

TO: Todd Elder
Auckland Council

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FROM: Annabelle Coates

WHENUAPAI BUSINESS PARK – STREAM CONDITION ASSESSMENT

Introduction

Neil Construction Limited is applying to Auckland Council for a Private Plan Change (PPC) to rezone the land at 141-159 Brigham Creek Road and 69, 71, 73, 94, 96 and 96a Trig Road, Whenuapai ('the site'). The PPC seeks to rezone approximately 47 ha of land from Future Urban Zone to Business - Light Industry Zone in an integrated and comprehensive manner.

Auckland Council requested further information under clause 23 of the First Schedule of the Resource Management Act (1991) regarding stream erosion and the ability of the stream bed and banks to withstand any changes in the hydrological regime that may result from the change in land use.

The contents of this memorandum provide a condition assessment of the permanent and intermittent stream within the site. It is intended to partially fulfil the s23 requirement.

Methodology

The site was visited on 8 April 2024. The site visit partially replicated a watercourse survey that was prepared for Neil Construction Limited in 2020. The 2020 survey provided photo points at various stages along the watercourses and provided a physical survey of the channels, including widths at periodic locations. The author of this memo (who also completed the site work) has previously completed extensive open waterway condition assessments (approx. 100 km), including identifying and quantifying faults, damage, lining materials, and drainage values.

The 2020 physical survey was not repeated. The survey photo points were revisited with new photos taken during April 2024. Each photo point was replicated as closely as possible. Exact replication was not always possible. During the 2020 survey the stream appeared to be largely dry, while water was present within the channel along much of the permanent reach during the 2024 survey.

Any obvious areas of damage, such as scour, erosion, and bank collapse were noted, along with general comments about the condition of the channel, including the state of vegetation.

Condition Assessment

A plan showing photo points is provided in Attachment A. Where possible, the 2020 and 2024 photos are presented side by side, with commentary provided below each.

Photo point C

2020



2024



Photo point C was located near the upstream extent of the watercourse. The channel was represented by a formed, but shallow depression. Leaf litter and debris was present on the base suggesting no recent flushing flows. No significant changes in the reach of stream were observed with the exception of continued growth of vegetation. Exotic weeds such as woolly nightshade and privet were abundant and appeared to be more prolific than during the 2020 survey. Channel form was largely unchanged despite the significant flood event in 2023.

Photo point E1

2020



2024



Photo point E1 was located directly south of the Spark NZ facility on Brigham Creek Road. The channel was moderately incised during both the 2020 and 2024 surveys. There were no significant changes in channel condition, despite the significant 2023 flood event. Vegetation growth along the channel banks had increased, likely due to the removal of grazing stock.

Photo point H2

2020



2024



Photo point H2 was located in what would have been the front garden of the main house at 151 Brigham Creek Road, which has been demolished. There were no significant changes in the channel or banks, despite the 2023 flood event. The channel was defined and not incised. During both surveys, the channel contained terrestrial vegetation, indicating it is not regularly inundated. The banks were characterised by abundant agapanthus, along with other garden and ornamental plants and trees.

Photo point K

2020



2024



Photo point K was located looking upstream, towards the culvert (indicated by the red arrows) that would have provided access to the main house at 151 Brigham Creek Road (now demolished). The channel was ill defined, and occupied a shallow vegetated depression. During both surveys the channel was entirely filled with leaf litter, suggesting no flushing flows. There was no evidence of scour or erosion, including around the culvert. Pest plants such as agapanthus and arum lily were abundant during both surveys.

Photo point L

2020



2024



Photo point L could not be perfectly replicated due to the presence of water. It was located looking upstream, towards the upstream end of the artificial pond located at the confluence of the two main intermittent channels. The banks were well defined, as expected of a constructed pond. There was no undercutting, scour or areas of obvious erosion, despite water being present during 2024, but not during 2020. The perimeter of the pond was stable, likely the result of the significant vegetation in the immediate surrounds.

Photo point L3

2020



2024



Photo point L3 was located on the intermittent tributary that flows from the stormwater pond within the airbase on the opposite side of Brigham Creek Road. The watercourse was ill defined. The main difference between the two surveys was the proliferation of vegetation, including mixed pasture grasses, blackberry and pampas, attributable to the removal of stock from the paddock. The 2020 survey yielded significant pugging on this reach, however no pugging was observed during 2024, due to the lack of stock. The watercourse was considered to be more stable in 2024, despite the significant floods experienced in 2023, likely due to the removal of stock from the paddocks.

Photo point M

2020



2024



Photo point M was located at the downstream end of the artificial pond. The photo point could not be replicated due to the presence of water within the pond. The 2020 image was taken from within the pond when it was dry. Despite not being able to replicate the photo, the banks of the pond were observed. No evidence of scour, erosion or bank undercutting were observed, suggesting the outlet of the pond was stable, despite the significant floods that occurred in 2023. The vegetation growth around the pond has likely contributed to bank stability.

Photo point O

2020



2024



Photo point O was located downstream of the constructed pond, looking downstream. The channel during both surveys was ill defined, and contained no obvious flow or non-vegetated channel. Cattle were present during 2020, which have likely caused the shallowness of the channel through pugging and trampling. During 2024 there was some water present, though the channel can be more accurately described as damp ground rather than a flowing channel, however the channel was no more defined than 2020, despite the high flows experience during 2023, and the removal of cattle from the paddocks.

Photo point Q

2020



2024



Photo point Q was located on a culvert crossing, looking upstream towards the constructed pond (which is located in the vegetated area in the distance). The watercourse was contained within a defined, but shallow channel, which widened towards the upstream end of this photo where it became less defined. The channel was well vegetated during both surveys, with blackberry encroaching along the entire length during the 2024. There was no evidence of any scour or erosion, including around the culvert. Some water was present during 2024, however it can be more accurately described as a damp channel, rather than flowing or standing water.

Photo point R

2020



2024



Photo point R was located downstream of the culvert crossing within an area of native dominated vegetation. The wetted channel was present, but not easily defined. It was present in a generally low area. There were no obvious changes between the two surveys. During 2024 water was present, however it was not flowing and it formed a series of isolated, stagnant pools. Abundant leaf litter was present within the channel suggesting no recent flushing flows. No evidence of scour, erosion or channel damage was identified.

Photo point U

2020



2024



Photo point U was located close to Brigham Creek Road. The channel was shallow, and moderately incised, and located within an area of mixed vegetation, with a high incidence of weeds. Water was present during the 2024 survey, but did not appear to be present during 2020. Water was not flowing during 2024, rather it was present as a shallow, stagnant pool. Extensive leaf litter was present during both surveys suggesting no recent flushing flows. No evidence of scour or erosion were observed.

Photo point V

2020



2024



Photo point V was taken looking downstream towards a culvert crossing. The channel was well defined, and contained within relatively steep, but not incised banks. During both surveys vegetation was abundant on the channel banks and around the culvert. There were no obvious differences between the two surveys, and no evidence of scour, erosion or bank damage.

Photo point W

2020



2024



Photo point W was the only location where there was evidence of erosion observed. The photo point was located downstream of a culvert crossing, looking downstream. The channel was well defined, with the wetted area slightly incised. Water was present, during 2024 though flow was not obvious. The channel was dry during 2020. On the true left bank an area of slumping was present during 2024 (indicated by the red arrow). As a result, a gap of approximately 0.5 m was present between the ground level and the fence. Where the slumping has occurred, the bank is steep. The slumping does not appear to have been caused by the flow of the stream. Rather, it is likely overland sheet flow, potentially from Brigham Creek Road, has made its way towards the stream via an ephemeral flow path, resulting in the bank slumping. The slumping itself is above the normal level of the stream, on the upper bank. It is expected this area will continue to erode during periods of high flow, though it is noted that high flows appear to be uncommon.

Photo points V1 and V2

V1 2020



V1 2024



V2 2020



V2 2024



Photo points V1 and V2 were located on the opposite side of Brigham Creek Road on a channel that drains a constructed pond, and flows through a culvert under Brigham Creek Road and into the watercourse within the site. The channel was ill defined, and was represented by a shallow depression rather than a formed channel. The area was entirely vegetated. Vegetation was significantly more dense during 2024 than 2020. No evidence of scour, erosion of channel damage was observed.

Photo point Z

2020



2024



Photo point Z was located along the Brigham Road embankment, near its intersection with Kauri Road. The channel not easily observable during 2024 due to vegetation growth, while it was readily visible during 2020. The extensive vegetation growth suggests the channel and banks are stable enough to allow vegetation to proliferate. No evidence of scour or erosion were observed, including around the culverted entry between 159 and 163 Brigham Creek Road, which was where the photo was taken from.

Photo points Z2 and Z3

Z2 2020



Z2 2024



Z3 2020



Z3 2024



Photo points Z2 and Z3 were located at the downstream end of the watercourse, where it flows under Brigham Creek Road. Neither photo point could be fully replicated due to the depth of the water within the stream. However, extensive vegetation was present during both surveys and there was no evidence of any scour, erosion or channel damage observed, despite the high flows experienced during 2023.

Summary

Generally, the condition of the intermittent and permanent waterways within the site was good. There was largely no evidence of erosion or scour, or other bank damage such as undercutting, slumping, cracking or undermining of vegetation. The only exception was an area of bank slumping around photo point W. The removal of stock from the site has resulted in vegetation growth increasing, though there were no obvious improvements in channel condition, such as narrowing of the channel and resumption of a more natural cross section. It is likely the lack of regular flows has prevented normal stream processes, such as a normal level of erosion, occurring. The extensive vegetation along large portions of the riparian margin are also likely playing a stabilising role for the watercourses. Removal of vegetation may increase the risk of the erosion, however this can be easily mitigated through planting of the riparian yard, appropriately engineering culverts and crossings, and addition of rock rip rap in any erosion prone areas such as bends in the channel.

Overall, there were no significant differences found between the 2020 and 2024 surveys with regard to stream channel condition. The flood events the Auckland region experienced during 2023, which

represented an unprecedented, significant stormwater event, did not appear to have cause any erosion, scour or damage to the banks of the stream. Therefore, the stream bed and banks show a high degree of resilience to changes in hydrological regime. The proposed stormwater controls and stormwater management plan provisions should be sufficient to address any effects on the stream caused by the change in land use.

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