



Tuakau Structure Plan

Assessment of Air Quality Effects and Separation Distances

Prepared for
Waikato District Council

Prepared by
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Exceptional thinking together

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Executive summary

This report sets out an assessment of air quality effects and separation distances to support the preparation of the Tuakau Structure Plan. The approach used in this report is to focus on separation distances related to amenity effects of dust and odour, rather than health effects or risk from use of hazardous substances. This approach is considered appropriate for the nature and scale of industrial activities in and around Tuakau.

Land use planning to maintain adequate separation distances for air quality amenity is important to:

- protect industrial activities from encroachment and reverse sensitivity effects; and
- minimise potential effects on sensitive activities from the legitimate operation of industrial activities.

The maintenance of adequate separation distances is not intended to be a substitute for good on-site controls to minimise air emissions from industrial sites and do not detract from resource consent conditions that require consent holders to manage effects beyond the boundary of their site. However, this approach recognises that even when industries adopt good pollution control technology and management measures, there may still be unintended emissions as a result of factors such as equipment failure, accidents or unusually adverse weather conditions.

Activities sensitive to air quality amenity effects include residential premises, child care centres, schools and informal outdoor recreation sites. Residential dwellings (and their immediate environs) are sensitive to amenity effects because people can spend a significant portion of the day at home and also because of the nature of activities being undertaken. However, the sensitivity of zones that provide for residential activities can differ based on population density. A zone that provides for a high density of residential activities is more sensitive to amenity effects than a zone that provides for a low residential density. For the Tuakau Structure Plan this is particularly important when considering areas for 'up zoning', for example from a Rural Residential to a Residential zone.

A number of industrial and infrastructure activities with the potential to discharge dust and/or odour have been identified in the Tuakau area. Appropriate separation distances have been identified for these existing facilities based on a review of relevant Australian State guidelines. The facilities and separation distances are shown in Figures 1 to 3 attached to this report. In broad terms, 'up zoning' of areas within the buffer areas defined by these separation distances should be avoided unless there are other significant benefits that outweigh air quality amenity considerations.

The Tuakau Structure Plan includes an Industrial zone around the existing Bollard Rd industrial area and a new greenfields area north of Whangarata Rd. Based on a review of published separation distances for the type of industrial activities currently located around Bollard Rd, a separation distance of 250m is recommended as a buffer around the Tuakau/Whangarata Industrial area. There is a variety of activities that would be appropriate to locate within this buffer. The characteristics of compatible activities are that they would not require a high level of air quality amenity and would also not have the potential to generate appreciable dust or odour emissions.

1 Introduction

Tonkin & Taylor Ltd has been engaged by Waikato District Council to prepare an assessment of air quality effects and separation distances to support the preparation of the Tuakau Structure Plan. This report has been prepared in accordance with our letter of engagement dated 5 May 2015. The purpose of this report is to:

- i Provide background information on the need for separation distances between industrial facilities and sensitive activities to avoid adverse effects of emissions to air, particularly amenity effects of dust and odour, and to avoid reverse sensitivity effects on existing industry;
- ii Summarise published guidance on separation distances between industrial activities and sensitive activities;
- iii Identify activities sensitive to amenity effects of dust and odour and discuss amenity expectations in different zones, particularly those that provide for residential activity. Identify activities that are compatible with being located in a buffer around industrial activities;
- iv Identify existing industrial activities in the Tuakau area with the potential for amenity effects, particularly those activities that require resource consent for discharges to air of dust and odour. Recommend appropriate separation distances for these identified industrial facilities to inform the potential re-zoning of land near these sites; and
- v Identify an appropriate separation distance (buffer area) for the Tuakau/Whangarata Industrial area base on existing activities within the zone.

2 Separation distances for heavy industrial activities

2.1 Need for appropriate separation

The establishment of buffer areas, which separate industrial activities from more sensitive activities, is a recognised land use planning tool. These buffer areas serve both to protect industrial activities from encroachment and reverse sensitivity effects as well as to minimise potential effects on sensitive activities from the legitimate operation of industrial activities. In this context sensitive activities include activities with an expectation of high amenity or where there is a high density of people, which increases both the potential for amenity effects and the potential impact in the event of an industrial incident.

The maintenance of adequate separation distances is not intended to be a substitute for good on-site controls to minimise effects of air emissions and do not detract from resource consent conditions that require consent holders to manage effects beyond the boundary of their site. However, this approach recognises that even when industries adopt good pollution control technology and management measures, there may still be unintended emissions as a result of factors such as equipment failure, accidents or unusually adverse weather conditions.

In an existing developed area, it is likely that there will be pre-existing conflicts between incompatible land uses arising from historic development. The main purpose of considering recommended separation distances in relation to the Tuakau Structure Plan is to inform decisions about changing the sensitivity of an area, for example re-zoning an area from Rural to Rural Residential, or from Rural Residential to Residential. However, when considering re-zoning it is also important to differentiate between an actual change in the sensitivity of an area and a hypothetical change, for example where the existing land use patterns do not reflect the current zoning.

2.2 Approaches to determining appropriate separation distances

There are two main approaches that are used overseas to identify appropriate separation distances between industrial activities and sensitive activities; those based on amenity effects and those based on risk to human health in the event of an accident.

Amenity-based separation distances

Separation distances can be based on avoiding impacts on amenity values from "residual" emissions from industrial activities. The amenity effects considered are generally odour and dust, but may also include noise and vibration. As discussed in the previous sub-section, these separation distances do not replace the need for good on-site controls of dust and odour. They are intended to minimise the risk of amenity effects in the event of equipment failure or adverse weather conditions, etc. Guidance has been developed in a number of Australian States for amenity-based separation distances.

Human health risk-based separation distances

Separation distances can be based on protecting human health in the event of an industrial accident resulting in a fire or explosion and/or a significant accidental release to the environment. Separation distances are typically based on a site-specific risk assessment that considers the particular processes and substances used at a facility. This approach is required in Europe through the Seveso Directives, which requires Member States to "*take account in the land use policies of the need to maintain appropriate safety distances between establishments covered by this Directive and residential areas, buildings and areas of public use, recreational areas, and, as far as possible, major transport routes*".

The Seveso Directives relates to major chemical manufacturing facilities that store significant quantities of specific hazardous substances. The volume of hazardous substances that trigger the requirements under the Seveso II and III Directives are well above the volumes likely to be stored or used at the industrial activities in Tuakau. Also, because of the level of site-specific detail required, a risk-based approach is not considered appropriate for developing a recommended separation distance between sensitive activities and an Industry zone that may contain a variety of activities.

For the reasons set out above, the approach used in this report is to focus on separation distances related to amenity effects of dust and odour. This is considered appropriate for the nature and scale of industrial activities in and around Tuakau.

2.3 New Zealand guidelines

There are no relevant New Zealand guidelines for separation distances from industrial facilities to protect against air quality effects. The Auckland Council commissioned a discussion document on separation distances for industry that was published in July 2012¹. This discussion document was largely based on a review of Australian guidance (as discussed in the following section). This review adopted a similar approach to that set out in this report, however it differs from this report in that it relied on:

- An earlier (1990), now superseded, version of the Victorian EPA guidance; and
- Draft Tasmanian guidance for Standard Recommended Attenuation Distances (SRADs) that were provided to the report's authors but are not publicly available.

2.4 Australian guidelines

As discussed in Section 2.2, there are a number of Australian guidelines for separation distances based on potential for amenity effects, as shown in Table 2.1. The current Tasmanian SRADs were prescribed in 1996 and have not been used in preference to the more recent guidance from other Australian states.

The only other relevant international guidelines that have been identified are the Ontario Ministry for the Environment guidelines 'Compatibility between Industrial facilities and sensitive land uses' (1995). Given its age and limited scope we have not considered this Ontario guidance in detail.

It is important to note that these guidelines have been developed to minimise potential conflicts but do not remove the need for industrial activities to implement appropriate controls and internalise their environmental effects.

Table 2.1: Australian guidance documents on separation distances

Guidelines	State	Basis for guideline
South Australia EPA best guidance for separation distances (2007) (SA EPA)	South Australia	Odour and dust
Victorian EPA, Recommended Separation Distances for Industrial Residual Air Emissions – Guideline (March 2013) (Vic EPA)	Victoria	Odour and dust
Western Australia, Guidance for the Assessment of Environmental Factors, No. 3, Separation Distances between Industrial and Sensitive Land Uses (June 2005) (WA EPA)	Western Australia	Odour, dust, noise and vibration

¹ Emission Impossible Ltd. Separation distances for industry – a discussion document. July 2012

2.5 Measuring separation distance

The VicEPA recommends two different approaches for measuring separation distances based on the property size of both the industrial site and sensitive land use. These methods are described as the 'Urban' method and the 'Rural' method. The Rural method is only recommended for rural areas with property sizes greater than 4000 square metres.

In this report, it has been assumed that the separation distances will be used to inform decisions about re-zoning land to either Residential or Rural Residential zones, where the lot sizes will typically be less than 3000 square metres. Therefore the VicEPA Urban method is considered to be the most appropriate.

Using the Urban method, the separation distance is measured from the "activity boundary"² of the industrial activity to the property boundary of the nearest sensitive land use, as illustrated in Figure 2.1. This approach means that the separation distance is achieved through a combination of "internal" and "external" separation, i.e. some of the required separation distance is internalised within the property boundary of the industrial site.

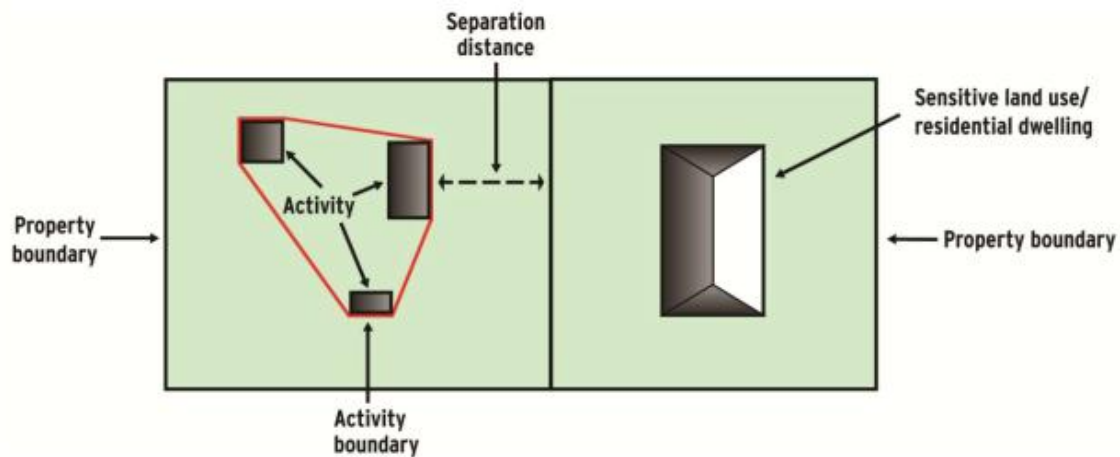


Figure 2.1: Measurement of separation distance (excerpt from Vic EPA Guidelines)

The measurement approach described above does not take account of the potential for expansion of an industrial activity in the future. However, if the separation distance were measured from the property boundary of the industrial site this would fully externalise the separation distance and could be seen as unnecessarily limiting the use of land outside the industrial site when the likelihood and nature/scale of any future expansion is unknown.

It is also noted that changes to the activity area on industrial site would usually require an amendment to the resource consent for discharges to air, which would trigger a full re-evaluation of the adequacy of site controls, etc.

In the context of informing decisions about the appropriateness of re-zoning land, the recommended separation distances should be measured from the activity boundary (of the industrial site) to the proposed boundary of the more sensitive zone as this will become the boundary of the nearest sensitive land use.

² The activity boundary of the industrial activity is the area that includes all current or proposed industrial activities with the potential to cause industrial residual air emissions.

3 Sensitivity to amenity effects of odour and dust

3.1 Sensitive activities

The recommended separation distances discussed in Section 2.4 refer to the distance between an industrial activity and a sensitive land use. The Vic EPA guidance defines "sensitive land uses" as *"any land uses which require a particular focus on protecting the beneficial uses of the air environment relating to human health and wellbeing, local amenity and aesthetic enjoyment for example residential premises, child care centres, pre-schools, primary schools, education centres or informal outdoor recreation sites"*.

Although the definition refers more broadly to human health and wellbeing, the VicEPA guidance is clear that it has been developed in consideration of industries that emit odour or dust, and therefore potential health effects of other air emissions are not explicitly factored into the separation distances.

Residential dwellings (and their immediate environs) are identified as sensitive to amenity effects. This is because people can spend a significant portion of the day at home and also because of the nature of activities being undertaken (eating, entertaining, enjoying leisure time, etc.). However, the sensitivity of zones that provide for residential activities can differ based on population density. This is because the risk of adverse effects increases as a function of number of people potentially exposed. Therefore, a zone that provides for a high density of residential activities is more sensitive to amenity effects than a zone that provides for a low density.

Under the Waikato District Plan – Franklin Section (October 2013), the Rural Residential zone provides for lots in the range of 2500 to 8000 square metres, with an average of no less than 3000 square metres. In comparison, the Residential zone provides for new lots with a minimum size of 350 square metres. The much higher density of houses provided for in the Residential zone means that the Residential zone has a higher sensitivity to amenity effects compared to the Rural Residential zone. This difference in sensitivity is particularly relevant when considering the appropriateness of 'up-zoning' an area from Rural Residential to Residential.

3.2 Activities suitable for buffer areas

The buffer area (i.e. the area within the recommended separation distance) can be used for a range of activities with a reduced sensitivity to amenity effects. Activities may be less sensitive to reduced air quality amenity because of the nature of the activities themselves, because they are only occupied for part of the time or because there are practical means to minimise the impact on their activities (for example dust filters on air conditioning inlets).

Activities within the buffer area should also not have the potential to generate appreciable dust or odour emissions (i.e. require any further separation distance). Examples of activities that would be appropriate within a buffer area include (not an exhaustive list):

- Agricultural activities;
- Service stations;
- Warehousing and distribution;
- Indoor service-type activities such as veterinary clinics or fitness centres;
- Light engineering; and
- Light industrial or manufacturing activities (excluding activities such as food production that require high air quality amenity) that do not generate appreciable dust or odour emissions.

4 Industrial and infrastructure activities in Tuakau

The following industrial facilities with resource consents for discharges to air of odour and/or dust have been identified in Tuakau and environs, from the Waikato Regional Council resource consents database:

- Tuakau Proteins Ltd, Lapwood Rd - meat rendering and blood processing plant;
- Envirofert Ltd, Geraghtys Rd – composting and vermiculture operation and a cleanfill;
- Pukekohe wastewater treatment plant, Parker Lane – wastewater treatment plan (application in process);
- Woodlane poultry, Harrisville Rd - Meat chicken (broiler) operation;
- Tuakau Saleyards, 57 George St – saleyards and stock effluent wastewater treatment facility (application in process);
- Dricon, Bollard Rd - aggregate and cement bagging plant; and
- Tuakau Grain, Bollard Rd - maize drying and agricultural feed storage, feed mill and animal feed manufacturing plant.

Other industrial-type activities that have been identified along Bollard Rd, which do not hold a resource consent but have the potential for emissions of odour and/or dust are:

- Timber treatment (Tuakau Timber Treatment);
- Sawmilling (Tuakau Timber Treatment and Beams and Timber Direct Ltd); and
- Fibreglass manufacturing (Fibreglass Tanks and Manufacturing Ltd).

There is a cluster of light industrial-type activities on the western side of River Rd to the south of Tuakau. These include:

- DR Howells Engineering – light engineering workshop;
- Riverland Poultry – poultry hatchery; and
- Tuakau Machinery – equipment sales and hire, small range of builders and landscaping supplies.

Light engineering and landscaping supplies yards have the potential to generate very small amounts of dust, however are not of a scale that would warrant maintaining a separation distance. These activities have not been considered further

Other specific sites that do not require a resource consent for air discharges but have been identified and considered in this report are:

- Welch poultry, Harrisville Rd – egg laying operation;
- Bromley Park – poultry hatchery; and
- Van den Brink, 18 Ryder Rd – poultry meat processing plant.

5 Separation distance from existing industries

5.1 Introduction

There are a number of existing industrial activities that need to be considered when identifying the suitability of areas for re-zoning land to more intensive residential development or establishment of activities sensitive to amenity aspects of odour and dust.

For many activities, such as intensive farming, composting and wastewater treatment plants, the required separation distance is dependent on the scale of the activity and the particular technology being employed. The following sub-sections recommend appropriate separation distances for the specific industrial activities identified in, and around, Tuakau.

The recommended separation distances are shown on Figures 1 to 3 in Appendix A.

5.2 Intensive poultry farming

A detailed discussion of separation distances from intensive poultry farming is set out in Appendix B. There is a large difference between the guidelines developed in Australia and those prepared for the Auckland Council³ (with greater separation distances recommended in the Auckland Council report). The authors of the report for Auckland Council considered that a greater separation distance was warranted in Auckland due to climatic factors that influence both odour emissions and dispersion.

The District Plan – Franklin Section (October 2013) contains rules for intensive poultry farming. The rules do not differentiate between egg laying and poultry meat (broiler) operations. The restricted discretionary activity rule (Rule 23A.4.2.3) requires a separation distance of 500m from an area used for intensive poultry farming and the boundary of any Residential, Village or Rural-Residential zone.

Having reviewed the available guidance, we make the following recommendations:

- No separation distance is required for hatchery operations, such as Riverland Poultry on River Rd and Bromley Park Hatcheries facilities at Browns Rd/Roberts Rd;
- For a small to medium scale, modern egg laying operation (<100,000 birds), a separation distance of 350m to a residential zone would appear to be adequate. This would apply to the Welch poultry adjacent to the Harrisville School; and
- A separation distance of 500m would be appropriate between a small (<50,000 bird) broiler farm or older style egg laying operation and a residential zone. This would apply to the Woodlane poultry operation on Harrisville Rd. This separation distance is consistent with the restricted discretionary activity rule discussed above.

5.3 Meat rendering and blood processing

The Tuakau Proteins Ltd rendering plant is located on Lapwood Rd (off River Rd) adjacent to the Waikato River. The plant processes 50,000 to 60,000 tonnes of raw material annually.⁴ This site has been in operation (under various ownerships) since the late 1970's and has had a history of odour problems.

Since about 2007 there has been extensive upgrade and modernisation of the site. These upgrades have included improvements to odour control from the rendering plant (including upgrade of the existing odour biofilter and installation of a new biofilter) and waste water treatment plant (including a new anaerobic lagoon cover and flare). In discussion with Environmental Waikato, it

³ Review of rules and management practices related to intensive poultry farming. Golder Kingett Mitchell. September 2007

⁴ Wastewater Treatment Technical Report (submitted to Waikato Regional Council as part of application for resource consent for renewal of discharge permit 107997). Mott McDonald. October 2014

appears that there have been significant improvements in the odour performance of the facility, however we understand that there are still occasional odour complaints.

Rendering facilities are recognised as having a high potential for odour effects and maintenance of an appropriate buffer distance is prudent.

The Victoria and South Australia guidance recommend 1,000m separation distance between rendering plants and sensitive activities. The Western Australia guidance recommends between 1,000 to 1,500m separation distance (depending on wastewater treatment/disposal system, location and size).

Based on this, we consider that a separation distance of 1,000m would be appropriate between the activity area of the Tuakau Proteins site and the boundary of any areas proposed for intensification of residential activities.

5.4 Composting facility

The Envirofert Ltd composting facility is located off Geraghty's Rd. The site receives a range of greenwaste and food wastes for composting. The operation comprises open windrows that are regularly turned. The windrows are fitted with active aeration and there is extraction to a biofilter to treat odour. The Assessment of Environmental Effects report prepared for Envirofert's application for air discharge consent indicated that the site had a throughput of approximately 30,000 tonnes per annum.⁵

The Victoria EPA has published guidance on appropriate separation distances for composting facilities taking into account the scale and methods used for the composting.⁶

The recommended approach is to compare the activity with several suggested "reference facilities" and to infer an appropriate separation distance based on the comparison of technology and scale. The recommended reference separation distances are reproduced in Table 5.1 and Table 5.2.

Table 5.1: Compost reference facility 1 (extract from Vic EPA 2013)

Type of feedstock	Technology being used	Size of the plant	Recommended separation distance (metres)
Green waste Vegetable organics Grease interceptor waste	Open air receival	1,200 tonnes per annum	>300
	Enclosed aerobic composting with secondary odour capture and treatment equipment	14,000 tonnes per annum	>500
		36,000 tonnes per annum	>800
		55,000 tonnes per annum	>1,000
		75,000 tonnes per annum	>1,200
	Open air maturation	90,000 tonnes per annum	>1,400

⁵ Assessment of Effects of Combining Food Waste with Greenwaste for Composting at the Envirofert Site. Air and Environmental Sciences Ltd. March 2008

⁶ Designing, constructing and operating composting facilities Vic EPA Publication 1588. March 2015

Table 5.2: Compost reference facility 2(extract from Vic EPA 2013)

Type of feedstock	Technology being used	Size of the plant	Recommended separation distance (metres)
Green wastes	Open air receival	1,200 tonnes per annum	>300
	Open turned windrow	14,000 tonnes per annum	>500
	Open air maturation	36,000 tonnes per annum	>800
		50,000 tonnes per annum	>1,000

For comparison with the reference facilities in Table 5.1 and Table 5.2, the technology at the Envirofert site would best be described as:

- Open air receival;
- Open turned aerobic windrows with odour capture and treatment; and
- Open air maturation.

Therefore, the facility is closest to reference facility 1, but additional separation would be warranted because, although there is odour capture, it will not be as efficient as if the composting were enclosed.

On this basis, we consider that a separation distance of the order of 1,000m would be appropriate between the activity area on the Envirofert site and the boundary of any areas proposed for intensification of residential activities.

5.5 Wastewater Treatment Plant

The Pukekohe Wastewater Treatment Plant (WWTP) is located on Parker Lane to the west of Tuakau. It is used for the treatment of wastewater from the wider Pukekohe area, including Pukekohe, Tuakau and, more recently, Pokeno. Prior to the construction of the new plant, wastewater was pumped into large aerated ponds. The WWTP was substantially upgraded to an activated sludge plant in 2010. In addition to the open-topped Sequencing Batch Reactors (SBR), there is an aerobic pond and another pond currently used for disposal of sludge.

With significant growth planned around Pukekohe and Paerata, there is a strong likelihood for the Pukekohe WWTP to be further upgraded in the future to provide additional treatment capacity. For this reason, a conservative approach is recommended to maintaining a buffer around the site.

The VicEPA recommends calculating the site-specific separation distance using treatment capacity (population-based) calculations, as follows:

- For mechanical/biological wastewater plants, separation distance (m) = $10 \times n^{0.3333}$
- For aerobic pond systems, separation distance (m) = $5 \times n^{0.5}$

Table 5.3: Recommended separation distances for WWTP based on VicEPA guidance

Type of plant	Treatment capacity (equivalent population)			
	<10,000	<20,000	<50,000	<100,000
Mechanical/biological WWTP	215	270	370	460
Aerobic pond systems	500	700	1100	1600

It is anticipated that the population of Franklin will increase to over 100,000 by 2051. A large proportion of this growth will occur in the Pukekohe, Tuakau and Pokeno areas, which are serviced by the Pukekohe WWTP. Given the likelihood of significant growth, a separation distance of 1,000m is recommended between the activity area of the WWTP (including any ponds) and the boundary of any areas proposed for intensification of residential activities.

5.6 Poultry meat processing

There is a poultry meat processing plant at 18 Ryders Rd (Van den Brink Poultry Ltd). This facility does not hold an air discharge consent. Environment Waikato has advised that they are not aware of any complaints or issues regarding odour from this facility.

Poultry processing facilities are typically identified as having the potential for odour effects. The potential for odour effects is greatly increased if there is on-site wastewater treatment or rendering activities.

The VicEPA does not recommend a separation distance for poultry processing facilities, without rendering, with a processing capacity of less than 200 Tonnes per annum. The South Australia EPA recommends a separation distance of 300m for poultry processing facilities of any size. Based on the more recent VicEPA guidance, no separation distance is recommended for the Van den Brink operation.

5.7 Tuakau Saleyards

The Tuakau Saleyards, owned by PGG Wrightson, are located at the northern end of Tuakau Township, behind the main shopping area. In a greenfields situation, a saleyards would not be recommended close to commercial or residential areas due to the potential for odour effects from holding stock and associated effluent. However, the Tuakau Saleyards are a long-established regional facility and they are a significant feature of Tuakau. It appears that this facility is well tolerated by the current community, however if Tuakau were to experience significant growth, particularly of people not from a rural background, then this tolerance could change over time.

PGG Wrightson has recently applied for a resource consent for discharges to air from a new effluent disposal system for effluent from stock held within the sale yards and stock trucks visiting the site. As this application is in the process of being notified to affected parties, the application documentation is not publicly available and has not been reviewed.

The VicEPA recommends a separation distance of 500m for stockyards holding more than 500 head of stock, which would be applicable to the Tuakau stockyards. This separation distance has not been shown on the attached figures because it would not reflect the reality of the existing environment and could therefore be misinterpreted. However, it is recommended that issue of air quality amenity be considered if there is any proposal within the Tuakau Structure Plan to change the sensitivity of the receiving environment within 500m of this facility.

6 Buffer for Tuakau/Whangarata Industrial area

The Tuakau/Whangarata Industrial area comprises the existing industrial activities along Bollard Rd, plus a relatively large greenfields area for future development. For the purposes of recommending a suitable buffer for the Industrial area, it has been assumed that the types of activities that are likely to establish in this area will be of a broadly similar nature to the existing activities.

Published separation distances for the existing activities along Bollard Rd have been identified and are summarised in Table 6.1 on the following page.

The two dominant facilities (in terms of both their spatial extent and requirement for separation distance) within this area are Tuakau Grains and Tuakau Timber Treatment. The recommended separation distances for sawmilling activities vary widely between the three State guidance documents. The Vic EPA guidance was recently reviewed (2013) and the separation distance for sawmills has been reduced to 250m from the 300m recommended in the previous guidance. We have placed more weight on the VicEPA guidance because of this recent review and revision.

Vic EPA recommends the same separation distance (250m) for large-scale grain drying, although it is noted that the other two States require a lesser distance of 100m.

Overall, it is recommended that a separation distance of 250m should be maintained between the Tuakau/Whangarata Industrial area and any areas proposed for residential development. This will enable future use of this area for a wide range of industrial-type activities within an industrial zone that provides for a reduced level of amenity. The buffer area would be suitable for a range of light industrial and commercial activities that do not require a high level of amenity as described in Section 3.2.

Table 6.1: Published guidance on separation distances for various industrial activities

Activity	South Australia EPA (2007)		Victoria EPA (2013)		Western Australia EPA (2005)		Distance (m)	
	Distance (m)	Conditions	Distance (m)	Conditions	Distance (m)	Conditions	Minimum	Maximum
Sawmill	100	>4,000m ³ per year	250	>10,000m ³ per year	500 to 1000	Depending on size	100	1000
Timber treatment	100	Using non-creosote preservative	100		300 to 500	Depending on size	100	500
Cement bagging	100		100	>500 TPA ¹	-		100	100
Storage and blending of grains	-		250	>20,000 TPA	500 ³		250	500
Grain drying	100		250	>20,000 TPA ²	-		100	250
Manufacture of fibreglass articles	300		250	>250 TPA	200		200	300

Notes:

¹ Based on manufacture of concrete articles or concrete batching plant² Based on storage and blending of grains³ Grain elevator

7 Applicability

This report has been prepared for the benefit of Waikato District Council with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Tonkin & Taylor Ltd

Authorised for Tonkin & Taylor Ltd by:



Jenny Simpson

Snr Environmental Engineer

JMS
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Appendix A: Figures



See Figure 3

See Figure 2

WELCH POULTRY

WOODLANE POULTRY

PUKEKOHE WWTP

TUAKAU

ENVIROFERT

TUAKAU PROTEIN

SCALE 1: 20,000

0 200 400 600 800 1000(m)

Aerial photo sourced from Auckland Council GIS Website

ORIGINAL IN COLOUR



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DRAWN	RBS	Aug.15
DRAFTING CHECKED		
APPROVED		
CADFILE :	309 14-AQ-F 1.dwg	
SCALES (AT A3 SIZE)	1:20000	
PROJECT No.	309 14	

WAIKATO DISTRICT COUNCIL
TUAKAU STRUCTURE PLAN
RECOMMENDED AIR QUALITY SEPARATION DISTANCES
Overall Plan

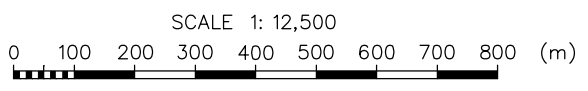
FIG. No. Figure 1

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Aerial photo and boundaries sourced from Auckland Council GIS Website



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DRAWN	RBS	Aug.15
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APPROVED		
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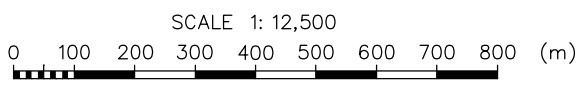
WAIKATO DISTRICT COUNCIL
 TUAKAU STRUCTURE PLAN
 RECOMMENDED AIR QUALITY SEPARATION DISTANCES
 Southern Tuakau

FIG. No. Figure 2

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Aerial photo and boundaries sourced from Auckland Council GIS Website



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WAIKATO DISTRICT COUNCIL
 TUAKAU STRUCTURE PLAN
 RECOMMENDED AIR QUALITY SEPARATION DISTANCES
 Northern Tuakau

FIG. No. Figure 3

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Appendix B : Separation distances for intensive poultry farming

Intensive poultry farming

Introduction

There are several poultry operations in the vicinity of Tuakau, including egg laying and broiler operations. Broiler operations typically have greater potential for odour effects compared to a modern egg laying operation.

In broiler operations, day old chicks are brought onto site and grown-on to market weight. The birds are housed on the floor on litter (typically untreated wood shavings). Modern broiler sheds typically have computer controlled ventilation and are classed as either cross-flow or tunnel design. Heating and ventilation are controlled to manage temperature and humidity. At the end of the cycle (typically around 6 weeks) the birds are harvested and sent to an abattoir for processing. The poultry litter is cleaned out and the shed sanitised ready for the next flock. There is usually a stand-down period before fresh litter is brought onto site and the next growing-on cycle is started. Litter is typically removed over a single day and disposed off-site. Chicken manure/litter is commonly applied to horticultural land and this can be a source of odour at those sites. Chicken fatalities are also typically disposed off-site (e.g. refrigerated and sent to a rendering facility).

Modern laying operations typically comprise colony cages. The chickens are housed in computer-controlled ventilated sheds, using similar cross flow or tunnel designs as broiler operations. Both egg collection and manure removal are automatic. The manure is collected on conveyor belts underneath the cages and conveyed to covered storage for offsite disposal.

Australian guidance

In Victoria, there is a specific environmental Code for broiler farms, which includes recommended separation distances.⁷ The separation distance is measured from the nearest external edge of the broiler shed to the nearest external edge of the sensitive use (that is the nearest edge of the house) on land beyond the broiler farm property. The Victorian Code specifies a minimum separation distance for broiler farms of 250m, increasing with number of chickens. For a 100,000 bird farm, the separation distance is 325m increasing to 427m for a farm with 200,000 birds.

The South Australia guidance (SA EPA, 2007) includes a method to calculate site-specific separation distances taking into account the number of chickens, type of farm, terrain, etc. Table B.1 shows the separation distances calculated for a 50,000 chicken operation on flat, open terrain, assuming manure is disposed offsite.

Table B.1: Separation distances for poultry farming calculated using South Australia guidance

Type of receptor	Separation distance (m)			
	Broiler operation		Egg laying operation	
	50,000 birds	100,000 birds	50,000 birds	100,000 birds
Town	520	755	310	455
Rural residential	390	570	230	340
Residential dwelling	260	380	155	230

⁷ The Victorian Code for Broiler Farms 2009

There is also national guidance in Australia for egg laying operations.⁸ The guidance provides for a minimum separation distance of 500m from any residential or rural residential zone and 250m from any neighbouring dwelling.

Auckland guidance

In 2007, Golder Kingett Mitchell prepared a report for the Auckland Regional Council that included consideration of appropriate separation distances for intensive poultry operations in the Auckland region.⁹ This work included developing representative odour emission profiles and dispersion modelling. The recommended separation distances developed through that work are summarised in Table B.2.

Table B.2: Recommended separation distances for poultry farming from Golder Kingett Mitchell

Type of activity	Number of chickens	Distance to neighbouring dwelling (m)
Broiler and older egg layer operations	<100,000	500
	100,000 to 180,000	700
Egg layer operations using automated shed ventilation and manure conveyors with manure removed weekly from the site	<180,000	350

Current district plan provisions

The Waikato District Plan – Franklin Section (October 2013) provides for intensive farming of poultry (within buildings) as a restricted discretionary activity in the Rural zone under Rule 23A.4.2.3 provided the following separation distances from all areas used for the farming operation are met:

- At least 500 metres from the boundary of a Residential, Village or Rural-Residential zone;
- At least 100 metres from any existing dwelling on a neighbouring property, including those separated by a road; and
- At least 20 metres from the boundary of the site.

If the proposed activity does not comply with this rule it becomes a non-complying activity. This rule does not apply to free range poultry farming or poultry hatcheries.

⁸ Environmental Guidelines for the Australian Egg Industry. Australian Egg Corporation Ltd. June 2008

⁹ Golder Kingett Mitchell. Review of Rules and Management Practices Relating to Intensive Poultry Farming. September 2007

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