Beachlands South Fast-track

Auckland Council Specialist Memo

Annexure C:

Coastal Water Quality and Marine Ecological Effects

Dr. Kala Sivaguru

07 October 2026

1.0 APPLICATION DESCRIPTION

Application and property details

Fast-Track project name:	Beachlands South
Fast-Track application number:	EPA reference: FTAA-2606-1256 Council reference: BUN60467962

2.0 Technical Specialist Memo – Marine Ecology, Coastal water quality, sediment quality, Underwater noise effects on the coastal marine environment

To:	Brooke Dales – Lead Planner Adonica Giborees – Principal Project Lead
From:	Dr. Kala Sivaguru, Senior Coastal Specialist
CC	Alan Moore, Principal Specialist
Qualifications & Relevant Experience:	My name is Kalayarasi (Kala) Sivaguru. I hold an 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 Auckland Council where I have worked since March 2013. 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. In this role I undertook long-term research and monitoring programmes for marine reserves across Auckland Region. I am a member of New Zealand Marine Sciences Society and New Zealand Coastal Society. In my current role I have been involved in assessing the effects of many resource consent proposals, in particular on marine ecological values. These include various structures, including bridges, wharves, jetties, marine farms, mangrove removal, dredging and sand extraction, and discharges. This has included the assessment of effects, including underwater noise effects of

	impact and vibratory pile driving in the CMA. I have attended and presented expert evidence at Council, EPA and Environment Court hearings.
Preparation in Accordance with the Code of Conduct:	I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses (**Code**), and have complied with it in the preparation of this memorandum. I also agree to follow the Code when participating in any subsequent processes, such as expert conferencing, directed by the Panel. I confirm that the opinions I have expressed are within my area of expertise and are my own, except where I have stated that I am relying on the work or evidence of others, which I have specified.
Signature:	
Date:	07 October 2026

3.0 Executive Summary/Principal Issues

This technical memo assesses the water and sediment quality, marine ecological effects, and underwater noise effects associated with the proposed sheet piling required to construct a cofferdam for the proposed works within the Coastal Marine Area (CMA). The proposed CMA works include the discharge of up to 1,383 m³/day of treated wastewater via an offshore outfall located approximately 2 km offshore during Stage 2 of the development. In addition, residual effects management measures, including ecological compensation and offsetting, are proposed in relation to sediment discharges to intertidal shellbank habitats at Waikopua Shellbanks during the approximately 10-year construction phase of the wider Stage 1 urban development.

The marine ecological values described in the Marine Ecological Assessment (Attachment 13B) indicate that benthic macroinvertebrate communities within the subtidal habitat, which forms the immediate receiving environment for the proposed treated wastewater discharge, exhibit levels of abundance, richness, and diversity consistent with healthy soft-sediment habitats, including areas of seagrass. In contrast, the benthic ecological health of the surrounding intertidal habitats within the CMA is characterised by low species diversity and has been identified as degraded under the Auckland Unitary Plan Degradation Classification.

Available water quality monitoring results provided by the applicant indicate that background concentrations of total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) are generally close to guideline concentrations at the proposed discharge location. The Water Quality Outfall Modelling Assessment predicts a mixing zone of approximately 100 m for the Stage 2 discharge volume of 1,383 m³/day, with an estimated dilution of approximately 850-fold at the edge of the mixing zone. This mixing zone forms the basis for the assessment of potential effects on water quality, sediment quality, and marine ecology. Accordingly, the assessment of environmental effects has been undertaken on the basis of the maximum proposed discharge volume of 1,383 m³/day.

The applicant proposes monitoring of water quality, sediment quality, benthic ecology, and changes in the extent of seagrass habitat in the vicinity of the offshore outfall. This monitoring programme would assist in validating the model predictions and confirming whether actual environmental effects are consistent with those predicted by the assessment.

Residual effects management measures are proposed to address contaminant and sediment discharges arising from Stage 1 construction activities associated with the wider urban development. These measures include shellbanks enhancement works at Waikopua Shellbanks, comprising mangrove removal and ongoing management across an area of up to 15 hectares. However, alternative compensation sites identified in the Ecological Report for implementation should the shellbank enhancement not achieve the intended outcomes are considered outside the scope of the current application, as no information has been provided to assess their ecological values, suitability, or effectiveness.

The wider development is proposed to occur over an approximately 10-year construction period. Therefore, should consent be granted for the proposed shellbank enhancement and mangrove removal activities, these measures should be implemented during the development and construction phases when potential adverse effects on the CMA are occurring, rather than being deferred until Stage 2 when the offshore outfall works are proposed. Implementing these measures during the construction period would better align with the proposed adaptive management framework and provide a greater opportunity to achieve the intended ecological outcomes and offset or mitigate adverse effects as they arise.

Overall, I support the proposed construction of the offshore outfall and the discharge of treated wastewater to the CMA via the offshore outfall, subject to the implementation of the recommended consent conditions, including the proposed Marine Monitoring Plan (MMP). This support is contingent upon the proposed wastewater treatment system being fully implemented prior to, or as part of, Stage 2 of the development, and that the discharge volume does not exceed the assessed maximum of 1,383 m^3/day.

In addition, I support the proposed shellbanks enhancement and mangrove removal works at Waikopua Shellbanks, as outlined in the Ecological Report and the draft Coastal and Biodiversity Management Plan (CBMP), subject to the provision of the outstanding information identified in this memo and the implementation of the recommended consent conditions.

4.0 Documents Reviewed

The following documents have been reviewed in preparing this memorandum:

- Attachment 0B-Planning Assessment
- Attachment 0B2-s67 response table
- Attachment 10 -Wastewater Report
- 10A -Wastewater Ocen Outfall method
- Attachment 13 and 13A-Water Quality Outfall Modelling Study
- Attachment 13B-Marine Ecological Impact Assessment
- Attachment 13D-Marine EcIA Volume 2 Appendices (Appendix F)
- Attachment 13E-Marine Compensation Areas and Habitats
- Attachment 18 and 18A-Noise Assessment

5.0 Additional Reasons for Consent Not included in AEE / Incorrect Reasons for Consent

- F2,19.8 (A84)- This rule is not required. The rules in Table F2.19.10 cover occupation of the common marine and coastal area (CMCA) and use of the coastal marine area (CMA). See Note 1 under header “Table F2.19.10 Activity table - Structures

- The Planning assessment (Attachment 0B) has included rule F2.19.2 (A12) for disposal of organic material for the shellbank enhancement works. Whilst the source of organic material for disposal is not clarified, description in the Marine Ecology Report (Attachment 13B) indicates deposition rather than disposal. Accordingly, the appropriate rule for the shellbank enhancement would be a consent trigger for deposition. Based on the description provided in the Marine ecology report, shell bank enhancement proposed is within SEA-M1 (43w1). Accordingly, the correct rule for deposition of shell material for the shellbank enhancement would be Rule F2.9.2(A9). The activity status would be a Non-Complying.

6.0 Specialist Assessment

6.1. Proposed works in the Costal Marine Area (CMA)

Wastewater outfall and discharge

The application proposes to discharge of 1383m^3/day of treated wastewater via a outfall and diffuser into the coastal marine area (CMA) during stage 2. The actual outfall pipe would have a capacity of up to 4,000m^3/day.

The proposed coastal outfall would comprise:

• Approximately 1.0 km of onshore pipeline;

• Approximately 2 km of offshore pipeline depending on final alignment selection; and

• A treated effluent diffuser at the outfall terminus

The outfall in the CMA is to be constructed using horizontal directional drilling (HDD).

The seaward end of the outfall and diffuser includes construction of a cofferdam.

Stormwater

Stormwater outfalls and ongoing stormwater discharges from the completed development are proposed. However, detailed information regarding the stormwater outfalls, including their design and associated structures within the CMA, has not been provided.

Compensation/offsetting works

The proposal includes compensation measures to address residual adverse effects associated with the wider urban development identified during the Plan Change 88 process, in particular sediment discharges.

The compensation measures include ecological enhancement works at the Waikopua Shellbanks, including shellbank enhancement by the placement of new shell material and mangrove and pest plant removal.

6.2 Ecological values of the coastal marine area relevant to the proposal

The subject CMA site comprises three distinct tidal creeks (Waikopua, Turanga and Maungamaungaroa Creeks). This area encompasses by eight Significant Ecological Areas - Marine (SEA-M1 & SEA-M2) that are identified in the AUP (Appendix F of the Marine Ecological Impact Assessment, Attachment 13B). The outfall would be directionally drilled within SEA M2 ,43a. The proposed discharge location, including the proposed coffer dam has no SEA-M overlay. However, the discharge has the potential to have effects on the values of the adjacent SEA-M2 (Turanga Creek Estuary, 43a).

The ecological values attributed to this overlay in the AUP being:

"Three distinct tidal creeks (Maungamaungaroa, Turanga, and Waikopua) flowing into one large bay, within which a complex of intertidal mud, sand, and shell flats have accumulated. This physical variety provides a similarly varied range of habitats for an assortment of animal and plant communities. The intertidal banks are a very rich feeding ground and important mid tide roost for many hundreds of a variety of international migratory and New Zealand endemic wading birds including a number of threatened species. Turanga Creek is the largest estuarine habitat, including mangrove shrubland ecosystems, in the Hunua Ecological District. The Department of Conservation has selected this area as an Area of Significant Conservation Value (ASCV)".

Attachment 13B of the application - Marine Ecological Impact Assessment provides marine ecological values of the subtidal marine habitats.

Benthic ecology is the habitat that would potentially be affected by the proposed discharge and construction of offshore outfall. Accordingly, the summary of that habitat information is repeated here.

Marine ecological values provided in the Marine Ecological Assessment show that the benthic macroinvertebrate communities within the subtidal habitat comprise abundance, richness and diversity consistent with healthy soft-sediment habitats.

I agree with the benthic ecological values provided by the applicant for the *subtidal habitat*. However, I note the benthic ecological health of intertidal habitats is characterised by low species diversity and appears to be already degraded. This is reflected in the Auckland Unitary Plan (AUP) degradation classification discussed in Section 6.5 below.

Subtidal seagrass (*Zostera muelleri subsp. novazelandica*)

Approximately 78.1 ha of intertidal and subtidal seagrass beds are present in Waikopua estuary. Seagrass cover within the intertidal zone is not continuous but is present in patches across the mid low intertidal areas, as observed during site survey and from aerial imagery.

I note that seagrass/eelgrass, is categorized as “at risk” in the NZ Threat Classification System. Policy 11 of the New Zealand Coastal Policy Statement requires that adverse effects on seagrass beds should be avoided.

Marine mammals

The Marine ecology report (Attachment 13B) identifies the potential marine mammal species that frequent the zone of influence of the discharge using DOC marine mammal sightings database. Those marine mammal species relevant to the proposal mainly include:

- Resident populations, such as Bryde’s whales and common dolphins, are present in the Hauraki Gulf year-round
- Bottlenose dolphin and orca
- Fur seals, as the most common pinniped in the Hauraki Gulf marine Park, utilise the waters, islands and rocky coastlines for resting, breeding, nursing and foraging

6.3 Sediment quality

Metals and Polycyclic Aromatic Hydrocarbons (PAH)

The applicant’s information indicates that there were no exceedances above the ERC green or DGV / GV-High guideline values for arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.

Nutrients

Total nitrogen (TN) was reasonably consistent across all sites (600 - 700 mg/kg) and fall within the ‘good’ ecological quality status. Total organic carbon (TOC) ranged between 0.47 % to 0.61 % with most sites classified as ‘good-very good.

There is no guideline thresholds for total recoverable phosphorus (TRP). TRP concentrations ranged between 280 to 340 mg/kg. TRP concentrations were lower when compared with another study of central Auckland estuaries basins and beaches which had results between 383 - 767 mg/kg (Simha, 2025). This suggests that the TRP concentrations are comparatively low, and do not indicate enrichment.

Benthic Health and sediment quality

Benthic Health Model (BHM)

The applicant has used BHM to interpret the ecological condition of the application area.

I note that the Benthic Health Model (BHM) developed by the Auckland Council to provide a tool for classifying intertidal sites within the region to monitor the ecosystem health to report on state of the environment. The Benthic Health Model (BHM) is used to address changes in benthic community structure associated with gradients in mud and heavy metal contaminants.

Separate models have been created for two of the key environmental contaminants in Auckland area estuaries: sediment mud content (percent silt+clay, CAPmud) and sediment heavy metal concentrations (copper, lead and zinc; CAPmetals). The Trait based Index (TBI) is a functional traits-based index developed for use in Auckland Council's State of the Environment reporting. This index is based upon the richness of macrofaunal taxa in seven individual functional trait groups (Hewitt, et al, 2012).

TBI ranges from 0 (most healthy site) to 1 (most degraded site) as below (Table 1.6).:

Health group	CAP Metals		CAP Mud		TBI		Combined Health Score
	Cut-off	Value	Cut-off	Value	Cut-off	Value	
1 - Extremely good	-0.164	0.2	-0.12	0.2	0.4	0.33	≤ 0.2 "extremely good"
2 - Good	-0.067	0.4	-0.05	0.4	0.3	0.67	0.2 - 0.4 inclusive "good"
3 - Moderate	0.023	0.6	0.02	0.6		1.0	0.4 - 0.6 exclusive "moderate"
4 - Poor	0.100	0.8	0.10	0.8			0.6 – 0.8 exclusive "poor"
5 - Unhealthy		1.0		1.0			≥ 0.8 "unhealthy with low resilience"

Accordingly, I consider using the BHM tool for the subtidal offshore outfall location to have limitations due to change in benthic community composition and temporal and spatial extent of mud and contaminant concentrations. I note that the applicant's Marine Ecological assessment acknowledges those limitations in using the BHM tool. However, the report states that Mud BHM scores ranged from 4.33 to 5.26, indicating consistently high to very high relative impacts of sedimentation across all sites. Four sites (D, E20, E50, and N40) were classified as very high for mud, while the remaining five sites were classified as high. Metal BHM scores ranged from 3.61 to 5.02, showing slightly more variation.

I agree with the sediment quality assessment presented in the Marine Ecology Report (Attachment 13B), including the information relating to metals, polycyclic aromatic hydrocarbons (PAHs), nutrients, and sediment particle size.

6.4 Water quality

The applicant's Marine ecology report (Attachment 13B) has provided the following for water quality analysis:

The measurements from Foley et al. (2018) at the mouth of the Turanga Estuary (refer to Figure 4.9) from 2009 to 2015 were used to estimate background concentrations of water quality constituents within the Whitford Embayment (Table 4.5). The results indicate that background concentrations of TN, TP and TSS are close to guideline concentrations within the proposed discharge location.

Attachment 13 and 13A-Water Quality Outfall Modelling Study provides the following for water quality

The measurements of Total Nitrogen (TN), Total phosphorous (TP), and Total Suspended sediment (TSS) from Foley et al. (2018) at the mouth of the Turanga Estuary (1774464 m E, 5914091 m N, NZTM) from 2009 to 2015 enable us to estimate a background concentration of water quality constituents within the Whitford Embayment. The 80th percentile background concentrations of TN ~= 0.1 mg/L, TP ~= 0.03 mg/L and TSS ~= 15 mg/L are estimated; The guideline values from Foley et al. (2018) are based on the 80th percentile of background measurements from the Auckland region.

A summary table of the guidance, background and discharge concentrations is included in Table 2.5 of Water Quality Outfall Modelling Study.

While I acknowledge the use of available water quality data from the Council's technical publication, the reported 80th percentile values indicate that contaminant concentrations in 20% of the samples exceeded the stated concentrations. Consequently, the data may not fully capture the upper range of contaminant concentrations that may occur within the receiving environment.

6.5 AUP Degradation classification

The Auckland Council report 2013/009 titled" Identification of Degraded Marine Receiving Environments" identifies "degraded areas" on the basis of three measures of ecosystem health water quality, sediment contamination, and benthic health, using data from region wide monitoring programmes.

Overall, the Turanga Creek has been classified as 'Degraded 1' by Auckland Council (Carbines et al. 2013; Working report 2013/009, and Figure B7.4.2.1: Areas of coastal water that have been degraded by human activities in Chapter B7-Natural Resources of the AUP).

Individual measures were:

- Water quality (Degraded 1, with 'Poor' Water quality index);
- Sediment quality (red) (Environmental Response Criteria (ERC) Red conditions reflect conditions where significant degradation has probably already occurred); and
- Benthic health
  - Degraded 1, rank 4 (unhealthy)).

6.6 Effects on water and sediment quality on the CMA receiving environment

Hydrodynamic modelling

Attachment 13 and 13A-Water Quality Outfall Modelling Study provides information on hydrodynamic modelling undertaken for the wastewater discharge. The relevant points are below:

- Measured data from the Auckland region was used to set the guideline value if the measured values exceeded the ANZECC 80th percentile thresholds (Foley et al. 2018).

- The 4,000 m³/day that was modelled is the maximum flow rate for the outfall pipe. **This volume is more than three times the discharge proposed under the current consent application. Accordingly, it provides a very conservative basis for assessment against relevant guideline concentrations.**
- The modelling predicts that at edge of the 100 m mixing zone, the minimum 50th percentile dilution factor is 1100-fold and for the 80th percentile conditions, the dilution factor is 850-fold (Figure 6.3 of the report).
- The analyses indicate that changes in the concentrations of the assessed water quality constituents at the edge of the mixing zone, resulting from the treated effluent discharge, are well below applicable guideline values. These predicted changes are also substantially lower than existing background concentrations, which remain the primary determinant of overall water quality in the receiving environment.

I note the following in relation to the modelling:

While the applicant has relied on the findings of Foley et al. (2018) to establish guideline values for the receiving environment, the use of 80th percentile ambient water quality values as modelling input parameters introduces additional uncertainty into the assessment. An 80th percentile value indicates that 80% of samples are at or below that concentration, while 20% exceed it. Consequently, the modelling is not based on the actual effluent quality proposed for discharge.

The applicant also states that modelling a discharge volume of 4,000 m³/day rather than the proposed Stage 2 discharge volume of 1,383 m³/day is conservative, and that the resulting predicted mixing zone of approximately 100 m should likewise be regarded as conservative. While I agree that the use of a larger discharge volume provides a conservative assessment, I note that the rationale for adopting 4,000 m³/day relates to the ultimate design capacity of the pipeline of the outfall and potential future stages of development rather than the volume currently proposed.

For the purposes of the current application, I consider the predicted 100 m mixing zone to be an appropriate basis for the effects assessment. This is because compliance with relevant contaminant guideline values is expected to be achieved beyond the mixing zone, consistent with the New Zealand Coastal Policy Statement (NZCPS) definition of a mixing zone:

Mixing zone is defined in the NZCPA as below:

“The area within which ‘reasonable mixing’ of contaminants from discharges occurs in receiving waters and within which the relevant water quality standards do not apply”.

<u>Effects</u>

Accordingly, the extent of the mixing zone forms the basis for managing and assessing the effects of the discharge on the receiving environment during stage 2.

However, I recommend a consent condition limiting the maximum discharge volume to the proposed volume of 1383m^3/day under the current application. Any future increase in discharge volume beyond the consented amount should be subject to further assessment and additional resource consents, as required.

Summary

Based on the maximum discharge volume of 1,383 m³/day proposed for Stage 2 and the predicted dilution of approximately 850-fold at the edge of the estimated mixing zone, any adverse effects on water and sediment quality within the wider coastal marine area are expected to be less than minor.

However, measurable changes in water and sediment quality are still anticipated within the immediate receiving environment, particularly within approximately 100 m of the diffuser before full mixing occurs. Given the uncertainties associated with the modelling assumptions and the importance of validating predicted outcomes, monitoring of key water and sediment quality parameters within the receiving environment is recommended. Such monitoring would provide confirmation of the model predictions and enable any unforeseen effects to be identified and managed appropriately.

6.7 Effects on marine ecology from the proposal

While I generally agree with the magnitude of effects conclusion in Attachment 13B-Marine Ecological Impact Assessment, I note the following:

Potential effects from the treated wastewater discharge

Contaminant loads and target effluent quality

The Wastewater Report (Appendix 10) provides estimated contaminant loads in Section 5.3.2 and details of treatment performance and target effluent quality in Section 11.3. The report states that the treatment standard will be maintained at the same level as Stage 1, with the primary difference being the discharge pathway, namely discharge via a marine outfall rather than land disposal.

The above sections set out the predicted effluent quality and contaminant loads entering the CMA receiving environment based on the proposed discharge volume of 1,383 m³/day. As contaminant loads are expected to increase proportionally with increases in discharge volume, it is considered appropriate that, should consent be granted, the authorised discharge volume be limited to a maximum of 1,383 m³/day. A condition is recommended to ensure compliance with this limit.

Seagrass habitats

The applicant has relied primarily on aerial imagery to estimate the extent of seagrass habitat within the offshore outfall area. While the Ecological Report identifies approximately 78.1 ha of

seagrass habitat, it does not distinguish between intertidal and subtidal seagrass beds, with the latter being most relevant to the proposed discharge location.

In addition, seagrass extent is known to vary seasonally, and some features identified from aerial imagery may represent macroalgal assemblages rather than seagrass. Accordingly, the mapped extent of both intertidal and subtidal seagrass habitat identified in the Ecological Report may change over time.

Given the predicted increases in total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) loads associated with the proposed discharge, there is potential for changes in the spatial extent, density, and condition of seagrass beds over time. In particular, elevated TSS concentrations may reduce light penetration through the water column, which can adversely affect seagrass productivity, growth, and long-term health.

However, I note that the applicant proposes to monitor potential effects on the spatial extent of subtidal and intertidal seagrass within the Whitford Embayment that may be attributable to nutrient enrichment from the discharge. This monitoring is outlined in Section 5.5.1 of the proposed Marine Monitoring Plan (MMP).

As seagrass beds has been identified as at risk in the New Zealand Threat Classification list, I strongly recommend monitoring the changes in the extent of seagrass beds within the mixing zone (100m from the outfall) and outside the mixing zone of discharge location.

Effects on Benthic infauna (Benthic health)

Whilst the proposed offshore outfall discharge location is located outside the SEA-M overlays identified in the AUP, a number of SEA-M1 and SEA-M2 areas are present within the wider receiving environment. In addition, many of the ecological values attributed to the SEA-M overlays, particularly those associated with intertidal habitats, relate to benthic communities that provide feeding grounds for avifauna and values related to mangrove ecosystems. These benthic habitats are also the ecological receptors most likely to be directly affected by the proposed discharge.

Policy B7.2.2(5) of the AUP requires adverse effects on SEA-M1 and SEA-M2 areas to be avoided. The applicant's assessment of effects is based on a predicted 100 m mixing zone derived from the discharge modelling. To verify the predicted magnitude of effects associated with key contaminants, including nutrients, metals and total suspended solids (TSS), I support the proposed benthic ecology monitoring programme under the Marine Monitoring Programme (MMP). However, to ensure that the monitoring provides ecologically meaningful results, appropriate indicator species should be selected from the baseline benthic macroinvertebrate communities, and suitable sampling locations and monitoring frequencies should be established to enable the detection of any adverse changes attributable to the discharge.

Effects on fish and avifauna

It is considered that the proposed treated effluent quality is not likely to cause any detrimental effects on mobile species such as fish and avifauna and/or any effects through food chains and trophic level interactions.

Cumulative effects of the proposed discharge

It is acknowledged that quantifying cumulative effects from the proposed discharges to the CMA receiving environments is challenging. Models are useful and allow us to predict outcomes, but they are predictions only. Given that the Applicant's estimated discharge volume during stage 2 is 1383m^3/day and compared to the catchment's total discharge, the resulting cumulative effects are unlikely to be readily distinguishable from natural variability.

It is noted that there is other two wastewater discharge applications within the wider receiving environment, namely Watercare's wastewater treatment plant discharge application, which is currently being processed, and the Whitford Manor wastewater treatment plant discharge application, which is currently under appeal.

Should consents be granted, the discharge from all these three applications could cumulatively affect the ecology of the wider Turanga estuary.

However, the proposed Monitoring and Management Plan (MMP) would provide a mechanism to validate the predictions made in the assessment and to identify any unforeseen adverse effects arising from the discharge, including cumulative effects.

Summary of ecological effects on the environment

In summary, based on the ecological values provided for the immediate receiving environment, the subtidal habitats are characterised by generally healthy soft-sediment communities, with benthic ecological values considered relatively high. This is supported by the spatial extent and distribution of seagrass habitats identified within both the immediate and surrounding receiving environment. However, the AUP degradation classification identifies the intertidal habitats within Turanga Creek as being of low ecological diversity and already degraded.

However, the AUP degradation classification identifies the intertidal habitats within Turanga Creek as being of low ecological diversity and already degraded. As noted in Section 6.5 above, Policy B7.2.2(5) of the AUP seeks to avoid adverse effects on areas identified in the Schedule 4 Significant Ecological Areas – Marine (SEA-M) Schedule. While the proposed treated wastewater discharge is unlikely to result in significant adverse effects on the existing ecological values of the receiving environment, including those associated with the SEA-M overlays, it is considered appropriate to require a level of ecological monitoring to ensure that no further degradation occurs as a result of the discharge entering Turanga Creek. Accordingly, I support the ecological monitoring programme outlined in the MMP Ecological Report (Attachment 13b), which will provide a mechanism to verify the predicted effects and confirm that the ecological values of the receiving environment are maintained over time.

6.8 Effects from the Construction of offshore outfall

Beachlands South Wastewater Ocean Outfall HDD Methodology (Attachment 10A), Marine Ecology report (Attachment 13B) and the response to questions raised related to construction in the s67 memo provide the following:

- The preferred alignment and construction methodology have been developed on the basis of the preliminary geological interpretation and are considered technically feasible for the anticipated ground conditions. The alignment will be refined during subsequent design stages following completion of additional marine geotechnical investigations and detailed HDD design.
- The offshore HDD of 450mm diameter outfall pipeline spread shall be established on a jack-up barge positioned at the offshore exit location in approximately 4.5 m water depth. The coffer dams and dewatered area are expected to be in the order of 150 m^2.
- The details relating to the cofferdam dimensions and layout is not available and will be provided in detailed design phase. The area provided in the methodology document is indicative only.
- Currently it is estimated that the diffuser setup will be approximately 10m long, could occupy a space of about 2m wide, and the diffuser may be about 0.5m above the seabed.
- Detail relating to the number, diameter, spacing, and orientation of diffuser ports is not available at this stage and will be provided in the detailed design phase.

Construction effects of offshore outfall

Based on the indicative outfall alignment plan, a portion of the proposed pipeline would be located within an SEA-M2 area identified in the AUP. However, this section of the pipeline is proposed to be installed using Horizontal Directional Drilling (HDD). No direct disturbance of the foreshore or seabed or the associated ecological values within the SEA-M2 area is anticipated. Accordingly, any adverse effects on the ecological values of the SEA-M2 by the HDD installed outfall are expected to be negligible. However, where the pipeline emerges from the seabed and the offshore outfall and diffuser are installed, there would be some construction-related effects on the seabed.

The Ocean Outfall Methodology report identifies two potential construction options. The preferred option involves the use of a cofferdam for installation of the above seabed outfall and diffuser. While the duration of construction has not been specified in the information provided, the works are likely to occur over several months. Construction activities, including cofferdam installation and removal, excavation works, and retrieval of the tunnelling machine, would result in temporary disturbance of the seabed.

In addition, retrieval of tunnelling machine and cofferdam removal would also cause disturbance to the seafloor. These works are likely to cause an increase in suspended sediment which could affect the benthic fauna. But this is likely to be short term, confined to the construction period, and such disturbance would be remedied by natural processes within a short time.

The proposed construction methodology includes measures to minimise sediment disturbance, including the implementation of erosion and sediment control measures and the use of a cofferdam to contain construction effects. These mitigation measures are expected to substantially reduce adverse effects associated with the construction phase.

Construction of stormwater outfalls

I note that while the Planning Report (Attachment 0B) identifies the relevant infrastructure rules relating to stormwater outfalls within the CMA in Section 7.2 (F2.19.10, Rule A133), no further information has been provided regarding the number, design, or construction methodology of the proposed stormwater outfalls. Notwithstanding this information gap, any adverse effects arising from the construction of the stormwater outfalls are anticipated to be temporary, localised, and confined to the immediate works area. Given the small scale and typical nature of such works, construction-related effects on the coastal environment are expected to be less than minor.

To provide for the construction of the stormwater outfalls, the conditions are included for the construction, occupation of the Common marine and coastal area (CMCA,) and use of the CMA associated with these structures.

To ensure construction effects are appropriately managed, I support the draft consent condition requiring the preparation and implementation of a Construction Management Plan (CMP) prior to commencement of works. The CMP would provide detailed information on the final design, dimensions, construction methodology, and environmental management measures for the offshore outfall and stormwater outfalls in the CMA. It would also enable review of the final alignment of the pipeline and offshore outfall. I note that any significant departure from the indicative alignment assessed as part of this application may result in additional environmental effects and could require further assessment and resource consent approvals.

Given the ecological value of seagrass habitats, it is recommended that appropriate measures be implemented during construction of the outfall and diffuser to avoid, remedy, or mitigate adverse effects on these habitats as much as reasonably practical. This approach is consistent with the intent of Policy 11 of the NZCPS, which requires protection of indigenous biological diversity and habitats supporting threatened species within the coastal environment.

6.9 Underwater noise effects from impact and vibratory sheet piling

The Applicant has sought a consent (under F2.19.8, Rule A114 of the AUP) to undertake impact driving and vibratory piling (sheet piling) for the proposed cofferdam construction works within the CMA.

F2.23.1 (1) and F2.23.1 (3) (c)-Matters of discretion are relevant to this application in relation to underwater noise effects.

F2.23.1 (c)-Matters of discretion

Underwater blasting, impact and vibratory piling, marine seismic surveys

(i) the health and well-being of marine fauna (including threatened and at-risk species) and people from the underwater noise associated with the proposal;

(ii) the practicability of being able to control the underwater noise effects;

(iii) the social and economic benefits of the proposal; and

(iv) the extent to which non-transitory or more than minor adverse effects on threatened or at risk indigenous species (including Maui's Dolphin and Bryde's Whale) are avoided.

Attachment 18, Assessment of Noise and Vibration Effects report has provided the following in relation to sheet piling for the proposed cofferdam construction:

- *The outfall would be located approximately 2km offshore in water that is approximately 5m deep (low tide). A coffer dam, nominally 20m x 10m would be constructed using an estimated 100 sheet piles, each in the order of 10 – 15m long. Initially, sheet piles would be vibrated through the mud seafloor before being bedded into the underlying stiffer materials with a percussion rig. Due to the small size on the coffer dam, it is anticipated that this process would take less than one week. The design team estimates that there will be up to 200 hammer strikes per day from the piling rig using a sacrificial timber dolly to both protect the pile and reduce noise.*
- On completion, the sheet piles would be pulled out with a crane, which would likely require a vibrating head to loosen them. The removal could be completed within one week.

Attachement 18 has provided the table below to indicate the base noise level and minimum distance from sheet piling to meet thresholds for the proposed sheet piling:

Table 10. Base Noise Data for Sheet Piling

	Noise Level at 1m, dB	
	Percussive Piling	**Vibro Piling**
SEL_{cum}	208	203
L_{peak}	214	189

Table 11. Minimum Distance from Piling to Meet the Thresholds

Species Group	LF Cetaceans	HF Cetaceans	VHF Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} threshold (m)	320	200	610	270	200
L_{peak} threshold (m)	NA	NA	200	NA	NA

NA – L_{peak} noise level is less than the threshold for the species group

The report states that mitigation and management measures would be required where marine mammals or penguins are observed within the specified separation distances during construction activities. To address potential effects associated with underwater noise, the report recommends a range of mitigation and management procedures, which are incorporated into the draft Construction Noise and Vibration Management Plan (CNVMP).

I note the following in relation to the above assessment:

Impact driving or vibratory piling in the water will generate underwater noise. The proposed sheet piling work involves both impact pile driving and vibratory piling.

Underwater noise has the potential to affect marine fauna including marine mammals, birds, fish species and benthic invertebrates. However, there are currently no established guidelines in New Zealand for these taxa groups.

Guideline for marine mammals

There is no New Zealand guidance on underwater noise effects in relation to any marine fauna including marine mammals and fish species. However, the scientific agency of National Oceanic & Atmospheric Administration (NOAA, 2024) (as updated by Southall et al (2019)) has produced guidelines that identify threshold levels above which individual marine mammals are predicted to experience changes in hearing sensitivity. Those changes are either temporary (Temporary Threshold Shift (TTS)), or permanent (Permanent Threshold Shift (PTS) for acute (<24hours)).

Based on the predicted noise levels in the above table, the underwater noise levels exceed the threshold levels predicted, mainly for TTS (as in the table below) to experience changes in hearing sensitivity.

Table 1: Summary of NOAA 2024 Guidelines auditory injury thresholds.

NOAA species group	Species included	Impulsive criteria (impact piling)	Non-impulsive criteria (vibro piling)
Permanent threshold shift (PTS)			
High-frequency (HF) cetaceans	Orca, common dolphin, dusky dolphin, bottlenose dolphin	193 $SEL_{cum\ (HF)}$ 230 dB L_{peak}	201 dB $SEL_{cum\ (HF)}$
Phocid Pinnipeds (PW)	Leopard seals	183 $SEL_{cum\ (PW)}$ 223 dB L_{peak}	195 dB $SEL_{cum\ (PW)}$
Otariid Pinnipeds (OW)	Sea lions and fur seal	185 $SEL_{cum\ (OW)}$ 230 dB L_{peak}	199 dB $SEL_{cum\ (OW)}$
Low frequency cetaceans (LF)	Bryde's whales	183 $SEL_{cum\ (OW)}$ 222 dB L_{peak}	197 dB $SEL_{cum\ (OW)}$
Temporary threshold shift (TTS)			
High-frequency (HF) cetaceans	Orca, common dolphin, dusky dolphin, bottlenose dolphin	178 $SEL_{cum\ (HF)}$ 224 dB L_{peak}	181 dB $SEL_{cum\ (HF)}$
Phocid Pinnipeds (PW)	Leopard seals	168 $SEL_{cum\ (PW)}$ 217 dB L_{peak}	175 dB $SEL_{cum\ (PW)}$
Otariid Pinnipeds (OW)	Sea lions and fur seal	170 $SEL_{cum\ (OW)}$ 224 dB L_{peak}	179 dB $SEL_{cum\ (OW)}$
Low frequency cetaceans (LF)	Bryde's whales	168 $SEL_{cum\ (OW)}$ 216 dB L_{peak}	177 dB $SEL_{cum\ (OW)}$

Accordingly, there is potential for marine mammal species identified as species of interest in Section 6.2 to be affected by underwater noise generated during construction, should they be present within the piling threshold distances identified in the applicant's underwater noise assessment.

To minimise underwater noise effects and avoid or mitigate adverse effects on marine mammals, appropriate consent conditions have been recommended in the condition section.

While the proposed impact and vibratory piling activities will generate underwater noise, the implementation of the proposed piling methodology, together with the mitigation and management measures included in the applicant's draft conditions, it is reasonable to conclude that adverse effects on potential marine mammals arising from the proposed impact and vibratory piling activities will be less than minor.

6.10 Residual effects management

Marine Ecological assessment outlines the approach to proposed residual effects management in section 6 of the Report. The Report states that there are no residual effects associated with the installation and operation of the ocean outfall and treated wastewater discharge. The residual effects management approach, as set out in the Private Plan Change 88, seeks to achieve

No Net Loss (NNL) outcomes for marine biodiversity through the type and magnitude of restoration and enhancement actions proposed. Accordingly, this section sets out:

• *An overview of residual effects management, i.e. offsetting and compensation (Section 6.1).*

• *The overall approach for addressing the residual effects on marine ecological values that cannot be avoided, remedied or mitigated (Section 6.2).*

• *The proposed habitat restoration or enhancement measures that will be undertaken for the purpose of addressing residual effects on marine ecological values (Section 6.3).*

Further the report add that the requirement for a Coastal Bird Management Plan (CBMP) was developed through the Beachlands South Precinct (BSP) process and was ultimately included in the Precinct Provisions.

Particular measures put forward are summarised below and outlined in more detail in the indicative draft CBMP in Appendix G:

- *Enhancement of the Waikopua Shellbanks, which are located within the Coastal Marine Area (CMA) to the south and west of the Project area. The Waikopua Shellbanks comprise two discrete shellbank features formed on either side of the estuarine creek and stream that drain from the Project area. The northern shellbank covers approximately 1 ha, while the southern shellbank covers approximately 0.6 ha, giving a combined enhancement area of approximately 1.6 ha.*
- *The degradation of shellbanks is primarily associated with encroachment by invasive weeds, including pampas, and mangroves which limits the availability of open shellbank habitat for roosting and nesting birds. Selective vegetation removal (mangroves and saline vegetation) and replanting of ground cover native species that introduce better line of sight, alongside pest mammal management, will improve the quality of this habitat type both for roosting and nesting purposes.*
- *Mangrove management. Selective removal of mangroves and ongoing maintenance of seedlings is proposed to maintain quality foraging habitat at the mouth of the Waikopua Creek. Without intervention it is likely that mangroves will continue to expand seawards in this location, compromising foraging habitat quality and impinging on other habitats.*
- *An area of approximately 5 ha is proposed for mangrove removal, as shown in Figure 4.1 of the CBMP (Appendix G). Subsequent to initial removal, a wider area of approximately* ***15 ha*** *is proposed for ongoing management and seedling control to maintain high-quality intertidal foraging habitat for coastal avifauna, as well as to provide for the protection of firm muddy sand / cockle shell covered flats from mangrove encroachment.*

An adaptive management approach is further outlined in the CBMP, noting here that in the event that compensation actions do not provide positive effects to coastal biodiversity values that outweigh adverse effects, ***there are other locations within the Whitford Embayment that could be considered for compensation actions, including:***

- *Roost enhancement of shellbanks close to Motukaraka Island or at Porterfield Road Esplanade Reserve.*

- *Restoration of the Waikopua Islands. A 2016 Ecological Restoration Plan for the islands outlines a number of potential compensation actions that could be implemented (Boffa Miskell, 2016).*

In conclusion, this report considers that all residual effects associated with the FTAA application can be adequately addressed through implementation of compensation measures outlined in the CBMP and associated Biodiversity Compensation Modelling. Associated monitoring to verify that expected ecological outcomes have been realised and to guide adaptive management, will further ensure positive effects (that outweigh adverse effects) for marine ecological values.

While I acknowledge the adaptive management approach anticipated by the Plan Change 88 process and the associated precinct provisions, I do not agree that deferring the provision of missing key information to the CBMP is appropriate. The information currently available is insufficient to enable a robust assessment of whether the proposed adaptive management measures are capable of achieving the intended environmental outcomes. In my view, the key components of the adaptive management framework should be provided as part of the application to allow the effectiveness of the proposed approach to be properly evaluated at the consent application stage.

<u>Effects from mangrove removal and shellbank enhancement</u>

The Ecological report states that :

When considering the ecological value of mangroves at this location, consideration is given to their regional IUCN threat status of Least Concern and the fact that they are locally and nationally common. At this location, the low stature mangroves are unlikely to provide the broader suite of ecosystem services that would be expected from old-growth, established mangrove habitats, although it is likely that they provide some foraging habitat for banded rail (Gallirallus philippensis), with a threat classification of 'At Risk – Declining' (Robertson et al., 2021). In the area proposed for mangrove removal, mangroves are also encroaching on other high value habitats. When balancing the ecological function of mangroves against the potentially detrimental impact to other high value habitats, mangroves are considered to be of moderate ecological value.

Areas of mangrove removal have been carefully considered to both achieve positive outcomes for coastal birds and shellbank habitat and to avoid the removal of older, higher stature mangroves that support higher species richness and biomass than recently established, low-stature mangrove stands (Morrisey et al., 2010). On this basis, mangrove removal proposed includes more recent mangrove encroachment i.e. back to a baseline circa early 2000s.

Studies on the effects of mangrove removal have identified that the type of mangrove removal (i.e. seaward strip, large scale contiguous, patchwork, seedling removal) has different levels of

ecological effect (de Satge, 2021). The proposed mangrove removal type would be considered small contiguous, given it is a small area on the seaward edge of extensive mangrove habitat in the Waikopua Creek. The de Satge study does not reference any specific case studies of small contiguous mangrove removal; however we expect the effect to be similar to that identified in seaward strip removal, which is considered to have a lower level of ecological effect as mangrove vegetation is still retained nearby (de Satge, 2021).

In the long term, it is considered that there will be an improvement in both the quality and availability of intertidal foraging habitat and the enhancement of a high-quality roost and nesting site. These positive effects are considered alongside the potential adverse effect on banded rail, noting:

• Extensive mangrove habitat availability in the Waikopua Creek; and

• Enhancement of the coastal compensation wetland behind the Waikopua Shellbanks will provide improved habitat and therefore a positive effect for banded rail.

While the mechanisms to achieve positive effects to the Waikopua Shellbanks may themselves have impacts to marine ecological values, overall effects can be managed to be very low for mangrove habitat, with a net gain effect for coastal avifauna and shellbank habitats.

While I generally accept the anticipated positive effects for coastal avifauna arising from the compensation and biodiversity offsetting measures outlined above, I note the following matters.

The proposed residual effects management measures appear to be linked to the agreed marine biodiversity outcomes established through the Private Plan Change 88 process. In support of this, the applicant has appended the report Estimates of Construction-Phase and Mature-Phase Contaminant Loads (NIWA, December 2021) to Attachment 13A, Water Quality Outfall Modelling Study.

My understanding is that the proposed shellbank enhancement areas and mangrove removal locations have been identified to offset or compensate for the potential effects associated with sediment discharges during the estimated 10-year construction phase of the development.

A draft Coastal Biodiversity Management Plan (CBMP) has been provided as Appendix G. However, this document has not yet been finalised. Accordingly, it is recommended that a condition be imposed requiring the finalisation and implementation of the CBMP.

I also note that the proposed residual effects management framework adopts an adaptive management approach and identifies additional locations, including shellbanks near Motukaraka Island, the Porterfield Road Esplanade Reserve, and the Waikopua Islands, as potential future management sites. As the ecological assessment does not provide any information or assessment of ecological values, scale of works, potential effects, or management outcomes for these locations, they are considered to be outside the scope of the current application and have therefore not been assessed in this review.

In relation to the proposed mangrove removal as part of the shellbank enhancement programme, the applicant's assessment does not consider the positive climate change-related functions of mangroves such as providing buffer from erosion.

In addition, any coastal permits issued for the proposed shellbank enhancement and mangrove management measures could only be granted for a period of 35 years. There is no guarantee that replacement consents would be granted in the future. But I also note, that if the compensation works were associated with sediment discharges during development, the discharges would cease once the development was completed.

Further, the proposed construction period for the wider development is approximately 10 years. Therefore, should consent be granted for the proposed shellbank enhancement and mangrove removal, these activities should be implemented during the development and construction phases, when potential effects on the CMA are occurring, rather than being deferred until Stage 2, when the CMA works proposed in this application are to be undertaken. Implementing these measures during the construction period would better align with the intended adaptive management approach and provide a greater opportunity to achieve the anticipated ecological outcomes and offset or mitigate construction-related effects as they arise.

7.0 Section 67 Information Gap

I have identified that there are no significant information gaps requiring a request under s67. However, I consider that the following detailed information should be provided through the recommended conditions:

- Detailed information on the proposed stormwater outfalls, including the number, design, location, and footprint of any associated energy dissipation and/or riprap structures within the CMA.

Detailed information relating to the Waikopua Island shellbank enhancement works, including the proposed total area of mangrove removal, volume of shell deposition, methodology for deposition, timing, extent of works, and monitoring requirements.

8.0 Recommendation

Treated wastewater discharge via offshore outfall

I support the proposed construction of offshore outfall and treated wastewater discharge to the CMA via the offshore outfall, subject to the implementation of the recommended consent conditions including implementing the proposed Marine Monitoring Plan (MMP). This support is contingent on the proposed wastewater treatment system being fully implemented prior to, or

as part of, Stage 2 of the development, and the discharge volume shall not exceed the assessed maximum of 1,383 m³/day.

Residual effects management (Compensation and offsetting)

I support the proposal outlined in the Ecological Report and the draft Coastal and Biodiversity Management Plan (CBMP), subject to the following:

- The shellbank enhancement and mangrove removal being undertaken at the Waikopua Shellbanks, as proposed. The area of mangrove removal should include the removal of low-stature mangroves within the Waikopua shellbank area, to the extent that is reasonably practicable.
- The shellbank enhancement and mangrove removal works being implemented as soon as practicable following the granting of consent, rather than being deferred to a later stage of the development.
- The implementation of all recommended consent conditions.

I do not support the implementation of residual effects management measures at the alternative locations identified in the Ecological Report. No information has been provided regarding the ecological values of these sites, the nature and extent of the proposed activities, the potential adverse effects arising from those activities, or the likelihood of achieving the anticipated ecological outcomes. As a result, I am unable to adequately assess the environmental effects associated with the proposed residual effects management measures at these alternative locations or determine whether they would be appropriate.

9.0 Proposed Conditions

I recommend that, should consent be granted for the proposed coastal discharge (DIS60471469), the construction, occupation and use of the Common Marine and Coastal Area (CMCA) for the offshore wastewater outfall and stormwater outfalls (CST60468041), and the shellbank enhancement and mangrove removal activities (CSTXXXXXX), the consent be subject to the following conditions.

(Additions are shown in red, and deletions are shown with strikethrough formatting)

Conditions Review

Shellbank enhancement including mangrove removal in the CMA at Waikopua Shellbanks

(Mangrove removal)

Condition 88:

~~Vegetation~~ Mangrove removal within the CMA must be undertaken outside the main native bird

breeding season (September to January inclusive) except where a suitably qualified ecologist has confirmed to the Consent Holder in writing that vegetation is clear of any native nesting birds, eggs, or chicks.

Additional Conditions

88A: One month prior to commencing mangrove removal associated with the shellbank enhancement activities, the consent holder must provide detailed information including but not limited to the total area of mangrove removal and ongoing management proposed over the duration of consent, Identification of all access points to the CMA, and the intended location of stockpiles of cleared vegetation on the adjacent reserve/site.

88B: All mangrove removal activities shall be undertaken using hand-held tools.

88C: All mangroves removed under this consent must be disposed of outside the coastal marine area (CMA) at the completion of work.

88D: The consent holder must cut all mangroves as close to the seabed level as possible to avoid leaving stumps that could create safety hazard post mangrove removal in the area.

Shellbank enhancement

88E: The consent holder must not deposit any organic material within the coastal marine area CMA at Waikopua Shellbanks other than shell material associated with shellbank enhancement activities. All shell material for shellbank enhancement sourced from an authorised supplier.

88F: The consent holder must provide the total volume of shell material deposited in the coastal marine area for shellbanks enhancement. The CBMP must include methodogy to monitor the extent of shell material deposited in the CMA.

Condition 89-No change

Marine Monitoring Plan (MMP)

Condition 91 & 92:

One month prior to discharging the treated wastewater under this consent, the consent holder must submit a finalised Marine Monitoring Plan (MMP) to Council for certification. The objective of the MMP is to provide detailed methodologies/techniques and process for the monitoring to obtain comparable data over the duration of consent, sampling sites should be close enough to detect any changes from the proposed discharge and to isolate other catchment contributions, sampling sites should be close enough to detect any changes from the proposed discharge and to isolate other catchment contributions, reporting and review of the environmental effects of the discharge authorised by this coastal permit. The MMP must specify the frequency of monitoring and parameters to be monitored, sampling locations and methodologies for baseline and routine monitoring.

(a) Baseline and routine monitoring must include monitoring of appropriate indicators of benthic ecology, sediment and water quality in the vicinity of the offshore wastewater outfall.

(b) Monitoring of change in the spatial and temporal extent of subtidal and intertidal seagrass in the Whitford embayment that can be attributed to effects from nutrient enrichment.

Occupation of the CMCA, and use of the structures in the CMA

Conditions 279:

This consent authorises the construction of an offshore outfall associated with wastewater discharge, construction of a cofferdam related to construction of offshore outfall, and stormwater outfalls, occupation of the coastal marine area with the structures, and use of the Coastal Marine Area (CMA) as part of the Project referenced in Condition [1] and Appendix 1 of the conditions, including the relevant engineering plans and Wastewater Concept Report prepared by GWE, include the following:

- A treated wastewater discharge pipe extending 2km into the CMA below the seabed;
- A treated wastewater discharge outlet structure extending from below the seabed to above the seabed;
- The construction of a temporary piled cofferdam to enable the construction of the outlet structure; and
- To discharge a maximum of treated wastewater of 1383m^3/day via the offshore outfall
- To discharge stormwater via outfall structures in the CMA.

Marine Construction Management Plan (MCMP)

Condition 281-287-No change recommended

Condition 288- ~~Marine Mammal Management Plan~~. It should read as Underwater noise from sheet piling

Condition 288 :

The Consent Holder must develop an Underwater Noise Management Plan (UWNMP), which must include monitoring and mitigation measures employed during sheet impact and/ or vibratory piling works for the construction and removal of a cofferdam in the CMA to manage underwater noise effects on the coastal marine area~~. on these marine mammal species~~. Mitigation measures to be included in the UWNMP must include the following:

Condition 289: No change recommended

Exclusive and Non-Exclusive Occupation of the common marine and coastal area

~~Condition 290:Exclusive occupation applies to that part of the CMA where the outlet structure rises from below the seabed to above the seabed and a small safety area around this structure. The exact area of exclusive occupation shall be defined on a plan and submitted to Council for certification once these works are completed.~~

~~Condition 291:Occupation, being non-exclusive occupation, of the CMA applies to the area where the treated wastewater pipe is located below the seabed. The exact area of non-exclusive~~

~~occupation shall be defined on a plan and submitted to Council for certification once these works are completed.~~

~~Condition 292: The Consent Holder may, for safety and security reasons, temporarily restrict public access to parts of the non-exclusive occupation area for maintenance, repair or monitoring purposes~~.

Exclusive and Non exclusive Occupation-offshore outfall and stormwater outfalls

Condition 290-292

The occupation of the common marine and coastal area by the authorised structures is not an exclusive right of occupancy. The general public or any person(s) must not be excluded from the area(s) or any part of the area(s) to which this consent applies, unless necessary for the primary purpose of the structure(s), and only to the extent to enable the primary purpose of the structures; and public access can only be excluded for safety, security, and maintenance reasons

Condition 293A (Post construction)

The consent holder must, reinstate the site within one week following the completion of works authorised under this consent in the CMA, remove all machinery, cofferdam and materials from the coastal marine area.

Duration

The duration to occupy the CMA with offshore outfall and stormwater outfalls, and use the structures must expire on 31 December 2061 (35 years) unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

Condition 297A (Shellbank enhancement and mangrove removal)

The duration of consent for the shellbank enhancement, mangrove removal, and ongoing mangrove seedling removal within the mangrove removal area (up to 15 hectares) must expire on 31 December 2061, unless the consent has lapsed, been surrendered, or been cancelled at an earlier date in accordance with the Resource Management Act 1991.

Condition 312

~~The volume of treated wastewater discharged via the coastal outfall discharge pipe must not exceed 4,000,000 litres per day.~~

The volume of treated wastewater discharged via the coastal outfall discharge pipe must not exceed 1383m^3 per day.

I note that the Marine Ecological Assessment (Attachment 13B) and the Water Quality Outfall Modelling Report (Assessment 13) assessed the contaminants loading associated with a treated wastewater discharge volume of 1,383 m^3/day, rather than the maximum capacity of the outfall (4000m^3/day).

Condition 314

This consent will expire on 31 January 2041 unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

It is not clear that the above duration of consent relates to treated wastewater discharge to the CMA. If it is, the duration sought for the discharge during stage 2 appears to be 15 years.