departures from those requirements. ~~If a response has not been received from the Manager within 20 Days following the submission of the design, the design shall be deemed to be certified.~~ The Consent Holder shall construct the Project in general accordance with the certified design.

Erosion Prone Streams: Pre-construction monitoring

- 64 The Consent Holder shall instruct a Suitably Qualified and Experienced Person to undertake pre-construction monitoring to identify all Erosion Prone Streams within the Project area prior to the start of Construction Works.
- 65 The pre-construction monitoring of Erosion Prone Streams shall include an inspection of all Erosion Prone Streams to record all erosion areas (supported by photographs and/or video footage). The purpose of monitoring Erosion Prone Streams is to identify the pre-construction condition of the Erosion Prone Stream to be used as a baseline against which to measure construction effects and identify any post-construction remedial measures.
- 66 The Consent Holder shall provide the results of the pre-construction baseline surveys and monitoring to the Manager for information, prior to the start of Construction Works.

Erosion Prone Streams: Post-construction monitoring

- 67 The Consent Holder shall undertake monitoring of Erosion Prone Streams at six-month intervals for 24 months following completion of Construction Works. The monitoring shall consist of walkovers of Erosion Prone Streams and recording of erosion-prone areas, including photographs.
- 68 If monitoring identifies new erosion that a Suitably Qualified and Experienced Person deems to be attributable to the Project based on the pre-construction condition of the Erosion Prone Stream, rehabilitation and/or remedial action, such as stabilisation of the stream bank or bed, shall be implemented in accordance with the Suitably Qualified and Experienced Person's recommendations.

Diverting Watercourses

- 69 Prior to Project Works within a Watercourse, including the filling of the bed, the Consent Holder shall put in place a diversion or diversions around the area of Project Works for all flows with a primary capacity up to the 20-year ARI flood event, unless an alternative design is certified by the Manager.
- 70 During weather events in excess of the 20-year ARI flood event, up to the 100-year ARI flood event (i.e. flows are greater than the capacity of the existing diversion), the Consent Holder shall put in place a stabilised flow path to minimise the potential for scour or erosion and allow flows to pass safely around or through the area of Project Works with minimum nuisance, damage and sediment generation or discharge.

As-built certification

- 71 The Consent Holder shall provide as-Built Plans certified by a Chartered Professional Engineer confirming that permanent structures in and over Watercourses have been constructed in accordance with the certified design under condition 63 to the Manager within 90 Days of completion of the Construction Works.

Freshwater ecology: Pre-construction monitoring

- 72 The Consent Holder shall survey the Representative Watercourses or other watercourse determined by condition 73 ~~73 for one summer and one winter period~~ prior to

~~commencement of Construction Works prior to~~ Project Works commencing. The survey shall be undertaken and recorded by a Suitably Qualified and Experienced Person:

- a. in accordance with the requirements of Stream Ecological Valuation: Application to Intermittent Streams (Auckland Council Technical Report 2016/023) or Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report 2011/009), depending on the watercourse stream classification; ~~and~~
- b. ~~to confirm representative pre-construction environmental conditions in the Project area, represented by:~~
 - i. ~~sediment quality (concentrations of copper, lead, zinc, TOC and HMW PAHs in both total sediment and the <63µm fraction, plus grain size analysis of the total sediment sample), and sediment depth; and~~
 - ii. ~~water quality, limited to TSS, pH, turbidity, nitrogen and phosphorous.~~

73 In the event that a Suitably Qualified and Experienced Person considers a Representative Watercourse is not representative of general watercourse stream characteristics within the Project area, justification and an alternative Representative Watercourse must be provided to Council for certification. The Consent Holder shall survey such other Watercourse recommended by a Suitably Qualified and Experienced Person, and certified by Council, using the same process in condition ~~77~~ 76.

74 The Consent Holder shall provide to the Team Leader the results of the pre-construction freshwater monitoring within ~~60~~ 30 working days of the final pre-construction monitoring being undertaken. ~~, including the rationale for where an alternative stream has been surveyed under condition 73.~~

Freshwater ecology: Recording of streams watercourses affected by the Project

75 The Consent Holder shall instruct a Suitably Qualified and Experienced Person to identify and record all Watercourses and Wetlands that will be affected by Project Works, prior to the start of Project Works, including:

- a. Location;
- b. Length;
- c. Width;
- d. intermittent or permanent status; and
- e. which of the Representative Watercourses surveyed under condition 72 and 73 the Watercourse ~~or Wetland~~ is most similar to, with explanation and justification.

This information shall be provided to Council for certification.

Freshwater ecology: Replacement works for loss of watercourse stream ecological value and function

76 The Consent Holder shall mitigate and/or offset for streamworks or loss of watercourse stream ecological value and function in accordance with the requirements of the following technical reports prior to completion of Project Works:

- a. Stream Ecological Valuation: application to intermittent streams (Auckland Council Technical Report 2016/023); and

- b. Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report 2011/009).

77 The quantum of watercourse mitigation and/or offset and its design and location shall be set out in a Streamworks Ecological Compensation Plan Effects Management Plan (SECP SEEMP). The SECP SEEMP shall:

- a. Confirm the Watercourses ~~and Wetlands in condition 75~~ that ~~have been~~ will be directly affected by the Project;
- b. Outline the method to extrapolate the SEV calculations for the Representative Watercourses Streams to apply to all Watercourses ~~and Wetlands~~ affected by Project works;
- c. Calculate the quantum and location of mitigation and/or offset provided in accordance with SEV requirements as set out in condition 74 76; and
- d. Demonstrate that the proposed mitigation and/or offset is like for like in regard to watercourse hydrology and substrate;
- e. Integrate the mitigation and/or offset planting with the restoration planting and habitat rehabilitation required in the Ecological Management Plan required under Designation Condition 55 where practicable; and
- f. Provide site specific enhancement plans for the proposed mitigation and/or offset sites that:
 - i. Details how the anticipated outcomes used in the SEV calculations will be achieved;
 - ii. Assesses the risk of stream bank erosion and the likely successful establishment of proposed riparian planting;
 - iii. Details the planting to be carried out, including a list of species, numbers to be planted, their common and botanical names, method of planting, planting locations and densities;
 - iv. Details the timing of works and techniques of weed and plant management measures for a period of no less than 5 years or until canopy closure is achieved;
 - v. Details of monitoring methods and frequency, including at a minimum annual reporting to Council for a period of no less than 5 years or until canopy closure is achieved; and
 - vi. Is in accordance with AUP:OP Appendix 16: Guideline for native revegetation plantings.

The SEEMP must be provided to Council for certification prior to the start of any Construction Works.

Advice Note:

Reference to offsetting stream loss through rehabilitated wetland areas is not an approach consistent with the AUP:OP policy E3.3(4) and was not anticipated to form part of the offsetting requirements at the time of granting consent. Such an approach would need to clearly demonstrate adherence to the 'effects management hierarchy' and preferably a 'trade-up' offset outcome.

New Condition (77a) - Freshwater ecology: Recording of Wetlands affected by the Project

The Consent Holder shall engage a Suitably Qualified and Experienced Person to identify and record all Wetland that will be affected by Project Works, prior to the start of Project Works, including:

- a. Location of Wetlands affected by Project Works;
- b. Total area of Wetland and area impacted by the Project Works, delineated using best practice;
- c. Wetland type;
- d. Ecological value.

New Condition (77b) – Freshwater ecology: replacement works for loss of Wetland ecological value and function

The quantum of wetland mitigation and/or offset and its design and location shall be set out in a Wetland Ecological Effects Management Plan (WEEMP). The WEEMP must:

- a. Confirm the wetlands that will be directly affected by the Project Works;
- b. Calculate the quantum and location of offset to be provided using best practice transparent and quantified offset accounting methods, ensuring that:
 - i. The potential value of the impacted wetland is accounted for;
 - ii. The relative ecological gain at the proposed offset site is accounted for;
 - iii. An appropriate suite of ecological attributes are included in the offset accounting methods; and
 - iv. Time lag is accounted for.
- c. Demonstrate that the proposed offset is like for like in regard to wetland type and hydrology;
- d. Integrate the offset planting with the restoration planting and habitat rehabilitation required in the Ecological Management Plan required under Designation Condition 55 where practicable; and
- e. Provide site specific enhancement plans for the proposed offset sites that:
 - i. Details how the anticipated outcomes used in the offset calculations will be achieved.
 - ii. Details the planting to be carried out, including a list of species, numbers to be planted, their common and botanical names, method of planting, planting locations and densities;
 - iii. Details the timing of works and techniques of weed and plant management measures for a period of no less than 5 years or until canopy closure is achieved;
 - iv. Details the works and techniques animal pest control for a period of no less than 5 years or until canopy closure is achieved;
 - v. Details of monitoring methods and frequency, including at a minimum annual reporting to Council for a period of no less than 5 years or until canopy closure is achieved; and
 - vi. Is in accordance with AUP:OP Appendix 16: Guideline for native revegetation plantings.

The WEEMP shall be provided to Council for certification prior to the start of any Construction Works.

New Condition (77c) - Freshwater ecology: Mitigation and offset implementation

All mitigation and/or offset enhancement works are to be carried out in accordance with the certified SEEMP and WEEMP required by conditions 77 and 77b.

Prior to 30 June each year following the start of Project Works the Consent Holder shall submit to Council for certification an Annual Mitigation and Offset Plan (AMOP). The AMOP must:

- a. Detail the extent of Watercourse and Wetland that have been directly affected by the Project Works over the previous 12 months; and
- b. In general accordance with the certified SEEMP and WEEMP required by conditions 77 and 77b, detail the quantum of mitigation and offset works required to address the effects detailed in the AMOP

The Consent Holder shall undertake the works outlined in each AMOP within two (2) years of the AMOP being certified by Council.

Written confirmation shall be provided to Council within 30 days of the works outlined in each AMOP being completed confirming that all works have been completed in accordance SEEMP and WEEMP required by conditions 77 and 77b.

New Condition (77d) - Freshwater ecology: Protection of Watercourse and Wetland offset sites

Prior to the completion of Project Works the consent holder shall provide to Council for certification the details of the protection mechanisms, including any evidence that covenants have been registered on applicable record/s of title, that are to apply to all offset sites outlined in the SEEMP and WEEMP required by conditions 77 and 77b. The protection mechanisms shall ensure:

- a. native vegetation is protected in perpetuity;
- b. ongoing pest plant and pest animal control is undertaken; and
- c. stock is excluded from the sites in perpetuity

New Condition (77e) - Freshwater ecology: Maintenance of Watercourse and Wetland offset sites

Offset enhancement works outlined in the certified SEEMP and WEEMP required by conditions 77 and 77b shall be maintained in accordance with the SEEMP and WEEMP for a period of no less than 5 years or until canopy closure has been achieved, whichever is longer.

Prior to the completion of the maintenance period Council shall provide certification that:

- a. Canopy closure has been achieved;
- b. No more than 10% loss in plant numbers has occurred;

- c. Weed control has been carried out to a level where no mature fruiting or flowering weed species are present within the planting areas and no weed species that will impact on the growth rates of the planted trees and/or the potential for native regeneration are present within the planting area; and

All works have been undertaken in accordance with the certified SEEMP and WEEMP required by conditions 77 and 77b.

Native fish capture and release

- 78 ~~The Requiring Authority shall engage a Suitably Qualified and Experienced Person to conduct native fish habitat and presence surveys within the Designation prior to the start of Project Works in streams that may be impacted by Project Works. Prior to any wetland or streamworks activity commencing, the consent holder shall submit a Native Freshwater Fish Capture and Relocation Plan (NFFCRP), produced by a suitably qualified and experienced freshwater ecologist, to Council for certification. This plan must detail how native fish will be salvaged prior to works commencing and must include but not be limited to:~~
 - a. Methodologies and timing to capture fish, including kakahi and koura, within the impacted watercourse and wetland habitats, or justification there is no habitat for native fish present at the time of earthworks;
 - b. Fishing effort;
 - c. Details of the relocation site;
 - d. Fish exclusion fencing to prevent fish movement to the watercourse reach where works will occur;
 - e. Placement of appropriate fish screens on the inlets of any pumps used;
 - f. Methods to manage streamworks during September to November inclusive of any year, to minimise impacts on fish during the fish spawning season;
 - g. Storage and transport measures including prevention of predation and death during capture; and
 - h. Euthanasia methods for diseased or pest species.

- 79 ~~In the event that the surveys confirm native fish habitat and presence the Requiring Authority~~ ~~Authoring~~ ~~The Consent Holder shall;~~
 - a. Engage a Suitably Qualified and Experienced Person to confirm and implement the NFFCRP required by condition 78. best practice methods to:
 - i. manage streamworks during September to November inclusive of any year, to minimise impacts on fish during the fish spawning season; and
 - ii. capture and relocate native fish species prior to commencement of Project Works.
 - b. Provide a report on the surveys undertaken and the results to the Manager.

New Condition (79a) - Freshwater ecology: Limits to adverse effects

No more than 1.2 ha of high or very high value wetland, is to be reclaimed by the Project Works. No reclamation of Wetland sites WN_W Koura 02 or HN_W Hoteo_02 is to occur.

Advice note:

'High' and 'Very high' are used here in a manner consistent with their meaning as set out in Roper-Lindsay, J., Fuller S., Hooson, S., Sanders, M., Ussher, G. (2018). Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition

New Condition (79b) – Ensure machinery does not discharge/spill hazardous substances during earthworks

No machinery shall enter the wetted cross section of the bed of the Watercourse at any time. All machinery associated with the streamworks activity must be operated (including maintenance, lubrication and refuelling) in a way, which ensures no hazardous substances such as fuel, oil or similar contaminants are discharged.

In the event that any discharge occurs, works shall cease immediately, and the discharge must be mitigated and/or rectified to the satisfaction of Council.

Advice Note:

Refuelling, lubrication and maintenance activities associated with any machinery should be carried out away from any water body with appropriate methods in place so if any spillage does occur that it will be contained and does not enter the water body.

New Condition (79c) – No reclamation within spoil disposal sites

Aside from those streams and wetlands which will be affected by the proposed motorway embankment and other structures, no reclamation of any body of freshwater associated with any soil disposal sites is to occur.

Where watercourse diversions for soil disposal sites are required, the design certification for diversions required by condition 58 must demonstrate how reclamation of streams and wetlands is avoided.

Stormwater Discharge

80 The Consent Holder shall ensure that:

- a. The stormwater devices to be implemented are in accordance with the operational Water – Design Technical Report;
- b. All stormwater from the Project is captured, treated and discharged through offline Stormwater Management Wetlands to the extent practicable; and
- c. All stormwater management devices and controls are designed to:
 - i. Include adaptation for 100-years of climate change up to year 2130;
 - ii. Provide treatment in accordance with GD01;
 - iii. Remove gross litter and floatables such as oil and volatile hydrocarbons;

- iv. ~~Provide detention for the 95th percentile 24 hour rainfall event in accordance with GD01;~~
- v. Provide peak flow attenuation for rainfall events up to 2 year ARI in accordance with the performance criteria in Condition 99;
- vi. Provide for the conveyance of 100 year ARI event, including provision for overland flow up to and including this event; and
- vii. Minimise changes to the water flow into the Kourawhero Wetland Complex and to maintain the pre-construction water table level to the extent practicable if located upstream of the Kourawhero Wetland Complex.

81 The Consent Holder shall ensure that stormwater outfalls are designed to include erosion control to minimise the occurrence of bed scour and bank erosion at the point of discharge in accordance with TR2013/018 and GD01.

82 The Consent Holder shall ensure that cut off drains are designed to:

- a. Incorporate grassed or rock lining to prevent erosion;
- b. Must incorporate rock check dams for slope >5%;
- c. Provide for the 100-year ARI rainfall event for the upstream catchment and discharge to existing streams or new culverts or where not reasonably practicable discharge to the road edge conveyance system; and
- d. Minimise bed scour and bank erosion at the point of discharge.

83 The Consent Holder shall ensure that sediment traps (or similar alternative devices) are designed to minimise sediment eroded off rock cuts entered stormwater systems.

84 The Consent Holder shall design Stormwater Management Wetlands ~~to~~ that will be:

- a. Located offline from existing Watercourses;
- b. Located outside of the 100-year ARI floodplain if practicable;
- c. Capable of providing peak flow attenuation for 2-and-10 year ARI storm events to pre-development levels;
- d. Capable of providing detention for the 95th percentile 24-hour rainfall event in accordance with GD01;
- e. Show to include:
 - i. Forebays and submerged or baffled low flow outlets so that floatables and litter can be trapped at the main outlet;
 - ii. Planting in emergent, littoral, riparian zones except in some areas of deep zone that are to remain plant free; and
 - iii. Valves on low-level wetland outlets to enable valves to be closed in the event of a spill to contain spilt material in wetland.
- f. Shown to provide for climbing fish access to wetlands where appropriate, to be determined by a Suitably Qualified and Experienced Person.

New Condition (84a)

In the event that alternative stormwater management is proposed due to new technological advances, which will not result in the need, as determined by the Council, for an application pursuant to Section 127 of the RMA, the following information shall be provided:

- Plans and drawings outlining the details of the modifications; and
- Supporting information that details how the proposal does not affect the capacity or performance of the stormwater management system.

All information shall be submitted to, and approved by the Council, prior to implementation.

- 85 The Consent Holder shall use pre-treatment measures where higher sediment loads are anticipated, such as sediment traps for sediment eroded off rock cuts.
- 86 The Consent Holder shall ensure that the Project stormwater system is designed so that water can be collected from tunnels following tunnel washdown, accidental spill, or firefighting activities, and disposed of to a facility consented to receive contaminated water.
- 87 The Consent Holder shall ensure that stormwater management devices associated with local roads altered by the Project convey water runoff via vegetated and/or rock lined swales adjacent to the road prior to discharge to existing streams.

Advice Note:

The consent holder is advised that any stormwater management devices associated with local roads will be maintained by Auckland Transport and therefore it is advised that discussions are undertaken with Auckland Transport to agree a final design.

- 88 The Consent Holder shall maintain stormwater treatment devices to ensure that the criteria in Conditions 80 to 87 of this Consent are achieved.

New Condition (88a)

The consent holder shall develop a stormwater monitoring programme (SMP) to assess the adequacy of the wetlands for fish passage, including after an event of a spill and submit to Council for certification 20 working days prior to the commencement of the stormwater discharge. The SMP shall include and not be limited to:

- a) Sampling locations from the wetlands where fish passage is to be implemented;
- b) Methods and procedures for discharge sampling including after an event of a spill including wetlands upstream of the Watercare Treatment Plant;
- c) Monitoring parameters for analysis shall include:
 - Total Suspended Solids (TSS) mg/L
 - Copper (total) mg/L

- Zinc (total) mg/L
 - Total Petroleum Hydrocarbons (TPH) mg/L
 - Oil and grease
 - Temperature (where discharging to stream)
- d) Identified trigger levels for each of the above parameters. These trigger levels shall be developed with reference to the ANZECC Guidelines for water quality where applicable.
- e) The methods and procedures for investigating and reporting stormwater discharge monitoring results to Council

Within 5 working days of receipt of the sample results showing contaminants exceeding the agreed trigger levels specified in the certified monitoring programme required in condition 88:

- a) an investigation must be undertaken to determine why exceedances were detected and to identify any additional source controls or treatment required; and
- b) the results of the investigation must be provided to the Council.

Planting of stormwater management devices

- 89 The Consent Holder shall prepare planting plan(s) for all planted stormwater management devices (including treatment/conveyance swales). The planting plans shall be prepared by a Suitably Qualified and Experienced Person and shall include:
- a. Location, planting methodology and maintenance details;
 - b. Details of plant species, plant numbers, density and distribution; and
 - c. Details of proposed pest plant management.
 - d. Details of steps taken to integrate planting with other planting required for the Project where practicable.

Design certification – stormwater management devices

- 90 The Consent Holder shall submit the final detailed design of the stormwater management devices (ie excluding conveyance measures) to the Manager for certification at least 20 days prior to the start of construction of the proposed stormwater management devices. The final detailed design shall include:
- a. drawings;
 - b. specification design report(s); and
 - c. calculations and planting plans for the stormwater management devices.

- 91 ~~If a response has not been received from the Manager within 20 Days following the provision of the final detailed design, the design shall be deemed certified and construction can commence.~~

- 92 The Consent Holder shall carry out all permanent stormwater measures in general accordance with designs certified in Condition 90.
- 93 Stormwater management devices shall be fully operational prior to the discharge of water from any impervious area identified to discharge to each device.

As Built Plans – Stormwater management devices

- 94 The Consent Holder shall submit As-Built Plans for stormwater management devices to the Manager at least 20 Days prior to use of the relevant device for its intended operational purpose.
- 95 The As-Built Plans shall be certified by a Suitably Qualified and Experienced Person and shall include:
- a. The surveyed locations and elevations of all stormwater devices which shall be measured to the nearest 0.02 metre with co-ordinates expressed in terms of the New Zealand Transverse Mercator Projection and DOSLI datum;
 - b. Stormwater management device details including locations, dimensions, volumes, flood levels, sections, treatment efficiencies, inlet, discharge rates and outlet structures;
 - c. Photographs at all stormwater systems outfall locations; and
 - d. Documentation of any differences between the certified design plans under Condition 90 and the As-Built Plans submitted under Condition 94.

Stormwater Operation and Maintenance Plan

- 96 The Consent Holder shall prepare a Stormwater Operation and Maintenance Plan (SOMP) prior to operation of the state highway to ensure the Project stormwater management devices are maintained to achieve their design function.
- 97 The SOMP shall be prepared by a Suitably Qualified and Experienced Person and shall:
- a. Identify a procedure for monitoring and maintaining the Project stormwater management devices; and
 - b. Include the following:
 - i. Location map and access arrangements;
 - ii. Inspection and maintenance requirements and frequency;
 - iii. Routine and emergency contacts; and
 - iv. As-built drawings and stormwater system information.
- 98 In preparing the SOMP the Consent Holder shall consult with the owner of the commercial plantation forest (Mahurangi Forest) located west of SH1 with respect to permanent stormwater management activities which directly interface with forestry operations. If the Requiring Authority has not received any comment from the owner of the Mahurangi Forest within 20 Days of providing the SOMP to them, the Requiring Authority may consider the relevant party has no comments.

Flooding

- 99 The Consent Holder shall ensure that:

- a. the design of the Project does not result in an increase in the 100 year ARI flooding levels greater than 100mm vertically outside the Designation or create a flood risk to any habitable building, including within the Designation which is to be retained.
- b. The design of the project does not increase the frequency of flooding for rainfall events up to the 2 year ARI.

Compliance with this Condition shall be demonstrated by a hydraulic and hydrological model with the level of detail and reporting to be agreed with the Manager. The peak flood levels and flood flows for pre-development and post-development of the Project shall be compared upstream and downstream at the Designation boundary.

100 The Consent Holder shall demonstrate that any headwater ponding upstream of any Project culvert in the 100 year ARI event is contained within either:

- a. Land within the Designation at the time of construction; or
- b. An existing floodplain.

Air Quality

101 Discharges of dust, odour or fumes must not cause offensive or objectionable effects at any location beyond the boundary of the Site, in the opinion of a Council compliance officer when assessed in accordance with the Good Practice Guide for Assessing and Managing Dust (Ministry for the Environment, 2016). The Consent Holder shall ensure that dust management at the Site is undertaken in accordance with the CAQMP and minimises dust generation as far as practicable. The Consent Holder shall avoid, as far as practicable, objectionable or offensive odour, dust and fumes arising from the operation of a rock crusher, beyond the boundary of the Designation impacting on HSRs.

102 The Consent Holder shall prepare a Construction Air Quality Management Plan (CAQMP) to outline the measures to be adopted to meet condition 101. The CAQMP shall be prepared by a Suitably Qualified and Experienced Person and shall include as a minimum:

- a. A description of the works, and periods of time when emissions of odour, dust or fumes might arise from the Construction Works, including operation of the rock crusher;
- b. Identify the location(s) of any mobile rock crusher for the duration of construction
- c. Identification of HSRs that may be adversely affected by emissions of odour, dust or fumes from the ~~rock crusher(s)~~ Construction Works;
- d. Methods for mitigating dust that may arise from the Construction Works including watering for dust suppression, minimising open earthwork areas, limiting earthworks during high winds, mineral extraction and rock crushing, potentially including minimum setbacks from HSRs where necessary, emissions control equipment (e.g. enclosure and/or water sprays at transfer points), and monitoring of weather conditions and visual inspections;
- e. Measures to manage adverse dust effects generated by construction traffic on unsealed roads, which may include metalling of yards and access roads, controlling vehicle speeds, and sealing sections of road where construction traffic will be close to a dwelling;

- f. Methods for maintaining and operating construction equipment and vehicles to minimise visual emissions of smoke from exhausts;
- g. Methods for undertaking and reporting on the results of daily inspections of Construction Works that might give rise to odour, dust or fumes;
- h. Methods for monitoring and reporting on the state of air quality during Construction Works, including wind speed, wind direction, air temperature and rainfall;
- i. Methods to remediate ~~objectionable and/or offensive~~ adverse dust deposits from Construction Works on HSRs, potentially including cleaning exterior surfaces of houses or driveways and/or cleaning of water tanks and replenishment of water supplies.
- j. Procedures for maintaining contact with stakeholders and notifying of proposed construction activities, with reference to the SCMP, including complaints procedures;
- k. Construction operator training procedures; and
- l. Contact details of the site supervisor or Project manager and the Project Liaison Person (telephone number and email or other contact address).

103 The CAQMP shall be submitted to the Council for certification in accordance with the conditions titled “Management Plan Certification Process.” When preparing the CAQMP the Suitably Qualified and Experienced Person shall have regard to the guidance contained in the Good Practice Guide for Assessing and Managing Dust, Ministry for Environment, 2016 and the NZ Transport Agency Guide to assessing air quality impacts from state highway projects (version 2.3, October 2019), or any subsequent version.

Groundwater

New condition 104 (Updated Assessment of Drawdown)

At least twenty (20) working days prior to the commencement of dewatering, the Consent Holder shall provide an updated Hydrogeological Assessment based on the Detailed Design to confirm that the potential effects arising from drawdown remain within the envelope considered at the time of consenting and to confirm if monitoring of any specific areas is warranted.

New Condition 105 (Damage Avoidance)

All excavation, dewatering systems and works associated with the taking and diversion of groundwater shall be designed, constructed and maintained so as to avoid Damage to buildings, structures and Services, or impacts on lawful groundwater or surface water takes, outside that considered as part of the application process unless otherwise agreed in writing with the asset owner.

New Condition 106 (Bore survey)

At least 3 months prior to the commencement of activities authorised by this consent, the Consent Holder shall undertake a bore survey (including but not limited to location, depth, pump type and groundwater level (where accessible) of all properties within the calculated extent of drawdown as per the updated assessment required by Condition 104. The survey

shall determine if any bores in existence at the date this consent was granted, are likely to be materially affected by drawdown effects from the Project.

The bore assessment process shall be set out in the updated Hydrogeological Assessment required by Condition 104 and shall include recommendations as to any specific measures to avoid, mitigate or remedy effects beyond that considered at the time of consenting. This must include recommendations for any monitoring.

New Condition 107 (Settlement)

At least 3 months prior to the commencement of activities authorised by this consent, the Consent Holder shall undertake a risk assessment to identify buildings, structures and utilities in existence at the date this consent was granted, that are at-risk of damage due to settlement caused by the project works.

The risk assessment process must be set out in the updated Hydrogeological Assessment required by Condition 104 and must be based upon the final road alignment and construction methodology. The assessment must include recommendations for any specific measures to avoid, mitigate or remedy effects beyond that considered at the time of consenting. This must include recommendations for any pre-, during or post-construction conditions surveys or other monitoring.

New Condition 108 (Settlement Contingency Actions)

If the Consent Holder becomes aware of any Damage to buildings, structures or Services potentially caused wholly, or in part, by the exercise of this consent, the Consent Holder must:

- (a) Notify the Manager and the asset owner within two working days of the Consent Holder becoming aware of the Damage.
- (b) Provide a report prepared by a SQEP (engaged by the Consent Holder at their cost) that describes the Damage; identifies the cause of the Damage; identifies methods to remedy and/or mitigate the Damage that has been caused; identifies the potential for further Damage to occur, and, describes actions that will be taken to avoid further Damage
- (c) Provide a copy of the report prepared under (b) above, to the Manager and the asset owner within 10 working days of notification under (a) above.

Advice Note: *It is anticipated the Consent Holder will seek the permission of the damaged / affected asset owner to access the property and asset to enable the inspection/investigation. It is understood that if access is denied the report will be of limited*

extent.

New Condition 109 (Bore Interference Contingency Actions)

The consent holder must investigate, report on, and remedy as necessary/if appropriate interference effects caused by the exercise of this consent on a lawful water taker (at the time this consent determined).

- a) Within ten working days of a request to investigate and report on a claim of interference effects the Consent Holder must report to the Council and Claimant on their investigation of the claimed interference.

- b) The investigation must be by an appropriately qualified person and the report must clearly identify whether the exercise of this consent more likely than not is the cause of the reported interference effect, including identifying what the investigation included to determine the conclusion; what action is proposed to remedy the matter, if any; the proposed timeframe for remedying the matter, if remedial action is necessary.

- c) Should the Claimant's loss of the ability to lawfully abstract water be the result of interference effects caused by the exercise of this consent the Consent Holder shall reimburse the lawful water taker for the reasonable ordinary commercial costs of alternative water supply for that period the exercise of this consent prevented/prevents the lawful water taker from abstracting groundwater in accordance with the authority for their water take. And, the Claimant's reasonable ordinary commercial costs of demonstrating the Consent Holder be required to investigate and report on the alleged interference effect (see below Advice Note), all within ten working days of receiving receipt from the affected lawful water taker.

Condition 109 shall not apply where the Claimant and the Consent Holder have reached an alternative agreement such that the Claimant agrees to no longer having the benefit of Condition 109.

The obligations in Condition 109 which require the Consent Holder to take action which involves access to a third party's property (bore, information etc) and where the Consent Holder has made a reasonable attempt to obtain that access but access is denied or the third party has not responded to the Consent Holder's request/s within ten working days then, provided the Consent Holder has provided evidence of the denial or non-response to the satisfaction of Council, the Consent Holder does not need to take that action in order to comply with the conditions of this consent.

Advice Notes:

- i) The Council must advise the consent holder of any claim it receives of interference effects.
- ii) The Council will request the Consent Holder to investigate and report on a claim of interference effects if it is satisfied the claim should be investigated by the Consent Holder.
- iii) It is expected the Council will review any complete claim and decide whether to request action by the Consent Holder within three working days.
- iv) The claim needs:
 - a. To be by a lawful water taker (at the time this consent was determined).
 - b. Describe the alleged interference effect.
 - c. Include confirmation from a suitably qualified and experienced person/party that the Claimant's bore and pump are otherwise in good working order, and that lowering the pump (or pump intake) or deepening their bore is not a feasible option (refer AUP Policy E2.3(7)(f))
 - d. Confirm that reasonable access will be provided, to a suitably qualified and experienced hydrogeological professional engaged by the consent holder, to their bore and any pump, water take records and other relevant information for the purposes of investigating the bore interference claim.
- v) It is anticipated the Consent Holder will have sought, and incorporated as considered reasonable, the Claimant's input and agreement on remedial action/s, if such are necessary.
- vi) The potential costs specified in Condition 109 above does not extend to other costs such as but not limited to replacing a pump, replacing a pump with a different type of pump, re-casing a bore, deepening a bore, grouting or re-grouting a bore.

Advice Notes:

Soil Contamination

Consents have not been granted regarding potential human health effects from contaminated soils under the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 or contaminant discharges under Chapter E30 of the Auckland Unitary Plan (Operative in Part), or any subsequent provisions. Depending on the final location and extent of earthworks and risks of soil contamination present, further investigation and consents may be required.

Stormwater Management Devices

All stormwater management devices should be designed to achieve the maximum infiltration achievable, and at a minimum, based on a default ground infiltration rate of 2mm/hr as suggested in GD01 – unless device-specific geotechnical constraints and operation/safety limitations prevent retention through infiltration, in which case the required detention volume shall be increased by the retention volume.

ATTACHMENT 1 - METHODOLOGY FOR CALCULATION OF SEDIMENT REDUCTION FACTORS AND THE EFFECTIVENESS OF SEDIMENT REDUCTION ACTIVITIES



Subject	Marine Mitigation Calculation Process	Project Name	Warkworth to Wellsford
Attention	Justine Bennett	Project No.	IZ083000
From	Kate Clay, Lydia Cetin		
Date	May 2019		

1. Introduction

This note outlines a process to calculate the necessity and size of additional mitigation areas of land to be retired and planted to offset the quantum of sediment discharged during the project.

The quantum of sediment discharged from the Project during construction should be offset in one generation, which is nominally 25 years following the end of the Project, through land retirement and planting strategies. The types of land retirement and planting available for sediment mitigation are:

- Planting and stabilisation of riparian margins of streams;
- Retirement of pasture areas and planting with shrubs and trees;
- of plantation forest areas, which may remain as exotic forest or be replanted as native forest Retirement, and cease being harvested.

The Project already includes Landscape and Ecology (L&E) mitigation planting, which has the additional benefit of erosion reduction. If the L&E mitigation planting does not offset the full quantum of sediment discharged during construction, then additional sediment mitigation planting will be required.

2. Sediment Reduction Factors

The sediment offset of the indicative L&E planting has been estimated through modelling. This has enabled quantification of the average annual offset of different retirement and planting types within the Project Designation. These sediment reduction factors have been calculated for mitigation planting in different areas and are set out in Table 1.

Table 1 Estimated sediment reduction factors (average offset) associated with retirement and planting mitigation options over 25 years

Mitigation type	Options	Sediment reduction over 25 years
Planting and stabilisation of riparian margins of streams	Stream REC class 2-3	0.35 Tonnes/metre
	Stream REC 4+	*Not previously assessed
Retirement of pasture areas and planting with shrubs/trees	Flat slopes	1.11 Tonnes/hectare
	Flat to moderate slopes	1.85 Tonnes/hectare
	Moderate slopes	2.91 Tonnes/hectare
	Steep slopes	*Not previously assessed
Retirement of plantation forest	Retire after harvest in 2020	1.82 Tonnes/hectare
	Retire before harvest in 2020	3.64 Tonnes/hectare

Note: *the current proposed mitigation planting does not include these categories, should future planting be proposed for these typologies an appropriate Sediment Reduction factor will need to be derived.

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It should be noted that the modelled indicative L&E mitigation planting, which is based on the indicative alignment and associated level of design, is subject to change as the Project progresses. Only areas within the proposed designation were modelled, therefore retirement and planting of steep areas of pasture and planting of higher order streams has not been modelled to date. The forest reduction factors are based on literature not modelling, so there is potential that retiring steeper areas of forestry could increase the sediment offset. Additionally, the modelling focussed on those catchments discharging to the Kaipara Harbour where the greatest sediment yields were predicted, and the Mahurangi was not modelled.

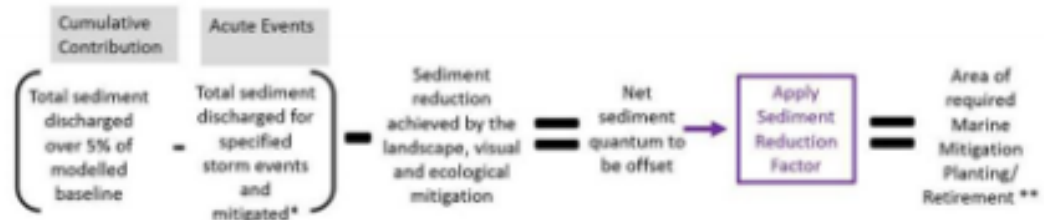
Therefore, these sediment reduction factors will need to be confirmed following detailed design as the quantum and location of the proposed landscape and ecological mitigation may change through that process.

3. Outline of Sediment Quantum Calculation Process

The steps and inputs to calculate the areas and types of planting and retirement necessary to mitigate the quantum of sediment discharged during construction are as follows:

1. Identify the quantum of sediment to be mitigated from the construction site in tonnes (to be provided by on site monitoring). This will include the sediment generated through large storm events and cumulative total of small rain fall events;
2. Calculate the quantum of sediment to be offset through the final Ecology and Landscape mitigation planting in a nominal 25-year timespan, as estimated with a modelling exercise;
3. Minus the L&E mitigation quantum (step 2) from the total sediment offset quantum (step 1), to calculate the net quantum of sediment to be offset through additional mitigation (e.g. land retirement and planting).
4. Based on the sediment reduction factor, calculate the area/length required of additional sediment mitigation planting.

Figure 1 below represents the process schematically:



* Greater than 10 year ARI derived load in the Hotoe Catchment
 * Greater than 30 year ARI derived load in the Mahurangi Catchment
 ** To enable benefits to accrue within 25 Years (nominal)

Figure 1 Process to estimate area required for additional marine mitigation planting