

Appendix G

## Ecology Review (Kessels and Associates Ltd)





31 March 2008

Beca Carter Hollings & Ferner Ltd.,  
PO Box 448  
HAMILTON

Attn: Richard Douch

Dear Richard

**Te Rapa Bypass Project  
Ecological Review, Adequacy of Section 92 Response and Response to Relevant  
Submissions**

**1 INTRODUCTION**

Qualifications and experience

- 1.1 My full name is Gerardus Henricus Anthonius Kessels. I am managing director of Kessels & Associates Limited, a specialist ecology assessment consultancy, established in 1999. Kessels & Associates currently employs three fulltime ecologists and four part-time ecologists, as well as regularly utilising expertise from other organisations, such as the University of Waikato and Landcare Research, when required.
- 1.2 I have nineteen years experience in the fields of ecology and resource management planning. I hold a Bachelor of Science Degree majoring in zoology, completed in 1988 and a Master of Philosophy in Resource and Environmental Planning (1<sup>st</sup> Class Honours), completed in 1999, both from Massey University. I am a member of the Freshwater Sciences Society of New Zealand, the New Zealand Ecological Society, a member of the Ornithological Society of New Zealand and an affiliate member of the New Zealand Planning Institute.

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## 2 FURTHER INFORMATION REQUEST

The information requested pursuant to Section 92 of the RMA is detailed in objectives 55 and 56 of the Te Rapa Bypass – Section 92 Response Report: (Opus International Consultants):

*55. Please provide a plan(s) showing the stormwater catchments, proposed drainage and treatment measures (including likely dimensions) and the proposed stormwater discharge points. We note that this information may be provided in the drainage plans referred to in Appendix A, but not included in the application documents. Please also discuss how the above relates to the stormwater networks proposed under the Rotokauri Structure Plan.*

*56. Due to the streams fisheries values there should be accommodation for enhancement in terms of riparian plantings. Please provide comment on what riparian planting is intended to be provided within landscape plans.*

The Opus response to objective 55 is considered to be adequate for the treatment of stormwater runoff from the Te Rapa Bypass. It should be noted that it is important to determine that the grass swales are working effectively to ensure contaminant removal and retention. If at all possible a second long term stormwater retention pond should be created to collect and store stormwater in case of an accidental spillage. Due to the high traffic use of the bypass and the close proximity to the Waikato River, retention of stormwater in a pond prior to discharge to the receiving environment may be needed. A retention pond would be necessary to intercept any accidentally spilled contaminant which could then be removed and discarded before entering the receiving environment.

We agree with the provisions set out in the response to objective 56. We understand that the land management regime and ownership may inhibit the extent of riparian vegetation planting. However, planting where possible with the riparian plants outlined in the s92 reply should be conducted.

Although limited fish species may occur in some of the streams within this area provisions should be put in place for culverts with fish access (which does not appear to be outlined in the s92 report). Fish access is considered to be important because further work in the area is likely to increase the habitat quality of the streams, thereby enhancing stream suitability for a wider range of fish species. It is important to consider and design fish friendly culverts prior to installation to reduce the need to retrofit in the future. "CULVERT" software, which predicts the suitability of culverts for fish passage, indicates that a box culvert design (as proposed) would create obstacles for swimming fish passage such as inanga (although the lengths proposed are short). Therefore baffles and resting places would have to be installed at minimum intervals of every 3.55.m (which is particularly important for the Avalon/Exelby Road culvert which is the longest at 7.1m). It is also important for the culvert base at the outlet to be below the natural stream bed by approximately 30 cm. Rocks and boulders should be installed on the stream bed (and sides where erosion is likely to occur) at the outlet of the culvert to decrease the incidence of erosion.

### **3 ASSESSMENT OF ECOLOGICAL SENSITIVITY**

Kessels and Associates undertook an ecological assessment of effects in the vicinity of the proposed Te Rapa Bypass in February 2006 as part of the Rotokauri Structure Plan on behalf of Hamilton City Council, which provides a useful benchmark with which to assess the potential adverse ecological effects of the proposed Te Rapa Bypass.

Two streams sampled during the Rotokauri Structure Plan survey will be directly affected by the proposed bypass - located on Te Kowhai Road and Ruffell Road. These two streams have a relatively high conductivity at 260 and 290  $\mu\text{S}/\text{cm}$  (indicating high suspended sediment and/or contaminant concentrations). No fish were captured at the Ruffell Road site, while only the pollution tolerant shortfin eel was captured at Te Kowhai Road site. However, many of the other streams located in this area have high ecological value and habitat.

#### **3.1 Water Quality**

The water quality results show that all of the sites sampled within agricultural dominated landuse had elevated nitrogen concentrations and high suspended solids, even in low base flows. The temperature results were variable with values between

17.3 and 24.4°C, the temperatures of the streams depended on riparian cover/shade of a stream. All of the sites, apart for one, had bacteria counts well above ANZECC 2000 recreational contact and stock drinking water standards.

### **3.2 Macroinvertebrates**

The in-stream fauna at all of the sites in the Rotokauri catchment was found to be typical of highly modified, nutrient-enriched North Island streams, with the highly pollution tolerant fly species (Tanypodinae/Tanytarsini larvae) and caddisfly (e.g. *Oxyethira albiceps* & *Triplectides cephalotes*) common. The native freshwater snail, *Potamopyrgus antipodarum*, was commonly found, but more commonly found was the introduced freshwater snail - Lymnaeidae.

Chironomid larvae (blood worms) were very common at several of the sites. When found in these numbers, this species is a strong indicator of very low habitat quality with extremely low dissolved oxygen concentrations.

Most tellingly, no larvae of sensitive mayfly, stonefly or caddisfly species were found. This infers that the streams which the proposed bypass may cross are less sensitive to sediment and contaminant discharges.

### **3.3 Fish fauna**

The fish fauna is typical of such streams in the Waikato (Collier *et al.* 1998; Duggan *et al.* 2002). Short-finned eels were well represented in all of the waterways, but do tolerate highly modified environments.

The occasional long-fin eel was present in the waterways within the study area (BECA, 2001). This eel is less common in lowland streams than the short-fin as it prefers more intact mid & upland streams with good riparian margins. Long-fin eel is listed as "*Chronically threatened species in gradual decline*" (Hitchmough, 2007). The affected streams presently provide poor habitat opportunities for this species, which tends to prefer well vegetated streams with reasonably frequently occurring pool habitats and overhung banks.

Giant kokopu are a Nationally Threatened Species (Hitchmough, 2007) and have been recorded in the Rotokauri catchment (NIWA (BECA 2001), they were also captured during the February 2006 survey undertaken by Kessels and Associates in a stream draining into Lake Rotokauri accessed off Exelby Road.

While the affected waterways associated with the proposed bypass are unlikely to provide habitat for this threatened fish at present, it is important that any stream crossings do not preclude access into these streams in the future by poor culvert design. Given the focus of ecological restoration work being carried out in the locality it is quite possible that these degraded streams will be restored in years to come.

#### **3.4 Wetland and Terrestrial fauna**

Birds noted during the Kessels and Associates 2006 survey included mallard duck, fantail, greywarbler, welcome swallow, house sparrow, pheasant and pukeko. Pukeko were common and used the pasture adjacent to their gully roosting and nesting sites as feeding habitat. Several mallard duck were observed to be nesting along the length of all of the streams.

Grey duck, black swan, Canada goose, paradise duck, shag species have also been recorded within Horseshoe Lake and Lake Rotokauri in past surveys (BECA, 2001).

Rare and threatened bird species such as fernbird, marsh crake, spotless crake and Australasian bittern are highly unlikely to be present within the waterways in this locality given the fragmented and modified nature of the habitat. Although, they could still persist or utilise seasonal habitat along the margins of Lake Rotokauri.

Introduced predators, especially possums, feral cats, mustelids and rats are likely to be widespread and common.

The proposed bypass is unlikely to adversely impact on avi-fauna or their habitats within this locality.

#### **4.0 COMMENTS ON SUBMISSIONS**

The relevant ecology submissions were located under the ecology section of the 'summary of submissions by issue' report. One issue was highlighted in this section submitted by Tim Manukau of Waikato Rautapu Trustee Company. This submission *'seeks mitigation measures to include ongoing sediment control, the restoration of receiving environs that may be used for construction and highway stormwater; implementation of appropriate stormwater treatment processes and other relevant environmental protection mechanisms'*.

The concern of ongoing sediment control appears to be addressed with the installation of the grass swales at the toe of the road formation on both sides of the bypass. Runoff should flow through these grass swales before entering the receiving environment. Grass swales are considered appropriate in this catchment as they will allow stormwater storage, and treatment through the removal of sediments.

The grass swales and possible addition of a treatment pond are considered to adequately deal with contaminants to the waterways indicated in objective 38 of the submissions by issue report.

The following procedures should be implemented within the area of works to ensure stream ecosystems are protected during the construction phase:

- Stormwater from all exposed cuts, fills and preloads shall be diverted through silt traps (i.e., geotextile barriers or hay-bale bunds), and discharged through sediment ponds before entering the swales/streams in accordance with Environment Waikato recommended design standards for sediment control.
- Machinery shall avoid working directly within the stream outside of the road platform wherever possible.
- All machinery shall be in good working order with no leaking hydraulic or fuel systems.
- Refuelling shall be carried out at least 20 metres from any watercourse. All refuelling shall be undertaken at designated fuel refill sites.
- All exposed batters and preload areas shall be either hydro-seeded with grass or re-vegetated with appropriate indigenous plants and/or wrapped in geotextile material.

## **5.0 KEY RECOMMENDATIONS**

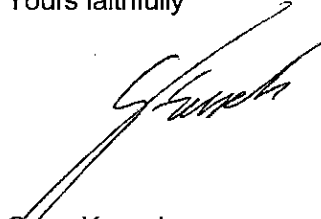
- Installation of a long term stormwater retention pond if possible.
- The installation of culverts which allow access for a wide range of fish species.

- Riparian planting to mitigate loss of habitat where possible.

## 6.0 CONCLUDING REMARKS

The proposed Te Rapa Bypass dissects a landscape with virtually no ecological significance. It does, however, cross several streams which flow into the Waikato River and have ecological restoration potential even though they are highly degraded at present. Provided that the applicant's proposed sediment and contaminant control methods are adopted, along with my recommendations outlined in Section 5 above, the ecological effects of this proposal are considered to be no more than minor.

Yours faithfully



Gerry Kessels  
BSc (zoo), MPhil (hons 1)  
**Senior Ecologist**

Kessels & Associates Ltd

