Appendix Q: Ecological Guidelines and Methodologies

1.1 Australian and New Zealand Guidelines for Fresh and Marine Water Quality

The Australia and New Zealand Water Quality Guidelines 2018 (ANZWQG, formerly ANZECC) is a joint initiative of the Australian and New Zealand governments to provide authoritative guidance on the management of water quality in Australia and New Zealand. Within New Zealand, regional councils are responsible for administering the guidelines.

The ANZWQG provide detailed approaches and advice on identifying appropriate guideline values for selected indicators to protect aquatic ecosystems. These guideline values help to ensure that agreed community values and their management goals are protected. The ANZWQ note that locally derived guideline values are most appropriate.

The Marine Ecological Assessment (Appendix I) and Freshwater Ecological Assessment (Appendix H) have discussed the applicability of the ANZWQG to the Proposal within the reports respectively. The assessments have used monitoring data and hydrodynamic modelling to understand the levels of contaminants discharged in the process and stormwater discharges from the Steel Mill and used the ANZWQG as a basis to determine the extent of the effect on the Receiving Environment.

1.1.1 Environment Institute of Australia and New Zealand (EIANZ) Ecological Impact Guidelines

The Environment Institute of Australia and New Zealand (EIANZ) developed Ecological Impact Assessment guidelines (EcIAG) to define a process for identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components; and providing a scientifically defensible approach to ecosystem management.

Using a standard framework and matrix approach such as this provides a consistent and transparent assessment of ecological effects and is considered to be best industry practice. The EcIAG framework provides a robust structure but needs to incorporate sound ecological judgement to be meaningful.

The guidelines include a three-step assessment process as follows:

1 Identifying the ecological value of the existing environment (in this application, the 'Receiving Environment'). Ecological values are assigned on a scale of 'Low' to 'Very High' based on species, communities, and habitats, using EcIAG criteria;

2 Assessing the magnitude of ecological effect from the proposed activity on the Receiving Environment; and

3 Determining the overall level of effect, based on both the value and magnitude of effect, to determine if measures to avoid, remedy or mitigate effects are required. Once all avoid, remedy and mitigate options are taken into consideration, determine whether there are still residual effects that need addressing, and if so, propose offsetting or compensation measures.

Whilst these guidelines are designed for freshwater and terrestrial systems, a version of the guidelines for marine systems has been developed by Boffa Miskell and then modified further to apply to the current Proposal[1].

[1] The characteristics of marine and estuarine sites with Negligible to Very High ecological values were originally developed by Dr Sharon De Luca, Boffa Miskell Ltd, then modified further in the Marine Ecological Assessment (Appendix I) to provide a transparent approach that can be replicated. The characteristics have been accepted by decision-makers in Environment Court and Board of Inquiry hearings, including a number of NZTA projects (Transmission Gully, MacKays to Peka Peka, Ara Tūhono Project Puhoi to Warkworth and Warkworth to Wellsford Sections). Table 2 in Appendix B of the Marine Ecological Assessment is based on the approach taken in these projects, and has been further developed with additional available indices to improve its use for the current consent applications. In respect to freshwater, the methodology was also adapted slightly for different fauna and ecosystem types.

The EcIAG framework bring together the values of the Current Environment (and then assumptions have been made to determine the ecological values of the Receiving Environment), the magnitude of effects of the proposed activity on the Receiving Environment which are then used to determine an overall level of effect of the activity. Both the Marine and Freshwater Ecological Assessments (Appendix I and H respectively) have adopted this methodology.

The EcIAG specify that effects that are Moderate and above warrant further effects management, which, in this case, are proposed to be addressed through a residual effects management and monitoring programme. There are effects that arise in the CMA that warrant further effects management. While offsetting cannot be achieved for the residual effects that have been identified, the intent is to adhere to biodiversity compensation guidelines as far as practicable to ensure that appropriate actions are taken to balance the residual adverse effects.

1.1.2 Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland streams (Auckland Council Technical Report TR2011/009)

The SEV was developed to quantify the ecological value of streams in a consistent manner to inform resource management decisions. The SEV assessment determines freshwater habitat and ecological function of a stream reach at least 100 metres long (including assessment of bed type, channel shape, average width, sediment coverage, shade and the presence/absence of any aquatic vegetation). Site specific macroinvertebrate and freshwater fish data were also included in the SEV assessment undertaken to support this application. An overall SEV score was calculated for each site (out of a possible 1), with higher scores indicating better quality freshwater habitats.

A Stream Ecological Valuation (SEV) survey was undertaken at seven of the ecological monitoring sites (Site A, Site C, Site 6, Site 2, Site 4, Kahawai Upstream and Kahawai Downstream). The SEVs conducted on permanent streams were carried out in accordance with the methods set out in the Auckland Council Technical Report 2011/009. The exception to this was the intermittent Kahawai Upstream site that was surveyed in accordance with the methods set out in Auckland Council Technical Report 2016/023.