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Assessment of Ecological Effects: 43a Vipond Road and 20 Melia Place, Whangaparāoa

May 2021

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DOCUMENT APPROVAL

Document title:	Assessment of Ecological Effects: 43a Vipond Road and 20 Melia Place, Whangaparāoa
Prepared for:	Melia Development Limited
Version:	1
Date:	12 May 2021
Document name:	63493 Melia Place Assessment of Effects (01).docx

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REVISION HISTORY

Rev. No.	Date	Description	Author(s)	Reviewer
1	12/05/2021	Version 1	L.E Drummond	M. Delaney

Reference: Bioresearches (2021). Assessment of Ecological Effects: 43a Vipond Road and 20 Melia Place, Whangaparāoa. Report for Melia Development Limited.

Cover Illustration: View of the lawn bowls green and amenity planting vegetation on site.

CONTENTS

1 INTRODUCTION

Bioresearches were engaged by Melia Development Limited to undertake an Assessment of Ecological Effects of a proposed development at 43a Vipond Road and 20 Melia Place, Whangaparāoa, Auckland ('the Site') (Figure 1). An unnamed tributary of an unnamed stream is indicated to be present within the site. The proposed development will involve the construction of 59 residential dwellings with no stream works proposed.

This report describes the existing ecological values of terrestrial and freshwater areas, assess the potential effects of the proposed development on those values, and provides recommendations to avoid, minimise or mitigate adverse effects where appropriate.

Figure 1. Map of the site (yellow polygon) showing the predicted overland flow paths (blue lines), stormwater services (green lines) and Biodiversity: Current Extent (orange hatching) through the site. Base image sourced from Auckland Council Geomaps GIS viewer.

2 METHODOLOGY

A site assessment was undertaken by an experienced ecologist on the 22nd April, 2021 to assess the ecological values within the site. Prior to the field survey, a map of the site was created from Auckland Council Geomaps GIS viewer (GIS viewer), which defined the overland flow paths of any predicted watercourses, contours of the property and any ecological overlays. Assessments of the stream habitats, vegetation and potential faunal habitats were noted and photographed during the site visit. A desktop analysis of relevant databases was also undertaken.

2.1 Terrestrial Ecology

A site walkover was undertaken to assess the vegetation and terrestrial fauna values within the property. Botanic values recorded included native and exotic vascular vegetation and notes were made on the quality and extent of vegetation present on site. Fauna habitats assessed considered indigenous lizards and birds and an opportunistic bird survey took note of birds seen or heard within the duration of the visit.

2.2 Freshwater Ecology

Watercourses were classified under the Auckland Unitary Plan – Operative in Part (AUP OP) to determine, in accordance with the definitions in these plans, the ephemeral, intermittent or permanent status of these watercourses. During the site assessment, the presence and extent of water was noted and reference photos were taken and freshwater habitats were marked using a handheld GPS unit. The quality and extent of aquatic habitat was assessed, noting ecological aspects such as channel modification, hydrological heterogeneity, riparian vegetation extent, substrate type and any fish or macroinvertebrate habitat observed.

Under the AUP OP, an **intermittent stream** is defined as:

'Stream reaches that cease to flow for periods of the year because the bed is periodically above the water table. This category is defined by those stream reaches that do not meet the definition of permanent river or stream and meet at least three of the following criteria:

a) It has natural pools;
b) It has a well-defined channel, such that the bed and banks can be distinguished;
c) It contains surface water more than 48 hours after a rain event which results in stream flow;
d) Rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel;
e) Organic debris resulting from flood can be seen on the floodplain; or
f) There is evidence of substrate sorting process, including scour and deposition.'

2.3 Ecological Impact Assessment Methodology

Guidelines for undertaking Ecological Impact Assessments have been published by the Environmental Institute of Australia and New Zealand (EIANZ; Roper-Lindsay *et al*., 2018). Chapter 5 of the Guidelines provides criteria for assigning value to habitat for assessment purposes. Ecological values have been assigned based on Table 1, adapted from Tables 5 and 6 of EIANZ 2018. Criteria for describing the magnitude of effects are given in Chapter 6 of the EIANZ Guidelines (Table 2.)

The level of effect can then be determined through combining the value of the ecological feature/attribute with the score or rating for magnitude of effect to create a criterion for describing level of effects (Table 3). The cell in italics in Table 3 represent 'significant' effect under the EIANZ 2018 guidelines. Cells with low or very low levels of effects requires careful assessment and analysis of the individual case. For moderate levels of effects or above, measures need to be introduced to avoid through design, or appropriate mitigation needs to be addressed (Roper-Lindsay *et al., 2018).*

Table 1. Criteria for assigning value to habitat/species for assessment.

Value	Determining Factors
Very High	Nationally Threatened species found in the 'zone of influence' (ZOI) either permanently or seasonally. Area rates 'High' for at least three of the assessment matters of Representativeness, Rarity/distinctiveness, Diversity and Pattern, and Ecological Context. Likely to be nationally important and recognised as such.
High	Species listed as At Risk – Declining found in the ZOI either permanently or seasonally. Area rates 'High' for two of the assessment matters, and 'Moderate' and 'Low' for the remainder OR area rates 'High' for one of the assessment matters and 'Moderate' for the remainder. Likely to be regionally significant and recognised as such.
Moderate	Species listed as At Risk – Relict, Naturally Uncommon, Recovering found in the ZOI either permanently or seasonally. Locally uncommon or distinctive species. Area rates 'High' for one of the assessment matters, 'Moderate' or 'Low' for the remainder OR area rates as 'Moderate' for at least two of the assessment matters and 'Low' or 'Very Low' for the remainder. Likely to be important at the level of the Ecological District.
Low	Nationally and locally common indigenous species. Area rates 'Low' or 'Very Low' for majority of assessment matters, and 'Moderate' for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Exotic species including pests, species having recreational value. Area rates 'Very Low' for three assessment matters and 'Moderate', 'Low' or 'Very Low' for the remainder.

Table 2. Criteria for describing the magnitude of effects (EIANZ 2018)

Magnitude	Description
Very High	Total loss of, or a very major alteration to, key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature.
High	Major loss of major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature.
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature.
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances and patterns; AND/OR Having minor effect on the known population or range of the element/feature.
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature.

Table 3. Criteria for describing the level of effects (EIANZ 2018). Where text is italicised it indicates 'significant effects' where mitigation is required.

Magnitude of Effect	Ecological Value				
	Very High	High	Moderate	Low	Negligible
Very High	*Very High*	*Very High*	*High*	*Moderate*	Low
High	*Very High*	*Very High*	*Moderate*	Low	Very Low
Moderate	*High*	*High*	*Moderate*	Low	Very Low
Low	*Moderate*	Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low	Very Low
Positive	Net Gain	Net Gain	Net Gain	Net Gain	Net Gain

3 EXISITNG ENVIORNMENT

Figure 2. Ground-truthed watercourses present at 43a Vipond Road and 20 Melia Place, Stanmore Bay, Auckland.

3.1 Background and Ecosystem Classification

Historically (pre-human), the site would have been comprised of the ecosystem type 'Kauri, podocarp, broadleaved forest' which would have supported a diverse range of native flora and fauna (WF11, Singers *et al*., 2017). Prior to 1940, a large portion of the site was cleared of vegetation, with rows of shelter belts established and small sections of vegetation retained (Figure 3). A depression within the ground indicates the presence of a natural stream system and no changes in vegetation (i.e. changes in dark to light) which would be indicative of shifts from terrestrial to wetland habitats is present. Currently, the site consists of a Royal New Zealand Returned and Services Association (RSA) centre and a lawn bowls centre with carparking areas. The site is zoned Residential – Single House Zone under the AUP OP and is not subject to a Significant Ecological Area (SEA) overlay.

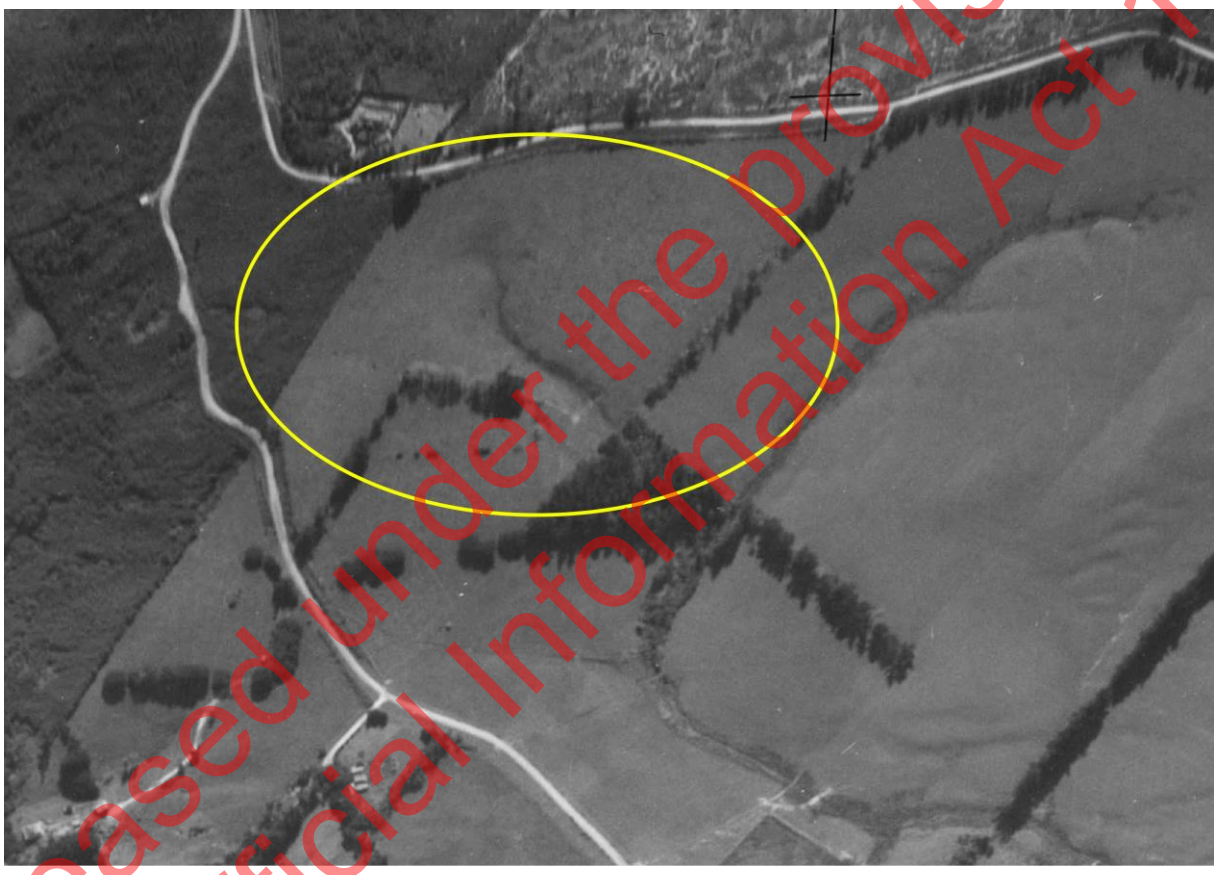

Figure 3. Historic aerial image from 1940 showing the approximate location of the site (yellow circle). Image sourced from Retrolens.

3.2 Terrestrial Ecology

3.2.1 Vegetation

Currently, the site supports approximately 2,500m^2 of the recognised ecosystem 'Kānuka scrub/forest' (VS2), under the AUP OP: Biodiversity current extent, over the south-eastern boundary of the site (Figure 1). The site currently consists of a mix of native and exotic vegetation with amenity planting established around the parking area and mown lawn on the western side of the site. Large areas of the site contain impermeable surfaces, consisting of: concrete parking areas and driveways, an RSA building and a lawn bowls green. Shelter belts of mixed exotic and native vegetation were established along the western boundary and the southern boundary consisted of dense vegetation. The site

predominantly contained mown grass with queen's palm (*Syagrus romanzoffiana*) amenity planting established down the driveway of 20 Melia Place.

Within the 20m riparian margin of the identified stream, the vegetation was heavily infested with wild ginger (*Hedychium gardnerianum*), elephant ear (*Alocasia macrorrhiza*), and climbing asparagus (*Asparagus scandens*) (Photo 1). Native vegetation within the riparian yard included kawakawa (*Piper excelsum*), cabbage tree (*Cordyline australis*), and tōtara trees (*Podocarpus totara*) of relatively small stature. Ground cover consisted of tradescantia (*Tradescantia fluminensis*) and climbing asparagus and was generally sparse throughout the lower reaches of the watercourse (Photo 2).

Photo 1. Riparian yard was dominated by elephant ear, arum lily and climbing asparagus.

Photo 2. Ground cover generally consisted of tradescantia or was bare.

Beyond the 20m riparian yard, an olive grove with rows of mature olive trees (*Lea europaea*) was present with agapanthus (*Agapanthus praecox*) amenity planting established within the rows of olives (Photo 3). Ground cover consisted of mown grass including buttercup (*Ranunculus* spp.) and clover (*Trifolium spp.*). On the southern boundary, dense, large vegetation was established, including, karamu (*Coprosma robusta*), pampus (*Cortaderia jubata*), Chinese fan palm (*Trachycarpus fortunei*) and cabbage tree (Photo 4).

Photo 3. Arum lily and agapanthus was established within the olive tree grove.

Photo 4. Mixed native and exotic vegetation present on the southern boundary.

On the western side of the site, a large mown field and driveway was present with queen palm and occasional lemonwood (*Pittosporum eugenioides*) amenity planting was established on either side of the driveway. A shelter belt of mixed exotic and native vegetation was established between the field and site boundary (Photo 5) including, cabbage tree, bamboo (*Bambusa glaucescens*), harakeke (*Phormium tenax*), and a single juvenile kānuka (*Kunzea ericoides*). The northern portion of the site included amenity planting of jade plant (*Crassula ovata*), and elephant bush (*Crassula portulacaria*) around the bowls club (Photo 6). On the northern boundary of the site, a shelter belt including eucalypt, honey locust (*Gleditsia tricanthos*) and tree privet (Photo 7) was established. Within the eastern carparking area, amenity planting of mixed exotic and native vegetation was established, including eucalypt and cabbage tree (Photo 8).

Photo 5. Shelter belt of mixed exotic and native vegetation with large mown field.

Photo 6. Amenity planting established around the lawn bowls club.

Photo 7. Shelter belt of exotic vegetation on the northern boundary.

Photo 8. Mixed exotic and native vegetation within the eastern car park.

Table 4. List of vegetation observed within the site. Classifications are from de Lange et al., (2017) and Auckland's Regional Pest Management Strategy (RPMS).

Species Name	Common Name	Status
Agapanthus praecox	Agapanthus	Exotic – Pest Plant
Zantedeschia aethiopica	Arum lily	Exotic – Pest Plant
Bambusa glaucescens	Bamboo	Exotic – Pest Plant
Banksia integrifolia	Banksia	Exotic
Plectranthus ecklonii	Blue spur flower	Exotic – Pest Plant
Paraserioanthes lophantha	Brush wattle	Exotic – Pest Plant
Ranunculus spp.	Buttercup	Exotic
Cordyline australis	Cabbage tree	Native – Not Threatened
Cupressaceae spp.	Cedar	Exotic
Trachycarpus fortunei	Chinese fan palm	Exotic – Pest Plant
Asparagus scandens	Climbing asparagus	Exotic – Pest Plant
Trifolium spp.	Clover	Exotic
Crassula portulacaria	Elephant bush	Exotic
Alocasia macrorrhiza	Elephant ear	Exotic – Pest Plant
Eucalyptus spp.	Eucalypt	Exotic
Lavandula stoechas	French lavender	Exotic
Calystegia sylvatica	Great bindweed	Exotic
Phormium tenax	Harakeke	Native
Gleditsia triaconthos	Honey locust	Exotic
Hedera helix	Ivy	Exotic – Pest Plant
Crassula ovata	Jade plant	Exotic
Kunzea ericoides	Kānuka	Native – Nationally Vulnerable
Corynocarpus laevigatus	Karaka	Native – Not Threatened
Coprosma robusta	Karamu	Native – Not Threatened
Piper excelsum	Kawakawa	Native
Pennisetum clandestinum	Kikuyu	Exotic – Pest Plant
Pittosporum eugenioides	Lemon wood	Native – Not Threatened
Ipomoea indica	Morning glory	Exotic
Araujia sericifera	Moth plant	Exotic – Pest Plant
Tropaeolum majus	Nasturtium	Exotic – Pest Plant
Rhopalostylis sapida	Nikau	Native – Not Threatened
Olea europaea	Olive tree	Exotic
Setaria palmifolia	Palm grass	Exotic – Pest Plant
Cortaderia jubata	Pampus grass	Exotic – Pest Plant
Phoenix canariensis	Phoenix palm	Exotic – Pest Plant
Cyathea dealbata	Pōnga	Native – Not Threatened
Ampelopsis glandulosa	Porcelain berry	Exotic – Pest Plant
Vitex lucens	Pūriri	Native – Not Threatened
Syagrus romanzoffiana	Queen palm	Exotic
Myrsine australis	Red matipo	Exotic – Not Threatened
Dacrydium cupressinum	Rimū	Native – Not Threatened

Rosaceae spp.	Rose	Exotic
Salvia rosmarinus	Rosemary	Exotic
Impatiens sodenii	Sods balsam	Exotic – Pest Plant
Acacia longiflora	Sydney golden wattle	Exotic – Pest Plant
Podocarpus totara	Tōtara	Native – Not Threatened
Tradescantia fluminensis	Tradescantia	Exotic – Pest Plant
Aloe arborescens	Tree aloe	Exotic
Ligustrum lucidum	Tree privet	Exotic – Pest Plant
Carex flagellifera	Trip Me Up	Native – Not Threatened
Nephrolepis cordifolia	Tube ladder fern	Exotic – Pest Plant
Cyperus albostriatus	Umbrella sedge	Exotic
Pseudopanaz arboreus	Whauwhaupaku	Native – Not Threatened
Dicksonia fibrosa	Whekī-pōnga	Native – Not Threatened
Hedychium gardnerianum	Wild ginger	Exotic – Pest Plant
Salix spp.	Willow	Exotic – Pest Plant
Solanum mauritianum	Woolly nightshade	Exotic – Pest Plant
Achillea millefolium	Yarrow	Exotic – Pest Plant

There was a high diversity of vegetation within the site however a majority of plant species observed are considered exotic pest plants were exotic pest plants and approximately a quarter of total vegetation observed to be native. Overall the botanic value of the vegetation throughout the site was considered to be of **Low** botanic value due to the dominance of pest vegetation and low abundance of native vegetation.

3.2.2 Avifauna

For native birdlife, it is important to have a healthy, dense and diverse range of native vegetation present to provide year-round sources of food and habitat. Three native birds were observed on site; tūī (*Prosthemadera novaeseelandiae*), fantail (*Rhipidura fuliginosa*), and red-billed gull (*Larus novaehollandiae scopulinus*) (Table 5). Fantail and tūī were the most commonly seen native birds within the site and were only observed within the riparian margins were native vegetation was densest. The close proximity to small SEA-Ts and a large SEA-M suggests other 'Not Threatened' and common native birds and coastal birds may access and utilise the site including; grey warbler (*Gerygone igata*), ruru (*Ninox novaeseelandiae*) and silvereye (*Zosterops lateralis*). All other birds observed were exotic species and only one 'At Risk' bird was observed on site, the red-billed gull. It is possible that other red-billed gulls may visit and utilise the site on an intermittent basis.

Habitat available for native birds to utilise for nesting and foraging include predominantly exotic vegetation with native plants such as kānuka, karamu, cabbage trees, and red matipo able to provide resting or foraging habitat. Habitat quality was considered low-moderate due to the diverse range of native vegetation; however, the area was also dominated by exotic vegetation and several pest plants. The overall avifauna value of the site was assessed to be **Low** due to the low-moderate habitat quality present throughout the site and low diversity of native avifauna observed.

Table 5. Birds recorded on site during opportunistic bird survey. Classifications are from Robertson et al., (2016).

Scientific name	Common Name	Status
Turdus merula	Blackbird	Introduced - Naturalised
Platycercus eximius	Eastern rosella	Introduced – Pest
Rhipidura fuliginosa	Fantail	Native – Not Threatened
Passer domesticus	House sparrow	Introduced - Naturalised
Acridotheres tristi	Myna	Introduced - Naturalised
Larus novaehollandiae scopulinus	Red-billed gull	Native – At Risk
Turdus philomelos	Thrush	Introduced - Naturalised
Prosthemadera novaeseelandiae	Tūī	Native – Not Threatened

3.2.3 Herpetofauna

Herpetofauna (reptiles and amphibians) make up a significant component in New Zealand's native terrestrial fauna with over 100 endemic taxa currently recognised (van Winkel *et al*., 2018). All indigenous reptiles and amphibians are legally protected under the Wildlife Act 1953, and vegetation and landscape features that provide significant habitat for native herpetofauna are protected by the Resource Management Act 1991. Statutory obligations require management of resident reptile and amphibian populations where they or their habitats are threatened by disturbance or land development.

Whangaparāoa supports a high diversity of native herpetofauna with six species known to occur within the area, including: copper skink (*Oligosoma aeneum*), ornate skink (*Oligosoma ornatum*), moko skink (*Oligosoma moco*), forest gecko (*Mokopirirakau granulatis*), elegant gecko (*Maultinus elegans*), and pacific gecko (*Dactylocnemis pacificus*). Copper and ornate skinks have adapted relatively well to living in surrogate habitats such as rank grass and vegetation dominated by dense exotic weeds. Although such areas are typically considered to have low ecological value, they still provide important habitat and often support protected lizards. No native herpetofauna was observed on site and the habitat assessment revealed scattered leaf litter and thick groundcover within the upper reaches of the watercourse on site which may provide habitat for native skinks. The presence of kānuka and tōtara trees may provide habitat for native geckos, with the canopy within the riparian yard providing adequate cover and connectivity between large native trees. Beyond the riparian yard, habitat available for native lizards was highly limited with a small patch of rank grass providing the only potential refuge for skinks.

Overall, the ecological value of the site as they pertain to indigenous lizards is considered to be limited to the riparian yard of the stream and small patch of rank grass. As such the herpetofauna habitat value of the site was assessed as **Low-Moderate** due to the presence of native trees and connectivity of the canopy, yet this was limited to a small area of the site.

3.2.4 Ecological Connectivity and Function

Connectivity between areas of vegetation is important to facilitate ecological function. Edge communities are heavily influenced by increasing exposure to light, drying winds, and competitive weeds. This "edge effect' restricts some native flora and fauna to forest interiors. Patch fragmentation

increases the edge effect and decreases the availability of habitat for interior species. Loss of connectivity can also impair reproductive function of both flora and fauna.

Currently, the vegetation present within the site is comprised of a high diversity of mixed native and exotic vegetation, with much of the site heavily infested with multiple exotic pest plants which is reflective of high edge effects. The site is located approximately 260m away from the closest Significant Ecological Area (Figure 4) and no green corridor connects the vegetation to the wider environment limiting the accessibility for native species. Overall the connectivity and ecological function of the site to the surrounding area was considered to be of **Low** ecological value.

Figure 4. Proximity of the site (yellow polygon) to indicated Significant Ecological Areas (green hatching = terrestrial, blue hatching = marine).

3.3 Freshwater ecology

Two significant (>25mm) rainfall events occurred in the month prior to site assessment and rainfall was generally sustained to low-moderate levels. In the week preceding site assessment a cumulative 35mm of rain fell, and 13.5mm of rain fell in the 48 hours prior to site assessment. The sustained rainfall and two significant rain events indicate the catchment was not completely dry and would likely result in the flow of intermittent streams.

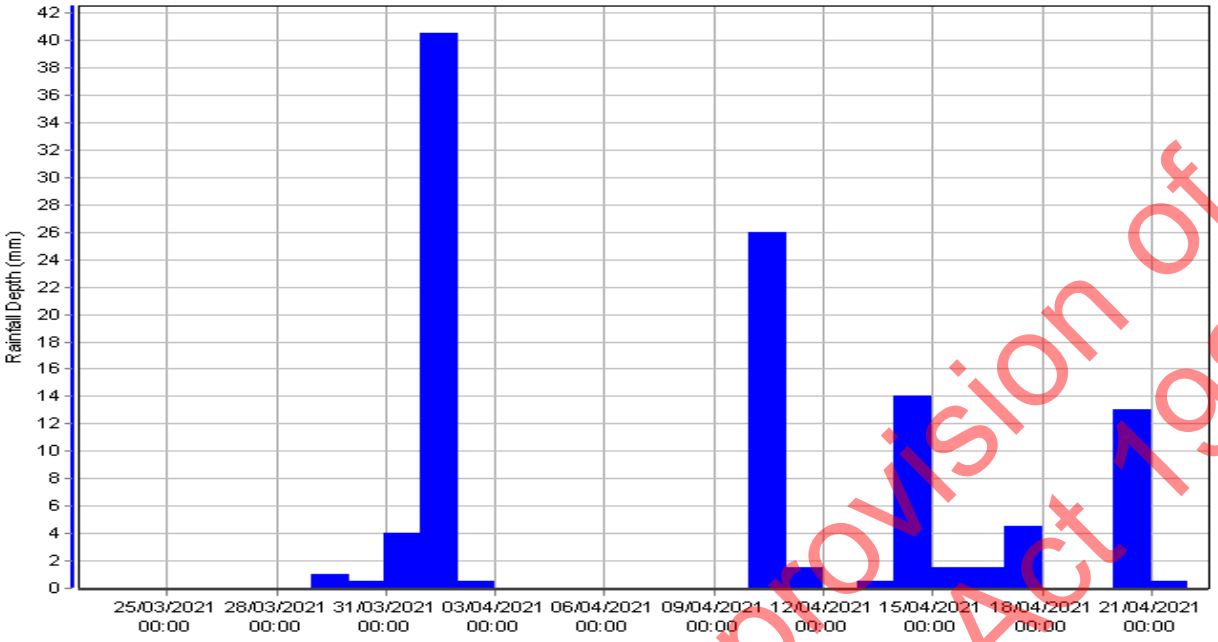

Figure 5. Totalled daily rainfall depth (mm) between 22/03/2021 – 22/04/2021 from Auckland Council Monitoring Site Orewa @ Treatment Ponds.

During the site assessment, one watercourse was identified flowing from a general north to south direction (Figure 2). The watercourse was identified as an intermittent stream, meeting all six criteria for classifying intermittent streams. The upstream environment consisted entirely of a piped stormwater network and the downstream receiving environment is largely piped. The stream flowed for approximately 3km before entering the marine environment through a northern arm on Stanmore Bay Beach. All other predicted overland flow paths were either ephemeral or absent.

The identified watercourse began through a large piped outfall, approximately 0.5m in diameter, with a large pool immediately under the outfall. The pool was approximately 2m long and 1.5m wide with an average water depth of 0.26m (Photo 9). The watercourse became more channelised with an average bank height of 0.59m and a wetted width of 0.3m. The depth of the water within the channel was variable with an average depth of 0.08m (0.06m-0.11m) and hydrological heterogeneity was relatively high with a range of runs, riffle and pools within the channel (Photo 10). Approximately 15m downstream of the stormwater outfall, a small waterfall was seen within the channel and was approximately 0.6m high and contained flowing water with a deep pool at the base (Photo 11). Beyond the site boundary, a confluence was observed with a tributary with highly incised channel, fed by a culvert and wingwall, approximately 2m above the channel bed due to extensive scouring (Photo 12). The main stem of the watercourse continued to flow for approximately 5m before passing through a culvert.

Photo 9. The watercourse was fed by a stormwater culvert with a large deep pool contiguous to the outfall.

Photo 10. Stream characteristics included pools, runs and riffles.

Photo 11. A small waterfall was present within the stream.

Photo 12. A culvert with approximately 2m drop to the steam bed within a side tributary just beyond the property boundary.

The dominant substrate within the channel consisted of compacted clay banks and beds and occasional small gravel and small-medium gravel (Photo 13). Iron flocc bacteria was established within much of the channel and in some pools, a hydrocarbon sheen could be seen on the water surface. Occasional woody debris and leaf litter were present within the channel and no macrophytes were observed. Riparian vegetation was generally limited to tradescantia, climbing asparagus and elephant ear, reducing ground filtration functions to the stream due to the shallow root systems (Photo 14). Shading was assessed as high with much of the canopy cover provided by, mature tōtara, moth plant (*Araujia sericifera*) and tree privet.

Photo 13. Substrate included compact sediment, cobbles and gravel with some iron flocc.

Photo 14. Riparian groundcover and associated filtration functions were generally bare or limited to tradescantia.

There was moderate abundance and biodiversity of fish cover and macroinvertebrate habitat that would be suitable to a diverse range of aquatic fauna. Habitat available for fish and macroinvertebrates included occasional woody debris, undercut banks, pools and hard substrates such as gravel and cobbles. However, the shallow water depth, lack of dense overhanging riparian vegetation and limited connection to the floodplain reduces quality of available fish spawning habitat. The New Zealand Freshwater Fish Database indicated three native fish species to have been observed within the wider catchment (Table 6). As the upstream portion of the catchment is entirely piped and much of the downstream reach contains extensive stormwater pipes it is expected that only shortfin eel (*Anguilla australis*) and potentially banded kōkopu (*Galaxias fasciatus*) may access the watercourse on an intermittent basis, during higher flow periods. The slow flow and culvert fed environment may limit other fish species from accessing and utilising the site.

Table 6. List of freshwater fish species recorded within the catchment at Stanmore Bay, Whangaparāoa. Data sourced from New Zealand Freshwater Fish Database. Classifications from Dunn et al., 2017.

Scientific Name	Common Name	Status
Anguilla australis	Shortfin eel	Not Threatened
Gambusia affinis	Gambusia	Introduced and Naturalised
Galaxias fasciatus	Banded kōkopu	Not Threatened
Gobiomorphus huttoni	Redfin bully	Not Threatened
Cyprinus carpio	Koi carp	Introduced and Naturalised

The watercourse present within the site was considered to have **Low-moderate** freshwater ecological value due to the moderate aquatic habitat quality and abundance which may only be suitable for a small range of native fish species. The watercourse contained a high degree of shading and high diversity of hydrological heterogeneity and hard substrates that may be used by indigenous freshwater fauna, however the very shallow water depth limits species which may be able to utilise them.

4 ASSESSMENT OF EFFECTS

The proposed development involves the construction of multiple units within the site which will involve the permanent removal of vegetation and increase the total area of impermeable surfaces within the site. However, there will be no increase in impervious surfaces within the riparian yard. No stream works are proposed, however the construction of a "nature-based playground" and associated vegetation removal will occur within 7m of the stream.

The primary adverse ecological effects of the proposed development during earthworks and construction is the potential for the release of excess fine sediment into the watercourse downstream of the works and potential loss of terrestrial ecological function through vegetation removal.

4.1 Effects to Botanic Value

Overall, the removal of vegetation proposed by the development is of low magnitude and is mainly limited to mown grass and exotic vegetation with a few specimens of 'Not Threatened' native vegetation (cabbage tree, nikau, karamu) on the south-western boundary of the site. Within the 20m riparian margin, it is likely some vegetation will likely be removed for the construction of a playground area. This is largely limited to exotic pest species (e.g. ginger, moth plant). Removal of pest vegetation and removal or alteration of vegetation that is outside of the riparian yard is a permitted activity under the AUP OP (E15.4.1 (A6; A22A)). The vegetation to be removed is of low botanic value to the site and the potential removal of few low stature native vegetation and will result in at most a low level of adverse effects. The overall adverse ecological effects of vegetation removal on botanic value was considered to be less than minor.

4.2 Effects to Terrestrial Fauna

The removal of vegetation on the proposed areas is expected to have very low impacts to both avifauna and herpetofauna. It is unlikely that native birds or lizards would utilise the habitats which would be affected through vegetation removal. While one 'At Risk' species, a red-billed gull, was observed on site it is highly likely this species only visited the site for intermittent resting and scavenging purposes.

4.3 Effects to Freshwater

No stream works are proposed within the watercourse present on site.

Minor vegetation removal is a proposed to occur within the 10m riparian yard. Vegetation removal within 10m of an urban stream is considered a restricted discretionary activity under the AUP OP (E15.4.1(A19)). The vegetation which is to be removed is predominantly pest plants and exotic species with few common native trees potentially required to be removed, as described above.

Due to the quality and magnitude of the riparian vegetation proposed to be removed, the potential adverse effects on freshwater ecological values and functioning (e.g. shading, filtration, bank stability and organic input) are considered negligible.

The removal of riparian vegetation within the riparian yard and earthworks within the wider site has the potential to discharge excess fine sediment into the stream and downstream receiving

environment. To minimise potential erosion and sediment input effects during and immediately after earthworks near streams, an Erosion and Sediment Control Plan should be prepared, working to the best practice guidelines as required by Auckland Council's erosion and sediment control guide GD05.

Provided the above recommendations are adhered to, then it is considered that the effects of the proposed development on freshwater ecological values are negligible.

All through not a requirement, it is recommended that protection, weed control and restorative native planting within the remaining riparian yard is undertaken. These enhancement actions would improve freshwater ecological functions provided by riparian vegetation, such as shading, bank stability and filtration and provide overall long term increases to the freshwater ecological values of the site. Additionally, riparian restorative planting would also provide for net biodiversity gains in terrestrial ecological values.

5 REFERENCES

de Lange P.J., Rolfe J.R., Barkla J.W., Courtney S.P., Champion P.D., Perrie L.R., Beadel S.M., Ford K.A., Breitwieser I., Schönberger I., Hindmarsh-Walls R., Heenan P.B. and Ladley K. (2017).

Conservation status of New Zealand indigenous vascular plants. *New Zealand Threat Classification Series 22*. Department of Conservation, Wellington: 82p.

Robertson H.A., Barid K., Dowding J.E., Elliott G.P., Hitchmough R.A., Miskelly C.M., McArthur N., O'Donnell C.F.J., Sagar P.M., Scofield R.P. and Taylor G.A. (2016).

Conservation status of New Zealand birds. *New Zealand Threat Classification Series 19*. Department of Conservation, Wellington: 27p.

Roper-Lindsay J., Fuller S.A., Hoosen S., Sanders M.D., and Ussher G.T (2018)

Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

Singers N., Osborne B., Lovegrove T., Jameison A., Boow J., Sawyer J., Hill K., Andrews J., Hill S, and Webb C. (2017).

Indigenous terrestrial and wetland ecosystems of Auckland. Auckland Council.

van Winkel, D; Baling, B; Hitchmough, RA (2018)

Reptiles and amphibians of New Zealand: A field guide. *Auckland University Press, Auckland, New Zealand.* 376 pp.

6 APPENDIX

Proposed site plan for 20 Melia Place and 43a Vipond Road, Stanmore Bay, Auckland

1 PROPOSED OVERALL DEVELOPMENT – TYPOLOGIES (OPTION 6)
SCALE: 1 : 500