

Te Awa Lakes Air Quality Technical Assessment

Prepared for Perry Group Limited

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PATTLE DELAMORE PARTNERS LTD

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1.0 Introduction

- 1.1 Perry Group Limited ("PGL") requests a private plan change to enable the development of their landholding in the north of Hamilton city. PGL seek to establish a tourism and recreational destination for the region, supported by new residential and business uses. Their landholding is currently zoned for industrial use within the (Partially Operative) Hamilton City Council District Plan ("HCDP").
- 1.2 This plan change relates to approximately 62 hectares of land bound by the Waikato Expressway to the west, the Waikato River to the north and east, and Hutchinson Road to the south. The site is a former sand quarry which has been in the process of disestablishing since May 2016 and is held in its entirety by PGL.
- 1.3 In September 2016, PGL engaged a team of experts to undertake a masterplanning exercise for their landholding; the purpose of which was to explore options consistent with the overall vision including an adventure park, tourism precinct, mixed use precinct and a supporting residential community structured around a series of high amenity water bodies.
- 1.4 Through the masterplanning exercise, the "Consultant Team" formed of Bloxam, Burnett & Olliver (planning and civil engineers), Boffa Miskell (masterplanners, urban designers and landscape architects), Traffic Design Group (traffic engineers), CKL (stormwater engineers), CMW Geosciences (geotechnical engineers), Marshall Day (acoustic engineers), Coffey Services (environmental site investigations), Kessels Ecology (ecology), Dr Caroline Phillips (archaeology), and RCG (economics), have developed and tested a range of preliminary masterplan options. Distilling from these options a series of planning maps for the site which are to be inserted into the HCDP and enable development of the site accordingly.
- 1.5 This report sets out the Air Quality Technical Assessment for the Te Awa Lakes Plan Change Area. It is one of a suite of technical reports that has been prepared to inform and support the preparation of the structure plan and request for the Te Awa Lakes Plan Change.

Scope of Works

- 1.6 Perry Group Ltd (Perry Group) has engaged Pattle Delamore Partners to review the potential reverse sensitivity issues associated with odour discharges from the Fonterra dairy factory and AFFCO meat processing plant at Horotiu on the Te Awa Lakes development.
- 1.7 To determine if there is likely to be a reverse sensitivity issue concerning potential odour discharges from the Fonterra Dairy Factory and AFFCO meat processing plant at Horotiu, PDP undertook the following tasks:
 - Reviewed the recent (2016) Fonterra Te Rapa consenting resource consent application and assessment of environmental effects to determine the predicted extent of odour discharges;
 - Reviewed Fonterra Te Rapa odour complaint records to identify the source, frequency and distance from the plant that odorous discharges were detected;
 - Reviewed AFFCO (2015) Horotiu processing plant assessment of environmental effects to determine the predicted extent of odour discharges;

- Reviewed records of the independent odour audit undertaken on the AFFCO Horotiu processing plant;
- Reviewed the Te Awa Lakes development proposal and determine the separation distance from odour emission sources identified in Tasks 1 to 4; and
- Reviewed the Emission Impossible document titled “Separation Distances for Industry”¹ prepared for Auckland Council and the guidance documents prepared for the Victoria² and South Australian³ EPA’s regarding separation distances.

2.0 Meteorological

- 2.1 The Ruakura monitoring station is the closet public meteorological station to the site and the data is likely to be representative of regional air flows in the area. The Fonterra Te Rapa dairy factory is to the south of the proposed Te Awa Lakes development and the AFFCO Horotiu meat processing plant is north of the proposed Te Awa Lakes development.
- 2.2 The Ruakura measurements indicate that the predominant wind directions for the area are from the west and south west with a secondary dominant wind direction from the north east. Sites to the east/north east and south west of either the Fonterra Te Rapa and AFFCO Horotiu sites are more likely to be downwind of any discharges from these industrial plants.
- 2.3 Sites to the north/north west or south east of these sites are likely to be downwind of any site discharges less than ~10% of the time.
- 2.4 Drainage flows along the Waikato River may result in some odours being detected along the river bank during calm days, but it is uncertain how often (if ever) odour discharges are occurring when conditions are suitable for such drainage flows.

¹ “Separation Distances for Industry”, A discussion document prepared for Auckland Council, July 2012, Wickham, L, Prepared by Emission Impossible Ltd

² “Recommended separation distances for industrial residual air emissions”, Publication number 1518, EPA Victoria

³ “Evaluation distances for effective air quality and noise management”, EPA South Australia, 2016

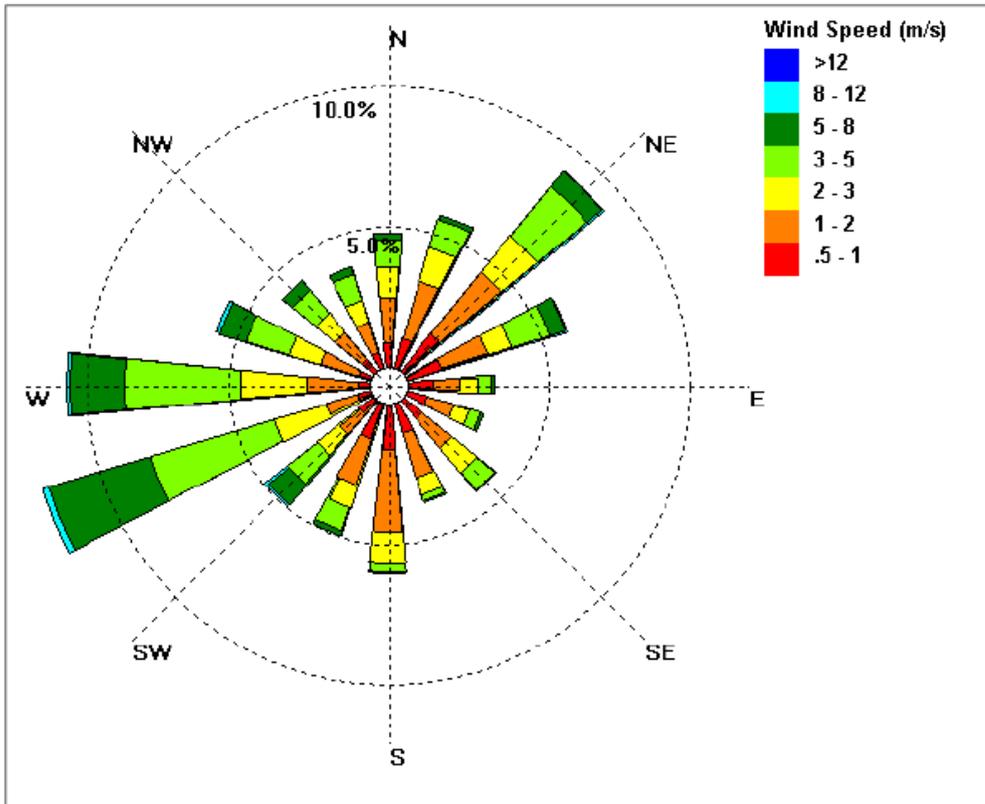


Figure 1: Ruakura meteorological station wind rose 2006-2011.⁴

3.0 Fonterra Te Rapa

- 3.1 Fonterra Ltd operates a dairy manufacturing site on Te Rapa Road which manufactures a range of dairy products including milk fat (butter) products, skim milk and whole milk powders. The boundary of the Fonterra site is approximately 330 m south/south east of Hutchinson Road which is the southern boundary of the Te Awa Lakes development. The potential sources of odour (milk dryers, co-generation plant and wastewater treatment plant) are located more than 550 m from Hutchinson Road.
- 3.2 The primary odour emission sources are from the storage, conveyance and treatment of wastewater from the manufacturing processes and dairy liquids received from other Fonterra manufacturing sites. The Te Rapa reconsenting AEE⁵ states that odour may be generated to a lesser degree from milk drying activities. A review of the odour complaint history of the site indicated that odour complaints are all related to the wastewater treatment plant. In the recent decision regarding Open Country Dairy Limited⁶, the independent commissioner found that the risk of adverse odour discharges to air from the boilers and milk drying plant beyond

⁴ Fonterra Te Rapa: Air Quality impact Assessment, Beca, 2016, p 22

⁵ Te Rapa Reconsenting, Mitchell Daysh, 2016

⁶ Hearing decision, Consent application 135257, Waikato Regional Council, Open Country Dairy Limited Waharoa Resource Consent, Kevin Mahon, 17 May 2017

the boundary of the site is likely to be low provided effective operation, maintenance and cleaning are in place.

- 3.3 As part of the Te Rapa reconsenting AEE, Beca Ltd (Beca) undertook an inventory of odour sources from the wastewater treatment plant. This review found that retention times of wastewater in the WWTP was a significant contributor to odour events. Beca recommended that if mitigation measures were put in place to limit retention times to less than two days, then this would prevent most odour complaints.

Review of Odour Complaints

- 3.4 The odour complaint history for the Te Rapa dairy factory is shown below in **Figure 2**.

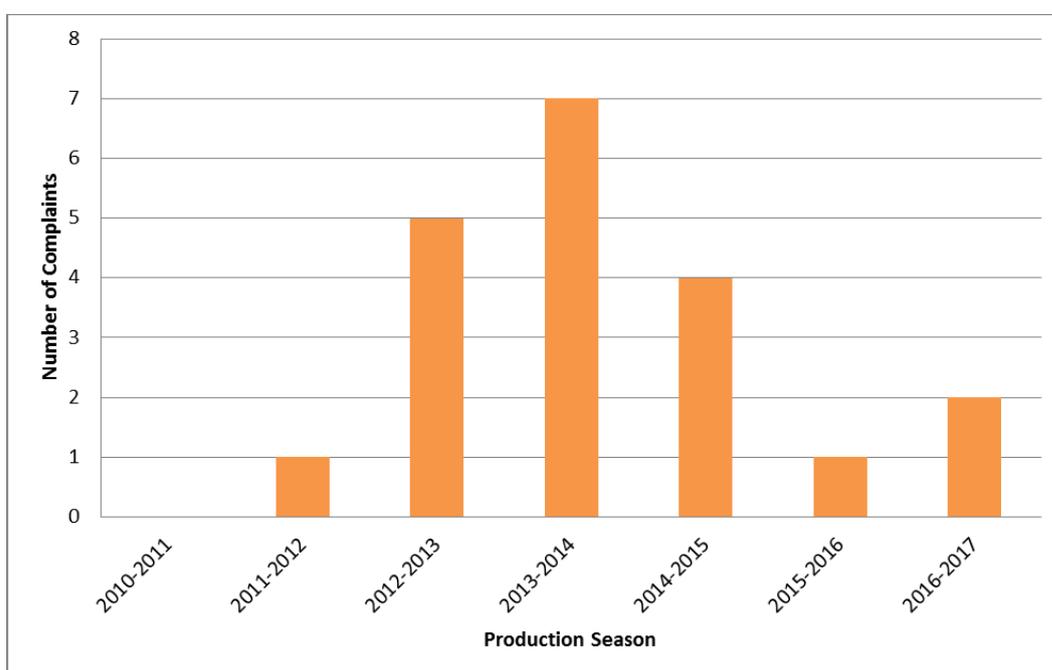


Figure 2: Fonterra Te Rapa odour complaints

- 3.5 The wastewater treatment plant was upgraded in 2015 and it can be seen from **Figure 2** that this has resulted in a reduction in odour complaints.
- 3.6 The location of odour complaints for the period 2012-2015 is shown below in **Figure 3**.
- 3.7 It can be seen from **Figure 3** that most odour complaints have been received from residents living to the east of the site (across the river and downwind of one of the prevailing wind directions) or from one house close to the site boundary (approximately 50 m away). As noted above all of these complaints were related to the operation of the wastewater treatment plant which was upgraded in 2015.
- 3.8 The majority of the complaints are restricted to residents within 500 m of the wastewater treatment plant.
- 3.9 There were no complaints received from any residents close to the southern boundary of Te Awa Lakes development at Hutchinson Road.



Figure 3: Odour complaint locations 2012 - 2015⁷

4.0 AFFCO Horotiu

- 4.1 The AFFCO Horotiu meat processing plant is located over 1,800 m to the northwest of the proposed Te Awa Lakes development site. The AFFCO Horotiu processing plant includes a beef slaughter and processing plant as well as a rendering plant which processes protein meal and tallow for export and local markets.
- 4.2 Significant odour sources include:
- Raw material bins;
 - Cookers;
 - Meal and blood dyers;
 - Meal bins;
 - Wastewater treatment plant anaerobic treatment ponds;
 - Bio-filters;
 - Diffuse emissions from the factory; and
 - Paunch spreading processes.
- 4.3 Between 2010 and 2012, AFFCO implemented upgrades to the processing and water treatment plants including:

⁷ Fonterra Te Rapa: Air Quality impact Assessment, Beca, 2016, p 41

- Decommissioning the fellmongery pond;
- Commissioning new low emission contract dryers;
- Covering the anaerobic balance pond with a membrane and flaring the captured biogas;
- Increasing the mechanical aeration within the aerated pond;
- Commissioning a new bark bio-filter; and
- Windrowing the paunch before land application to minimise odour emission rate.

Review of Odour Complaints

- 4.4 From January 2005 to July 2015, 80 complaints were received regarding odour alleged to be from the AFFCO Horotiu processing site. Most of these complaints were received before 2010, and there have been significant changes in the management and operation of the plant since 2010. Between January 2010 and 1 July 2015 there have been only 11 complaints, mainly to the south of the rendering plant. Offensive odours have been noted up to 1,100 m from the site. The northern boundary of the Te Awa Lakes development is ~1,800 m to the south east of the nearest potential source of odour on the AFFCO Horotiu processing site.
- 4.5 An assessment of the sites management plan was undertaken by an independent assessor in February 2017 at the request of Environment Waikato. Instances of non-compliance with the site management plan, particularly around the handling of blood products, were noted. These non-compliance events have the potential to cause offensive odours to be detected beyond the boundary of the site.
- 4.6 A Waikato Regional Council site compliance report completed in April 2017 found some non-compliance issues concerning the air discharge consent including:
- Processing of blood products on the site. The resource consent requires that stabilised blood is processed within 36 hours of slaughter and the assessor found evidence that processing of the blood did not occur for some days later. The assessor concluded this had the potential to cause extremely offensive odours beyond the boundary of the site; and
 - Uncontrolled discharges from the blood dryer condensate into a site drain. These discharges are a potential source for off-site odours.
- 4.7 An independent assessment of odour at the site was made in June 2017 at the request of Environment Waikato. The assessor found that recent upgrades of rendering plant the extraction and containment system resulted in the capturing all odour emissions from the rendering plant.

5.0 Separation (Buffer) Distances

- 5.1 In their report evaluating separation distances for the industry, Emission Impossible Ltd recommends that a separation distance of approximately 500 m should exist between industrial areas and other sensitive land uses (such as residential land use). But they also note

that separation distances are indicative and may be adjusted having regard for site specific circumstances such as type and size of operation, compliant history, type of emission control technology employed, etc.

- 5.2 For commercial livestock processing industries involving animal slaughter, Emission Impossible recommends a buffer distance of 500 m and for rendering plants, a minimum separation distance of 1,000 m is recommended (based on the recommendation in the South Australian and Victorian EPA guidelines). The AFFCO Horotiu processing plant is over 1,800 m to the northwest of the Te Awa Lakes development and therefore would meet the requirements of these recommended buffer zones.
- 5.3 For dairy factories the recommend buffer distance is 100 m (based on the recommendations of the South Australian and Victorian EPA guidelines). However, the Fonterra dairy factory also has an associated wastewater treatment plant, and therefore a larger buffer zone is more appropriate. The South Australian EPA recommends that for a large milk processing plant a separation distance of 500 m be adopted between the plant and sensitive receptors.
- 5.4 The separation distances recommended above are consistent with the odour complaint histories for both factories. At Fonterra Te Rapa it is rare for odours to be detected more than 500 m from the site and the furthest that offensive odour has been reported from the AFFCO Horotiu processing plant is 1,100 m.
- 5.5 It should also be noted that there is already residential land use located to the south-south west of the AFFCO Horotiu plant on Park and Birdwood roads as well as Horotiu Bridge Rd which are closer to the AFFCO plant than the proposed Te Awa Lakes development.

6.0 Summary

- 6.1 In PDP's opinion, the Te Awa Lakes Development will not cause a reverse sensitivity issue for either the Fonterra Dairy factory or the AFFCO Horotiu meat processing plant for the following reasons:
 - The Te Awa Lakes Development is not located downwind of the predominant wind direction from either Fonterra Te Rapa or AFFCO Horotiu. Based upon the wind rose data obtained from the Ruakura meteorological monitoring station the Te Awa Lakes Development site will be downwind of these plants less than 10% of the time;
 - There is adequate separation distance between the proposed Te Awa Lakes development based on NZ and overseas recommended separation distance guidelines. This is supported by the odour complaint history for both sites. Increased separation distances reduce odour intensity and make it less likely that offensive odour will be detected.
 - Odour at Fonterra Te Rapa is generally well managed and odour complaints are relatively infrequent; and
 - The consents for both plants require that offensive odours are not emitted beyond the boundary of the site and both companies are actively managing their operations to comply with this requirement.

7.0 References

Beca (2016). "Fonterra Te Rapa: Air Quality impact Assessment"

Emission Impossible Ltd (2012). "Separation Distances for Industry", A discussion document prepared for Auckland Council, July 2012, Wickham, L

EPA South Australia (2016) "Evaluation distances for effective air quality and noise management"

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