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19 March 2020

Kathryn Drew and Perry Empson
Resource Officer
Waikato Regional Council

Dear Kathryn and Perry

Gleeson Quarry - Fill Site 2, 3, 4 and 5 - Ecological Management Plan and Bat Management Plan Review

1.0 Introduction

This letter presents the findings from a review of the Bat Management Plan (BMP) for Gleeson Quarry, Huntly (Wildlands, February 2020) and Ecological Management Plan (EMP) for the Compensation Site at Gleeson Quarry, Huntly (Wildlands, February 2020) that was submitted to Waikato Regional Council (WRC) in support of resource consent applications for Fill Site 2, 3, 4 and 5 at Gleeson Quarry, River View Road, Huntly. The objective of this review is to ascertain whether the desired ecological outcome can be achieved by the applicant (Gleeson Quarries Huntly Ltd and Gleeson Managed Fill Ltd) and whether the level of detail provided is sufficient to enable WRC to implement robust ecological consent conditions.

2.0 Bat Management Plan

I have reviewed the BMP and am comfortable that adequate measures have been put in place to manage risks to bats and their roosts and to compensate for the loss of potential roost trees. This will be achieved through the implementation of measures within the BMP including a tree removal protocol, replacement of potential roosts through artificial bat roosts and chainsaw hollows, along with the provision of a protected (in perpetuity) bat reserve. It is recommended that conditions of consent include a report to confirm the number of potential roost trees removed and how many artificial roosts and chainsaw hollows were installed along with the protection in perpetuity of the bat reserve (minimum area of 1.5 ha).

3.0 Ecological Management Plan

I have reviewed the EMP and have the following comments:

- The EcIA (Boffa Miskell, 2019) identified 1,530m^2 wetland habitat to be lost due to the location of the fill sites and a ratio of 1 (loss):1 (creation) as mitigation for this loss.
- Wetland buffering is proposed in the EMP of around 1,757m^2 of existing wetland habitat. The wetland is considered to be in a '*relatively good condition'*. This is put forward by Wildlands as a restoration ratio of 1.2:1 (gain:loss).
- The previous review (letter from Lyndsey Smith (AECOM) dated 22nd January 2020), of the Wildlands (2019) Gleeson Huntly Offset Location Assessment stated that '*..the level of information submitted is insufficient to determine whether the desired ecological outcome will be achieved by the applicant*.' And '…*The documentation indicates where mitigation will be delivered but lacks detail that would ensure that the ecological outcomes sought were delivered.'*
- In principle, compensating for the loss of a degraded wetland through improved buffering of another wetland or wetlands is appropriate if all other means have been exhausted (e.g. recreation of wetland habitat, or wetland revegetation) due to the absence of available offset or compensation sites. However, the accountancy for demonstrating this has not been provided within the EMP and is not sufficient to demonstrate that the no net loss of wetland habitat has been achieved. I disagree with the applicants ascertain that a 1.2:1 ratio (gain:loss) has been met with the current scenario proposed in the EMP.
- The degree to which a wetland buffer compensation would adequately address effects from fill sites 2, 3, 4 and 5 is dependent on:

- Demonstrating that buffering will prevent the loss or degradation of the existing wetland habitat and its biodiversity values, where there is a clearly demonstrated threat of the loss or decline in the system's condition. This is largely based on:
    - How much the biodiversity values within the existing compensation wetland(s) are currently affected by surrounding landuse or disturbance and correspondingly, how much the biodiversity values within the compensation wetlands would benefit from buffering (e.g. high benefits if the buffering prevents the effects of livestock but less so if livestock are already excluded from the wetland);
    - The quantum of buffering;
- The time it would take to achieve the benefit (temporal lag); and
- The likelihood of success.

- Given the above, I would like to request further information from the applicant to demonstrate the adequacy of wetland compensation. This might include the use of a compensation model as a supporting tool as part of which consideration of other compensation options may include (but are not limited to):
    - Establishment based compensation: which involves the development (i.e. creation) of a new wetland system based on the ecological feature of the compromised wetland/s;
    - Rehabilitation/restoration compensation: which involves the rehabilitation/restoration of similar degraded wetland system in order to repair or improve wetland integrity and associated ecosystem services.

Yours faithfully

Fiona Davies
Associate Director - Environment/Team Leader - Natural Resources
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From: Emma Cowan
To: Kate Madsen
Cc: Smith, Lyndsey; Jamie MacKay
Subject: FW: Gleeson Quarry wetland compensation
Date: Tuesday, 28 April 2020 2:00:21 PM
Attachments: image003.png
image286076.png

Hi Kate

Please see the advice on wetland compensation in the email below. The EMP will need updating to reflect the changes to the compensation package.

It is unclear to me whether the compensation package/ecological enhancement programme is limited to compensating adverse effects such as loss of wetlands and loss of habitat, or whether the enhancement programme goes above and beyond compensation and achieves a net benefit to the Waikato River catchment. Additionally whether the ecology assessment addresses potential changes to stormwater quality discharges over the life of the project.

Can further explanation please be given to demonstrate how the proposal will achieve a net benefit to the Waikato River as required under the Vision and Strategy.

Kind regards

Emma Cowan | RESOURCE OFFICER | Land Development, Resource Use
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To ensure we are doing everything we can to slow down the impact of COVID-19, our offices are currently closed and our staff are working remotely. If you need health advice or information, call Healthline on 0800 358 5453 or head to covid19.govt.nz.

From: Davies, Fiona <fiona.davies@aecom.com>
Sent: Thursday, 16 April 2020 9:06 pm
To: Emma Cowan <Emma.Cowan@waikatoregion.govt.nz>
Cc: kdrew@bbo.co.nz
Subject: FW: Gleeson Quarry wetland compensation

Hi Emma,

I have reviewed the additional information sent through by the applicant. The compensation package being proposed for the reclamation of 0.15ha of low value wetlands includes a combination of averted

loss and rehabilitation from:

- 0.51ha of wetland restoration planting and pest plant control to wetlands of varying degrees of ecological value within the CA4 restoration area.
- 0.33ha of buffer planting to degraded wetlands to the north of the CA4 restoration area.
- Stream headwaters restoration planting and pest plant control (area not specified).

Compensation accounting has not been provided by the applicants ecologists which details the ecological values of wetlands lost (this is additional to % indigenous vegetation and should include hydrological, physico-chemical etc functions of the wetland) and the corresponding ecological values/functions at wetland restoration sites (actual and potential) to demonstrate an appropriate compensation package. This is a preferred method to demonstrate no net loss of wetland value has been achieved. Nonetheless, on balance, from information provided by the applicants ecologist I would consider the compensation package of wetland, stream and terrestrial restoration to provide adequate mitigation for the wetland reclamation resulting from the site development. Given the addition of further restoration of areas to the original Ecological Management Plan provided, I would recommend that the Plan is updated to include the full and final restoration package.

A final recommendation and/or assumption would be that the indirect effects from the loss of wetland function (i.e. effects on downstream habitats relating to attenuation and treatment of water) at the development site, on downstream ecological values is assessed and then addressed through the stormwater design.

Please don't hesitate to contact me if you would like to discuss in further detail.

Cheers

Fiona

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From: Jamie MacKay <Jamie.MacKay@wildlands.co.nz>
Sent: Thursday, 2 April 2020 2:15 PM
To: Davies, Fiona <fiona.davies@aecom.com>
Cc: Kathryn Drew <kdrew@bbo.co.nz>; Emma Cowan <Emma.Cowan@waikatoregion.govt.nz>; Nick Goldwater <Nick.Goldwater@wildlands.co.nz>; 'Kate Madsen' <kate@pauaplanning.co.nz>
Subject: [EXTERNAL] RE: Gleeson Quarry wetland compensation

Hi Fiona,

Thanks for your further comments. I asked Nick Goldwater to review the reports, your S92

request and subsequent comments, and the mitigation package. As a recap, the mitigation package we are offering for the loss of 0.15 hectares of wetland classed as having "Low" ecological value by Boffa Miskell Ltd in the AEE for the quarry is:

- Pest plant control and enrichment planting of 0.23 ha of *Carex* and *Eleocharis* sedgeland
- Pest plant control and planting in approximately 0.28 ha of degraded exotic wetland vegetation to create WF8 – kahikatea-pukatea swamp forest
- Planting of approximately 0.07 ha of appropriate indigenous vegetation to provide a 10 metre buffer to the *Carex* and *Eleocharis* sedgeland
- Planting of approximately 0.26 ha appropriate indigenous vegetation to provide a 10 metre buffer to the degraded wetland
- Pest plant control and riparian planting upstream of the wetland to provide at least a 10 metre buffer on both sides of the watercourses that feed the wetland complex, including an extension to the restoration area shown in the EMP to protect the headwaters of the western arm of the gully system

This wetland mitigation package will result in the restoration of 0.51 ha of wetland with 0.33 ha of wetland buffer planting. The total gully restoration area is 3.75 ha and I have attached a plan showing the proposed restoration areas and buffers.

Nick's comments are below:

In our opinion there is a greater certainty of positive ecological outcomes being attained by restoring existing degraded wetlands close to the impact site as opposed to creating new wetlands. There are inherent challenges with creating new wetlands in terms of soil types and hydrology. It is also noted that the topography of the site means that potential areas for wetland creation are already occupied by wetland vegetation and/or swamp forest species, e.g. gully floors. As such, we are proposing to restore up to 0.51 ha of degraded wetland habitat, with the addition of 0.61 ha of buffer planting.

Notwithstanding the rarity of wetlands (i.e. c.10% of original extent remaining in NZ), we acknowledge that the impact wetlands have values and functions that will be lost as a result of the proposed works. Ecological values include the potential to support indigenous plant, fish and waterfowl species, while wetland functions include the filtration of ground and surface water flowing through the catchment and attenuation of flows/floodwaters during heavy rain events.

The two wetlands earmarked for restoration occur in the same gully system, and are thus have hydrological linkages despite the presence of a bund at the downstream end of the CA4 restoration area. The CA4 wetland extension is dominated by exotic species such as Mercer grass and localised grey willow, and it is the intention to restore this area to a swamp forest gully system (i.e. WF8 – Kahikatea, pukatea forest). Pukatea and kahikatea are currently present in the CA4 restoration area and this habitat could be extended downstream along the gully floor, thereby creating a contiguous linkage with the gully system to the west. As long as the appropriate maintenance is implemented, the ecological values of the restored sites will be high in terms of floristic and structural diversity. In the medium to long-term, a swamp forest habitat would also provide more habitat for a range of indigenous fauna and flora species. We acknowledge that the proposed habitat for restoration and the existing impact wetlands are not 'like-for-like', but it is recognised that the impact wetlands may potentially have supported typical swamp forest species in pre-human times.

It is likely that the existing wetland areas proposed for restoration provide functions such as flood attenuation, sediment trapping and the uptake of nutrients (N and P), and, to a lesser degree, carbon storage. These functions, however, are being adversely impacted by stock and a lack of buffering. The proposed restoration approach will involve the planting of indigenous sedges together with woody species typically found in swamp forest habitats. A higher density and abundance of wetland vegetation, together with a planted terrestrial buffer, will markedly improve flood attenuation, sediment and contaminant removal, and protect against. This will improve the quality of water flowing into

downstream receiving environments, although it is acknowledged that such environments may currently be adversely impacted by agricultural activities. Wetlands are recognised as important carbon sinks, particularly those with peat soils. The potential for the restored wetlands to sequester carbon will increase as the new plantings establish and grow, mainly for long-lived woody species such as kahikatea, swamp maire and pukatea.

In summary, we consider that there is definite scope for improvement with this approach and that a net gain in ecological values will be achieved by restoring a buffered, gully system that includes terrestrial, freshwater, and swamp forest elements.

Does this explanation cover all your points? We to discuss this in a virtual meeting if that helps.

Cheers,

Jamie

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Providing outstanding ecological services to sustain and improve our environments

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From: Davies, Fiona <fiona.davies@aecom.com>
Sent: Friday, 27 March 2020 1:47 PM
To: Jamie MacKay <Jamie.MacKay@wildlands.co.nz>
Cc: Kathryn Drew <kdrew@bbo.co.nz>; Emma Cowan <Emma.Cowan@waikatoregion.govt.nz>
Subject: RE: Gleeson Quarry wetland compensation

Hi Jamie,

My response below to your email. In summary you still need to address the following:

1. Clear demonstration of investigations undertaken to locate an area for wetland creation?
2. What are the wetland value/functions that well be lost?;
3. How do these functions compare the value/functions of the wetland/s in the area earmarked for restoration?;
4. If they are similar, is there scope to improve the existing wetland functions earmarked for restoration (restoration/rehabilitation gain) to such an extent that the functional gain will offset what was lost?
5. If they are similar but there is no scope for improvement, is there a demonstratable risk of losing these wetland functions, in the short to midterm?

6. Will the approach proposed prevent this loss?

It is possible that this may be the case under the existing approach, but it is not demonstrated.

Happy to set up a Teams meeting chat if that would help?

Cheers,

Fiona

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From: Jamie MacKay <Jamie.MacKay@wildlands.co.nz>
Sent: Monday, 23 March 2020 12:14 PM
To: Davies, Fiona <fiona.davies@aecom.com>
Cc: 'Kate Madsen' <kate@pauaplanning.co.nz>
Subject: Gleeson Quarry wetland compensation

Hi Fiona,

Thank you for your comments on the Gleeson Quarry EMP and BMP. I have undertaken some calculations to attempt to quantify the wetland compensation being offered and I wanted to run them past you before updating the report. There are no appropriate locations nearby to recreate wetland habitat so we are still proposing to restore and improve existing habitat. [I'd like to understand in a bit more detail what these investigations have entailed]

I have used the Boffa report and my observations on site to conservatively quantify the loss of indigenous wetland vegetation [the value of the wetland extends beyond its vegetation or direct habitat- more on this below] at the impact sites. All the wetlands are degraded but they do all have an indigenous component with FA4 having the highest proportion of indigenous vegetation in the wetland fringing the pond.

Location	Area (ha)	Estimated native	Native loss (ha)
FA2	0.05	0.5	0.03
FA3	0.07	0.5	0.04
FA4	0.04	0.7	0.03
Total	**0.15**		**0.09**

I then used the wetland management units in our EMP to calculate the amount of indigenous wetland vegetation currently present in the compensation area, and to estimate the amount of indigenous wetland vegetation that could be gained through removal of pest plants. For these calculation I have assumed the maximum proportion of indigenous wetland vegetation that is achievable is 90%.

Management Unit	Area (ha)	Estimated native [I guess this is this a %?]	Native gain through restoration to 90% (ha)
MU2	0.06	0.65	0.01
MU4	0.12	0.8	0.01
		Total	**0.02**

These calculations indicate that our original proposal would result in the loss of 0.07 ha of indigenous wetland vegetation [focus on vegetation loss rather than wetland ecosystem. Calculations do not take into account the ecological value and functions of the 'impacted' and 'compensation' sites and how this effects the ratio needed to achieve no net loss]. Our proposal was to address this shortfall through the protection and restoration of the headwaters of the stream and wetland complex through fencing, pest plant control and planting [compensation rather than offset. Further wetland restoration offset locations need to be investigated and reported upon before this option used]. The total area of habitat to be restored is 2.98 ha. The area is currently unfenced and stock have access to the stream and wetland. The wetland is dominated by non-palatable species which suggests that stock are impacting the wetland and there is little to no indigenous regeneration within the buffer. Preventing stock access to the buffer, the stream, and the wetland together with planting will reduce runoff into the system and allow palatable species to regenerate naturally. The gully has been identified as an SNA and I considered that this holistic approach would provide appropriate compensation for the loss of degraded wetlands produced by human activity at the impact site (From preluding statements it sounds like 'averted loss' offset may be the reasonable approach. In which case the residual integrity of the wetland functions (of the area that will be restored) needs to be assessed and the risks of losing these functions due to existing land uses require assessing. From memory, the report stated that the wetlands in the proposed restoration area were in a good state- so obviously not impacted by the current landuse?. However, quantifying these benefits will be time consuming and the client is keen to progress this consent as quickly as possible so we are proposing to extend the compensation area to encompass degraded wetland downstream of the pond: Acknowledged, however there is not enough information been provided to determine if the approach demonstrates no net loss.

The area enclosed within the polygon shown above is approximately 3,000 m2 and a 10 metre buffer will be provided [its not clear to me if you are talking about a second additional site]. The exact dimensions of the additional area will be determined following a site visit to identify feasible fence locations and wetland extent. The attached image shows the existing vegetation and it is very clear that the vegetation is dominated by exotic species with a very minimal indigenous component. If we conservatively assume that 30% of the vegetation is indigenous, restoring the wetland to 90% indigenous vegetation will provide up to an additional 0.18 ha of indigenous wetland vegetation. This, combined with the 0.03 ha increase in indigenous wetland vegetation that will be gained through restoration of the wetland upstream of the pond, gives a total increase in indigenous wetland vegetation of 0.21 ha [Calculations do not take into account the ecological value/function of the 'impacted' and 'compensation' sites and how this effects the ratio needed to achieve no net loss. The approach relies on wetland vegetation(or the biodiversity function of the wetland), and it is possible that your approach may offset for the loss of this function. However, and more importantly, what about other wetland functions such as flood attenuation, streamflow regulation, sediment trapping, phosphate assimilation, nitrate assimilation, toxicant removal, erosion control, carbon storage etc.) The baseline report doesn't outline these functions, which differs substantially between wetland types, and it is not known if the offset will compensate for these functions]. Is this an appropriate restoration ratio?

Responding to your other comments:

1. "The quantum of buffering"
    - The buffer to be restored is a minimum of 10 metres width, and up to 20 metres width (from the wetland or stream edge to the upslope extent of the plantings). [I think you have misunderstood this request. 'Quantum of buffering' refers to the amount of buffering (overall) needed to offset the loss of wetland habitat taking into account quality of impacted and restored wetlands]
2. "The time it will take to achieve the benefit (temporal lag)"

- Excluding stock will immediately reduce physical damage to the wetland, and direct nutrient input from stock and runoff. The wetland is expected to rapidly improve in condition within the first 3-5 years of fencing and restoration works, and will be in very good condition by 10 years. The benefits of pest plant control and planting in the adjacent buffer habitats will take longer. The buffer will have good riparian protection functions within five years of stock exclusion and planting, and will achieve canopy closure over a similar timeframe. The terrestrial habitats will provide functioning forest and shrubland habitats for indigenous fauna by 10 years post establishment.

3. "The likelihood of success"
    - With appropriate management, both wetland and terrestrial habitats at the site will be successfully restored by the methods proposed. Monitoring will be required to ensure appropriate and regular maintenance is undertaken during the establishment phase (and interventions such as supplementary plantings and or additional pest control if required). A suitable and achievable performance measure for both wetland habitats and the terrestrial buffer is 80% cover with indigenous species by the end of five years of management.

Please let me know if you require any more information, I'm in my home office all week if a phone call is easier.

Kind regards,

Jamie

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