

## Memorandum

To	Andrew Bashford	Page	1
CC			
Subject	Air Quality Addendum Review of proposed AFFCO air discharge consent application		
From	Andrew Curtis		
File/Ref No.	01	Date	2 Nov-2016

Horizons Regional Council (HRC) commissioned AECOM New Zealand Limited (AECOM) to review the air discharge aspects of the proposed air discharge consent Application. Subsequent to providing advice on the Application AECOM has been asked to comment on the conditions contained in the air discharge consent that has been proposed by the Applicant contained in the Section 42A report prepared by Tabitha Manderson of Opus International Consultants Limited (Opus) on behalf of HRC.

### 1.0 Initial Review

AECOM undertook an initial review of the Application in early 2015, and provided some air quality related questions to HRC which were included in the 29 April 2015 email sent to the Applicant by Jasmine Mitchell.

Specifically the questions asked were as follows:

- There seems to be no assessment of the application in terms of the air discharge. There is no assessment of the application of pond solids and paunch material in terms of the state of the material, where it will be placed and if there are any effects associated with this?
- Do you have any information on the existing travelling irrigator to determine the effects?
- Do you have an irrigation plan for the fixed irrigators in some areas? It would be useful to know the height above ground to determine whether there will be any spray drift.
- There is no assessment of the odour aspect other than saying it will not occur.
- In order to ensure the irrigated wastewater doesn't become odorous, it may be that the DO level within the outlet needs to be managed, however there is no indication of how low the DO gets and what is done to correct it?
- Has there been any thought into odour monitoring around the edges of the irrigation area?
- There is some concern around the LMU2 area and the proximity to the residential properties and that some further controls may be needed in this area to manage the effects.

### 2.0 Review of Section 92 Responses

The Applicant responded to these queries in 29<sup>th</sup> May 2015, a copy of which is included as Attachment A to the Section 42A Report. The responses, while answering the questions, did not provide specific information to resolve some of the concerns set out above.

In addition, the Applicant prepared two documents (Annex's 19 and 22) which contained more detailed assessments of air discharge and odour effects.

These documents, Annex 19 Air Discharge Assessment of Effects, and the Annex 22 Odour Assessment contain some additional information which is useful in assessing the potential for off-site effects from the various activities proposed. Of note are three matters which are discussed below.

## Application of Wastewater

In Section 3.1.1 of Annex 22, the Applicant has indicated that wastewater irrigation could occur for up to 24 hours a day. AECOM has concerns about this as low odour dispersion conditions often occur during night time hours, and therefore there is potential that irrigation at these times, closer to residential areas could increase the risk of off-site odour effects.

The Applicant highlighted a meeting held with neighbours, reported in Section 13.3 of the Application, where it was indicated that neighbours did not have a problem with the odour. It is accepted that this is a fair representation of the meeting that was held. However as there is no information provided on who the neighbours were who attended the meeting, and whether they were from rural properties or urban areas across the Oroua River, or whether the irrigation was occurring following a period with the system shut down it is not possible to know how representative the feedback was in regards to general concerns about odour from this activity.

Based on our experience it is likely that the irrigation of well aerated wastewater has a low potential for generating odour. However in our experience this material can become anaerobic relatively quickly and therefore AECOM does not consider it is possible to be definitive that the odour may not be offensive off-site on occasions.

AECOM also consider that the “mildly meaty” descriptor used does not adequately represent the odours that its staff have detected around other similar activities, which are better characterised as wastewater odour.

## Application of Paunch Material

In terms of this material AECOM considers that as long as the material is well composted before it is spread the odour potential is significantly reduced over that which can be experienced from fresh paunch grass, which is considered highly odorous. However even with the reduced odour levels from the composted paunch, exposure for up to two days at a time (albeit for only seven days according to Section 3.2.3) of something whose odour (Section 3.2.4) is described as follows: *“With short exposure the odour is not entirely unpleasant, although protracted exposure could see its attraction wearing rather thin.”* is likely to result in some odour if not appropriately managed.

## Application of Pond Solids

AECOMs concerns in regard to the application of pond solids are essentially the same as for the Paunch material. The application of well composted material will have a lower potential for odour than material straight out of the ponds, but the presence of the material on the land for up to two days could give rise to odour nuisance on occasions.

## 3.0 Conclusion

While AECOM still has reservations about the information provided with the Application in terms of whether it fully assesses the potential for effects from discharges to air, we are of the opinion that there are a variety of mitigation measures which can be implemented to minimise the potential for off-site effects.

The Applicant has addressed some of these in the Application and the Section 92 response, with others covered by consent conditions.

## 4.0 Matters raised in Submissions

In terms of submissions the majority of those that opposed the discharge to air application are concerned primarily with the length of term sought for the consent, there were no specific air quality issues raised. AECOM have reviewed the Section 42a report and consider the report addresses the issue of length of term adequately.

## 5.0 Proposed Consent Conditions

AECOM has reviewed the wording of the conditions in the proposed discharge to air consent attached to the Section 42A Report. In general the conditions proposed are considered adequate, however there are a number of additional conditions that are also considered necessary to deal with the issues raised above, and a couple of changes suggested to the conditions proposed by the Officer. These

additional conditions are consistent with those granted for the Fielding Wastewater Treatment plant and are set out below:

## Odour and Aerosol Management

### Condition 5:

AECOM considers that the condition as drafted lacks certainty with respect to the wind speed trigger as no height is specified, and the calculation of wind speeds at heights different to that measured can be difficult. In any event if the weather station is installed in accordance with Condition 7, as modified below, the measurement height will either be 6 or 10 m above the ground. AECOM also has concerns that 12 m/s is too high a trigger, but considers that Condition 6 is appropriate to deal this concern.

AECOM's suggestion is as follows:

*The Permit Holder must ensure the activity automatically ceases when the 10 minute average wind speed ~~at the maximum height of the sprayed treated wastewater exceeds 12 m/s or higher from a~~ direction whereby **irrigation is occurring upwind of and the irrigation is within 200 m of the property boundary.** The activity can resume 30 minutes after the wind speed drops below the nominated threshold or the wind direction changes **such that irrigation is no longer upwind or and within 200 m of the property boundary.***

### New Condition:

AECOM is concerned that there is a high potential for wastewater to become anaerobic if it is left in the irrigation pipes for periods of time, and disagrees with the Applicant that a short term discharge of odour associated with this is either appropriate or acceptable. Therefore we have proposed a condition to deal with this.

*In the event that irrigation will not occur for more than 10 days in a particular section of the irrigation system, then the Consent Holder must flush that section with clean water. In the event that the entire irrigation system is to be shut for more than 10 days then the entire system shall be flushed with clean water.*

### New Condition:

AECOM is concerned that the application of both pond solids and paunch materials to land has a high potential to result in odour effects. Based on our understanding of how this activity is undertaken at other sites it is considered that best practice involves ploughing or tilling the material into the soil as quickly as possible. A condition in this regard is therefore proposed for this site.

*The Consent Holder must ensure that any pond solids or paunch material that is applied onto the land must be worked into the soil within two hours of application.*

## Monitoring

### New Condition:

While the Applicant indicates that the wastewater is well aerated, which is supported by the data provided in Table 4.2 of the Discharge Conceptual Design included with the Application, AECOM considers that it is appropriate to have a condition which stipulates a minimum Dissolved Oxygen value, below which irrigation will not occur. This is considered necessary as while the report provides summertime mean and median, and maximum Dissolved Oxygen values (with the average and median both are both 3 g/m<sup>3</sup>) no standard deviations or minimum values are provided. Therefore AECOM cannot be sure that wastewater in the irrigation pipes will not become anaerobic if it sits in the irrigation pipes for periods of time. Measuring Dissolved Oxygen is also consistent with the condition proposed above to flush out the lines out.

*The Consent Holder shall not irrigate treated wastewater that has a Dissolved Oxygen concentration of less than 2 g/m<sup>3</sup>.*

### New Condition:

AECOM considers that there should be a condition that requires the Consent Holder to proactively assess the potential for off-site odour effects. This is consistent with the conditions granted to other

similar activities, and consistent with the requirement of proposed condition 6 to review the adequacy of the irrigation system.

*The consent holder shall undertake monthly odour monitoring around the perimeter of the site during the months of wastewater irrigation. This monitoring must occur when the wastewater is being irrigated and shall record whether any odour is discernible or not at each location. The monitoring shall be undertaken using the German VDI standard 3490 or similar and the 0 to 6 intensity scale. The outcome of each monthly odour monitoring shall be recorded. The consent holder shall investigate the cause of any significant odour detected during each monthly monitoring, and shall remedy any faults located. A record of each monthly odour monitoring and any remediation carried out shall be reported to the Horizon Regional Council Regulatory Manager by the end of each month. After two years the consent holder may apply to the Horizon Regional Council Regulatory Manager to reduce the frequency of the monitoring and may do so with written confirmation from the Horizon Regional.*

## **6.0 Closure**

If you have any questions on any of the matters raised above then please contact the undersigned.

Andrew Curtis  
Technical Director Air Quality  
andrew.curtis@aecom.com

Mobile: +64 29 355 1390  
Direct Dial: +64 9 967 9126