

## **Submission on proposed Plan Change 16, Tuakau Structure Plan (Stage 1) Waikato District Plan**

### **To:**

Waikato District Council  
Private Bag 544  
Ngaruawahia  
Via Email: [Jane.Macartney@waidc.govt.nz](mailto:Jane.Macartney@waidc.govt.nz)

### **Submitter Details:**

2SEN Ltd and Tuakau Estates Ltd

Email: [cse@pacificprojects.co.nz](mailto:cse@pacificprojects.co.nz)  
Phone: 021 467 736

### **Trade Competition**

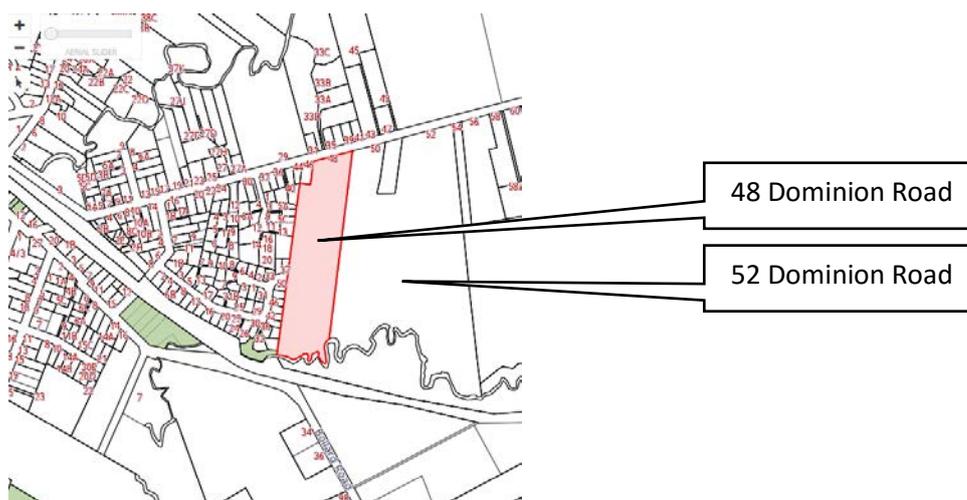
The submitter will not gain an advantage in trade competition through this submission.

### **Specific Provision to Which the Submission Relates**

- (a) Chapter 15C;
- (b) Schedule 21E: Tuakau Living Zone Rules (New Residential);
- (c) Schedule 24G: Tuakau Industrial Zone;
- (d) Plan Change 16 Schedule 21 E: Map 3 Tuakau Living Zone (New Residential Zone) – Dominion Road;
- (e) Plan Change 16 Schedule 24G: Map 6 Tuakau Industrial Zone Bollard and Whangarata Roads;  
and
- (f) Any consequential amendments required to give effect to the relief sought.

## 1. Reasons for Submission

- 1.1 The submitters own 48 Dominion Road (Lot 1 DP 485993 held in CT 696/709) and 52 Dominion Road (Lot 2 DP 371796 held in CT 290284) (Attachment A). The sites have areas of 5.0769ha and 14.089ha respectively. Both are currently zoned Rural under the Waikato District Plan. The properties have a gentle undulating contour, gradually sloping down to the Kairoa Stream (which forms the southern boundary). The sites are currently grazed and contain no residential buildings.



**Figure 1: Location Plan**

- 1.2 Plan Change 16 (**PC16**) proposes to alter the zone over approximately 1/2 of the sites to Tuakau New Residential. The remainder of the site is proposed to remain Rural.



**Figure 2: Extract from Map 3, Plan Change 16**

- 1.3 The reason for the submission is, as explained in more detail below, the proposed location of the Tuakau New Residential zone boundary is not considered to have been appropriately

selected. Further, the density of land development proposed (average site area 1:650 m<sup>2</sup>) is not considered to be an efficient use of land.

## 2. Relief Sought

2.1 Relief sought is summarised as follows:

- (a) Relocating the Tuakau New Residential Zone – Dominion Road (**TNR**) boundary on the submitter sites from its current position to within 150 m of the southern boundary of the North Island Main Trunk Rail Line (including consequential modifications to Map 3);
- (b) Modification of Subdivision Rule 21E.56 to provide for density controls within the Tuakau New Residential Zone of 1: 500 m<sup>2</sup> net site area (average) per dwelling; and
- (c) Any consequential changes necessary to give effect to the release sought.

2.2 The following sections of PC16 are generally supported: Chapter 15C, Schedule 21E and Schedule 24G. In particular; it is noted that policies require separation of incompatible activities and that activities mitigate their effects at the zone boundary (e.g. Policy 15C.10.4).

### Tuakau Dominion Road (New) Residential Zone Boundary

2.3 Figure 2 illustrates<sup>1</sup> in orange the extent of TNR zone. As described in Council’s Summary Statutory Report<sup>2</sup>, the genesis of PC16 rests with the Tuakau Structure Plan and its supporting documents. With specific reference to the Dominion Road area, the Statutory Summary Report notes<sup>3</sup> the following in regards how the extent of the TNR zone was established relative to the submitter’s sites:

*In determining the southern extent of the proposed New Residential Zone, Council has considered the recommended acoustic and air discharge buffer of approximately 250-300 metres measured from the northern boundary of the existing Business-zoned property owned by Fellrock Developments Limited and occupied by Tuakau Timber Treatment. However, as a result of community consultation which informed the adopted Tuakau Structure Plan, Council has determined that the buffer needs to be more extensive than that recommended in the expert reports. This is because of the concern raised primarily by Tuakau Timber Treatment regarding the reverse sensitivity effects of noise from their permitted industrial activities in the existing Business Zone and the complaints received by them and Council from residents in the existing Residential Zone on the southern side of Dominion Road. Therefore, the southern extent of the proposed New Residential Zone on Map 3 is aligned with the boundary shown on the adopted Tuakau Structure Plan which is considered acceptable to Tuakau Timber Treatment. The buffer area shown on the Tuakau Structure Plan varies between approximately 300 metres at the western boundary of the property at 48 Dominion Road and approximately 450 metres at the*

<sup>1</sup> Taken from Plan Change 16 Schedule 21 E: Map 3 Tuakau Living Zone (New Residential Zone) – Dominion Road.

<sup>2</sup> Part A: Summary Statutory Report Plan Change 16 to the Waikato District Plan (Waikato Section and Franklin Section) Tuakau Structure Plan - Stage 1 (Residential and Industrial Rezoning), pages 4-6.

<sup>3</sup> Page 37.

*eastern boundary of the property at 52 Dominion Road, with both measurements taken from the northern boundary of the existing Business Zone.*

- 2.4 In summary, the Council's reasoning for locating the TNR zone boundary in this position is effectively to provide a buffer to protect existing industrial activities within the Bollard Road business and industrial area. The width of buffer appears to be based upon concerns raised by businesses within the Bollard Road area.
- 2.5 For the reasons set out below, a 'buffer' of the extent proposed within PC16 is not required and the extent of the TNR should be extended from the currently proposed position to at or near the southern boundaries (Kairoa Stream) of the subject sites for the following reasons:
- (a) There is insufficient acoustic basis for limiting TNR zone to the extent proposed.
  - (b) A setback of the TNR from the North Island Main Trunk Rail Line (southern boundary) for the purpose of managing potential air discharges (150m) is supported.
  - (c) Based on existing technical reports there are no geotechnical, infrastructure, archaeological, transport or landscape impact effects likely to arise from the extension of the TNR which cannot be appropriately managed or mitigated.
  - (d) The technical reports provided (acoustic and air quality) provides a site-specific evidence of more detail than that available during the formulation of the Tuakau Structure Plan and Plan Change 16. This more detailed provision of information supports an updated position relative to the proposed TNR boundary on the subject sites.
- 2.6 These reasons are outlined in more detail below.

#### **A. Acoustic Assessment**

- 2.7 Attachment B to this submission contains an acoustic assessment prepared by Hegley Acoustics which concludes the following:
- (a) Measured background noise levels ( $L_{95}$ ) at the subject sites' southern boundary are in the vicinity of 30bDA (night) and 40dBA (day) therefore not of a level which would preclude unfettered residential use.
  - (b) Noise levels received at the subject site do not therefore warrant the imposition of a buffer for the purposes of providing acoustic amenity for future possible residential uses on the subject sites.
- 2.8 Additional matters of note include the following:
- (c) Proposed Rule 24G.18.1(a) limits noise within the Tuakau Industrial Zone to 75dBA<sub>(L10)</sub> between 7 a.m. to 10 p.m. and 45dBA<sub>(L10)</sub> between 10 p.m. and 7 a.m. with 75dBA<sub>(Lmax)</sub> the following day. Proposed Rule 24G.18.1(b) requires *in another zone* noise does not exceed 55dBA<sub>(L10)</sub> between 7 a.m. to 10 p.m. and 40dBA<sub>(L10)</sub> between 10 p.m. and 7 a.m. with 70dBA<sub>(Lmax)</sub> the following day.

The structure of this rule indicates high noise levels are acceptable within the zone with no noise control being applied at the boundary of the sites with the same (Industrial) zone.

The rule also indicates that noise levels at the boundary of *another zone* (ie. not Industrial) must meet lower limits. The practical effect of this is that industrial zoned sites on the periphery of the Tuakau Industrial Zone area will need to manage on-site noise to achieve compliance with Rule 24G.18.1(b) (relative to the adjoining non-Tuakau Industrial zoned sites).

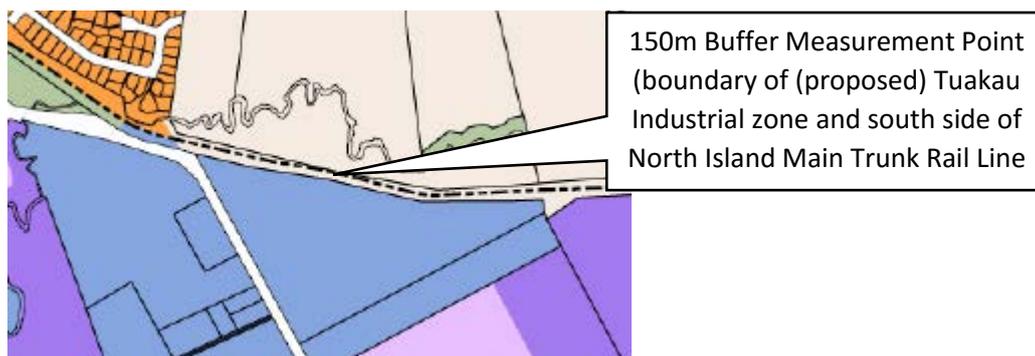
- (d) Map 4<sup>4</sup> proposes a TNR-South zone immediately abutting Tuakau Industrial Zone land with no noise buffer proposed. This approach is inconsistent compared with the approach taken for TNR Dominion Road (Map 3) where there is no immediately adjoining Tuakau Industrial Zone and a buffer has been imposed.

## B. Air Quality Assessment

- 2.9 Attachment C contains an air quality assessment prepared by Aecom which concludes that:
- (a) On site assessment confirms there are no dust or odour emissions which would support the imposition of a buffer on the subject sites.
  - (b) Future air discharges would need to meet relevant statutory requirements or obtain resource consent. Both of these compliance options would require management of any discharges either by way of permitted activity standards or conditions on any approved discharge consent.
  - (c) A 150m separation distance is recommended from the northern edge of the Tuakau Industrial zone.
- 2.10 The location of the separation between (proposed) Tuakau Industrial zoned land and the proposed TNR zone should be measured from the southern boundary of the North Island Main Trunk Rail Line/proposed extent of the Tuakau Industrial zone (**Figure 3**). This location is the outer extent of where industrial air discharging activities could reasonably be anticipated to be located.

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<sup>4</sup> Plan Change 16 Schedule 21 E: Map 4 Tuakau Living Zone (New Residential Zone) – Tuakau South.



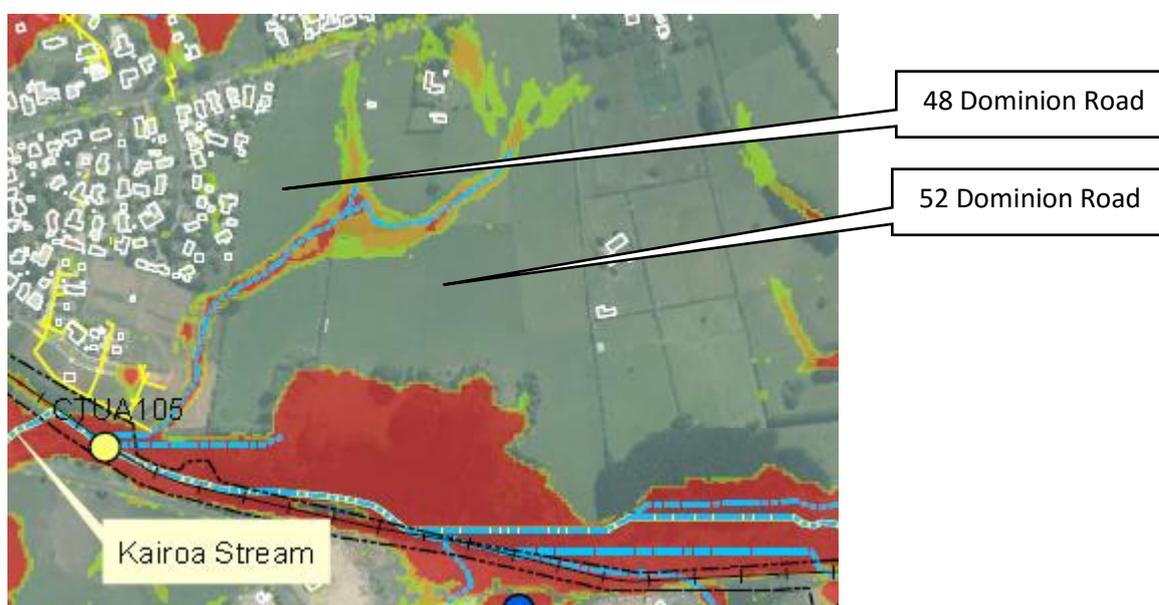
**Figure 3: 150m Buffer Measurement**

### C. Other Constraints

- 2.11 PC16 is supported by a number of technical reports and assessments. These reports have been considered relative to the area of land proposed to be zoned TNR (i.e. southern area of the sites between the TNR zone and Kairoa Stream).

#### Flooding Hazards

- 2.12 Tonkin and Taylor<sup>5</sup> have undertaken catchment modelling which identifies flooding hazards. In particular, Map 1 (extract below within **Figure 4**) identifies an overland flow path bisecting the site and the area adjacent to Kairoa Stream being subject to flooding hazards. Areas marked in red are noted as 'significant flooding hazard'. The red areas extend both over the subject sites and also properties to the south of Kairoa Stream.



**Figure 4: Flood Hazard Extent (attributed to Tonkin and Taylor<sup>6</sup>)**

<sup>5</sup> Draft Catchment Management Plan Tuakau Structure Plan Area, July 2014.

<sup>6</sup> Draft Catchment Management Plan Tuakau Structure Plan Area, July 2014, page 57.

- 2.13 The overland flow path/flood hazard area which bisects the site would be appropriately addressed at the time subdivision consent along with establishment of minimum floor areas for dwellings.
- 2.14 Assuming a TNR zone is applied across the majority of the subject sites, there is ample space to accommodate an overland flow paths, flood hazard areas along with any associated open space or riparian areas.
- 2.15 Failure to extend the TNR to encompass the majority of the sites would result in a moderately large area of land zoned TNR being excluded from potential residential development in order to accommodate hazard areas. This would reduce overall dwelling yields on the site and likely not provide for the level of growth anticipated in this location.
- 2.16 Overall, there are no apparent flood hazard or catchment management reasons which preclude the majority of the sites being zoned TNR.

#### Infrastructure

- 2.17 Beca<sup>7</sup> has provided a technical report assessing water supply and wastewater capacity. The report assesses growth predictions until 2031<sup>8</sup>. The Beca report identifies<sup>9</sup> the subject sites as containing low density residential (600 m<sup>2</sup> to 1000 m<sup>2</sup>) in light blue and large lot residential (light green).



**Figure 4: Development Level - Infrastructure Capacity Report (attributed to Beca)**

<sup>7</sup> Tuakau Structure Plan: Water and Wastewater Technical Assessment, 29 August 2014.

<sup>8</sup> Page 5, Section 3.

<sup>9</sup> Page 14.

- 2.18 It is noted that the Beca assessment anticipates a higher level of development than the zone maps within PC16.
- 2.19 The report concludes that, with appropriate investment, predicted growth to 2031 can be accommodated by water supply and wastewater disposal networks.

#### Transportation

- 2.20 Aecom<sup>10</sup> has prepared an integrated transport assessment (ITA). The ITA identifies<sup>11</sup> the subject sites as accommodating development in the same manner as the Beca infrastructure assessment (**Figure 5**); low density residential (600 m<sup>2</sup> to 1000 m<sup>2</sup>) in light blue and large lot residential (light green). This is a higher level of development than the zone maps within PC16.
- 2.21 The ITA makes the following conclusions regarding Dominion Road<sup>12</sup>:

*Within Tuakau the following recommendations are made with respect to the transport network:-*

- 1) *The extent of development along Dominion Road should be limited as it is difficult and is unlikely to be economical to upgrade and extend Dominion Road to Ridge Road, or to link it to Barnaby Road to provide some network connectivity. Without such connectivity it would become an inefficiently serviced cul-de-sac placing increasing pressure on the Dominion Road/Harrisville Road intersection.*

- 2.22 No requirements for transportation upgrades have been identified within PC16 (or supporting technical reports) relative to Dominion Road and proposed growth in the vicinity. Should further development (beyond that anticipated within Figure 5) be proposed, a suitable transport assessment would be required and that assessment should consider the effects of increased intensification on the Dominion Road and Harrisville Road intersection.

#### Archaeology

- 2.23 An archaeological and heritage assessment<sup>13</sup> has been prepared which identifies known and likely areas of archaeological and heritage importance in the Tuakau area. Key recommendations from that report (relative to the subject sites) are summarised<sup>14</sup> as:

*[...] a substantial number of potential pre-1900 archaeological sites may be found:*

- *along the streams that drain into the Waikato River;*

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<sup>10</sup> Tuakau Structure Plan, Integrated Transport Assessment, 18 June 2014.

<sup>11</sup> Tuakau Structure Plan, Integrated Transport Assessment, 18 June 2014, Appendix B.

<sup>12</sup> Page 5.

<sup>13</sup> Tuakau Structure Plan, Archaeological Heritage Alexy Simmons and Malcolm Hutchinson Simmons & Associates Ltd, May 2014.

<sup>14</sup> Tuakau Structure Plan, Archaeological Heritage Alexy Simmons and Malcolm Hutchinson Simmons & Associates Ltd, May 2014, page 136.

**Issue; Unrecorded sites on or adjacent to the streams that drain into the Waikato River**

- The research indicates there is a high potential for unrecorded archaeological sites adjacent to the streams located on private property.

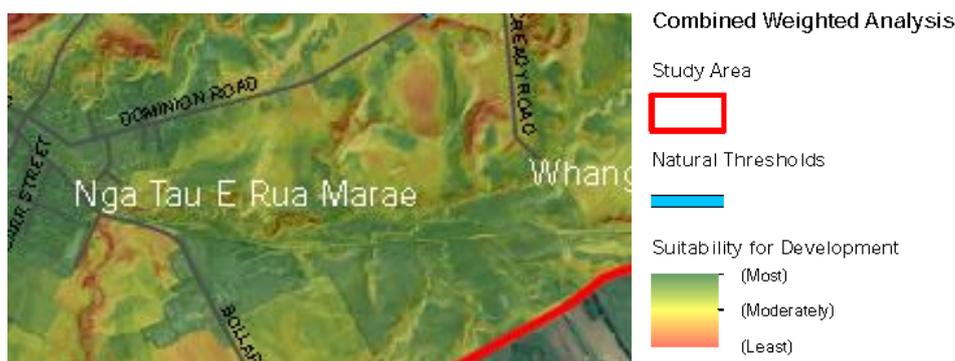
**Options; Unrecorded sites on or adjacent to the streams that drain into the Waikato River**

- Status quo. Use the existing heritage provisions of the operative Waikato District Plans to manage affects to any recorded or unrecorded archaeological sites adjacent to the stream.
- Conduct an archaeological survey of the land adjacent to the stream to identify any archaeological sites and development recommendations for future development

2.24 This assessment indicates there is the possibility of unrecorded sites adjacent to the Kairoa Stream. Notwithstanding the extent of flooding hazards adjacent to the Kairoa Stream identified in **Figure 4**, either of the suggested options could be applied to ensure any unrecorded sites are appropriately located and recorded or protected.

Visual Assessment

2.25 An assessment of potential landscape effects<sup>15</sup> has been completed to support PC16. The report concludes with a map assessment rating areas on their suitability for development. The subject sites are within areas of high to moderate suitability for development.



**Figure 6: Combined Weighted Analysis - Landscape Suitability for Urbanisation<sup>16</sup> (Attributed to Mansergh Graham Landscape Architects Ltd)**

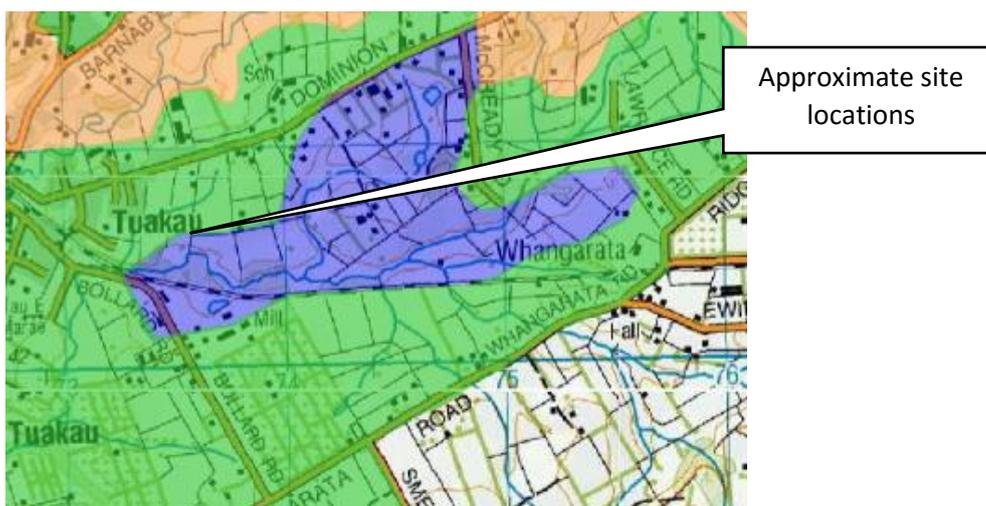
Council has supported the development over approximately half of the sites which is in the most/moderate suitability area. The area to the south of the TNR is identified as having most/moderate suitability; however it is assumed that this assessment is based on the current level of development (i.e. none - pasture). It is anticipated that the level of suitability for development for the southern areas of the sites would dramatically increase once the proposed PC16 TNR zone is established.

<sup>15</sup> Tuakau Study Area | Assessment of Landscape, Visual and Amenity Effects Mansergh Graham Landscape Architects Ltd.

<sup>16</sup> Tuakau Structure Plan Area Preliminary Contaminated Land Assessment, June 2014, page 25.

## Geotechnical

- 2.26 A geotechnical suitability assessment has been prepared by Aecom<sup>17</sup>. The report concludes that the subject sites have been identified as *Low* or *Some* risk (Category A (green) or B (purple)) from a geotechnical perspective. Category B limitations are summarised<sup>18</sup> as:
- Possible for geohazards to be present
  - Moderate level of engineering input appropriate
  - Residential buildings likely to adopt NZS3604 with shallow ground improvement or foundation deepening away from geohazards
  - Minor bulk earthworks may be needed to recontour for development
  - Individual and cumulative effects of stormwater and wastewater discharges to be assessed



**Figure 7: Geotechnical Limitations (attributed to Aecom<sup>19</sup>)**

- 2.27 Additional Categories C and D (moderate and high risk) do not apply therefore it is concluded that there are no significant geotechnical limitations present on the sites.

## Ground Contamination

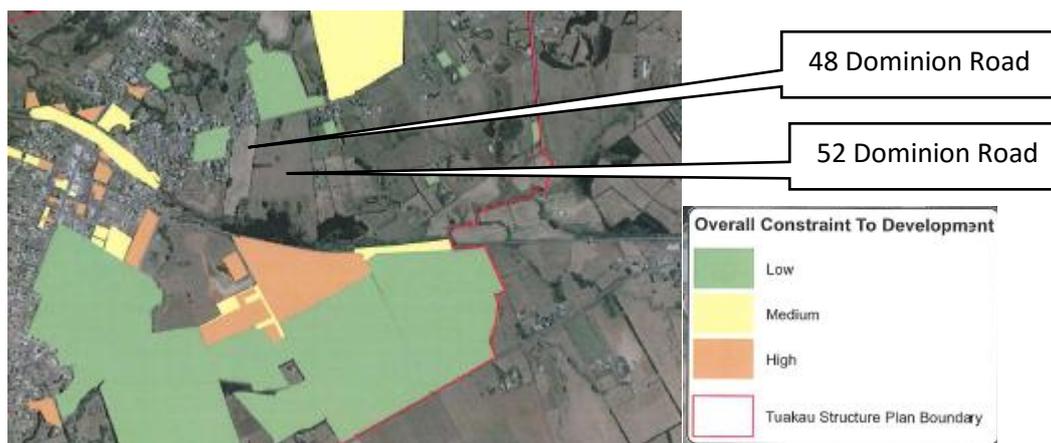
- 2.28 A preliminary contaminated land assessment has been prepared by Tonkin and Taylor<sup>20</sup> assessing the PC16 area. The report concludes that the subject sites have not been identified as at risk of containing HAIL activities. Potential land contamination therefore does not restrict site development.

<sup>17</sup> Tuakau Structure Plan Geotechnical Suitability Assessment, 22 August 2014.

<sup>18</sup> Tuakau Structure Plan Geotechnical Suitability Assessment, 22 August 2014, page 23.

<sup>19</sup> Tuakau Structure Plan Geotechnical Suitability Assessment, 22 August 2014, page 23.

<sup>20</sup> Tuakau Structure Plan Area Preliminary Contaminated Land Assessment, June 2014.



**Figure 8: Areas of Potential Land Contamination Risk<sup>21</sup> (Attributed to Tonkin and Taylor)**

2.29 Overall, there has been a significant amount of detailed technical assessment which includes the entirety of the subject sites (not just those areas within PC16) and no insurmountable constraints to residential development have been identified. The additional site-specific acoustic and air quality assessments conclude that a separation of the extent proposed is not required to mitigate air-quality or acoustic effects. Finally, any further detailed assessment (for example a detailed analysis of overland flow path and flood hazards) are more appropriately dealt with on a site by site basis at the time of a subdivision consent enabling development.

### Subdivision Provisions

2.30 Rule 21E.56 requires the following:

*21E.56.1*

*Subdivision is a restricted discretionary activity if:*

*(a) every allotment, other than a utility allotment or access allotment, has a net site area of at least*

*(i) 450m<sup>2</sup>, and*

*(ii) the average net site area of all allotments is at least 600m<sup>2</sup>, and*

*(iii) there is combination of allotments of which:*

- *50% of total allotments are at least 550m<sup>2</sup>, and*
- *25% of total allotments are at least 650m<sup>2</sup>, and*

*(b) a utility allotment does not exceed 50m<sup>2</sup>.*

2.31 The density proposed within PC16 is inconsistent with the density provided both on the (recently developed) adjoining sites to the west of 48 and 52 Dominion Road. In particular, the Moria Road development was completed under the (Franklin) Residential zone which provides for 350m<sup>2</sup> net (delineated) area (Rule 27.6.1.1A). It is also noted that new residential zones in Pokeno have a minimum average allotment size of 500 m<sup>2</sup> (excluding allotments over 800 m<sup>2</sup> in area).

<sup>21</sup> Tuakau Structure Plan Area Preliminary Contaminated Land Assessment, June 2014, page 25.

2.32 The following modifications to Rule 21E.56 are considered necessary to ensure that development is enabled whilst being compatible with the small townships/rural environment in which it is located.

*21E.56.1*

*Subdivision is a restricted discretionary activity if:*

*(a) every allotment, other than a utility allotment or access allotment, has a net site area of at least*

*(i) ~~450~~ 400m<sup>2</sup>, and*

*(ii) the average net site area of all allotments (less than 800m<sup>2</sup>) is at least ~~600~~ 500m<sup>2</sup>, and*

*(iii) there is combination of allotments of which:*

*• ~~50%~~ 50% of total allotments are at least 550m<sup>2</sup>, and*

*• ~~25%~~ 25% of total allotments are at least 650m<sup>2</sup>, and*

*(b) a utility allotment does not exceed 50m<sup>2</sup>.*

## Hearing

The submitter wishes to be heard in support of this submission. If others make a similar submission, the submitter will consider presenting a joint case with them at a hearing.

## Address for service of submitter:

Eclipse Group Limited  
Attention: Cath Heppelthwaite  
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Wellesley Street  
Auckland 1141

[cath@eclipseplanning.co.nz](mailto:cath@eclipseplanning.co.nz)

021 21 22 495

# Attachment A



## COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952



### Search Copy

  
R. W. Muir  
Registrar-General  
of Land

**Identifier** **696709**  
**Land Registration District** **North Auckland**  
**Date Issued** 04 September 2015

#### Prior References

NA9B/1257

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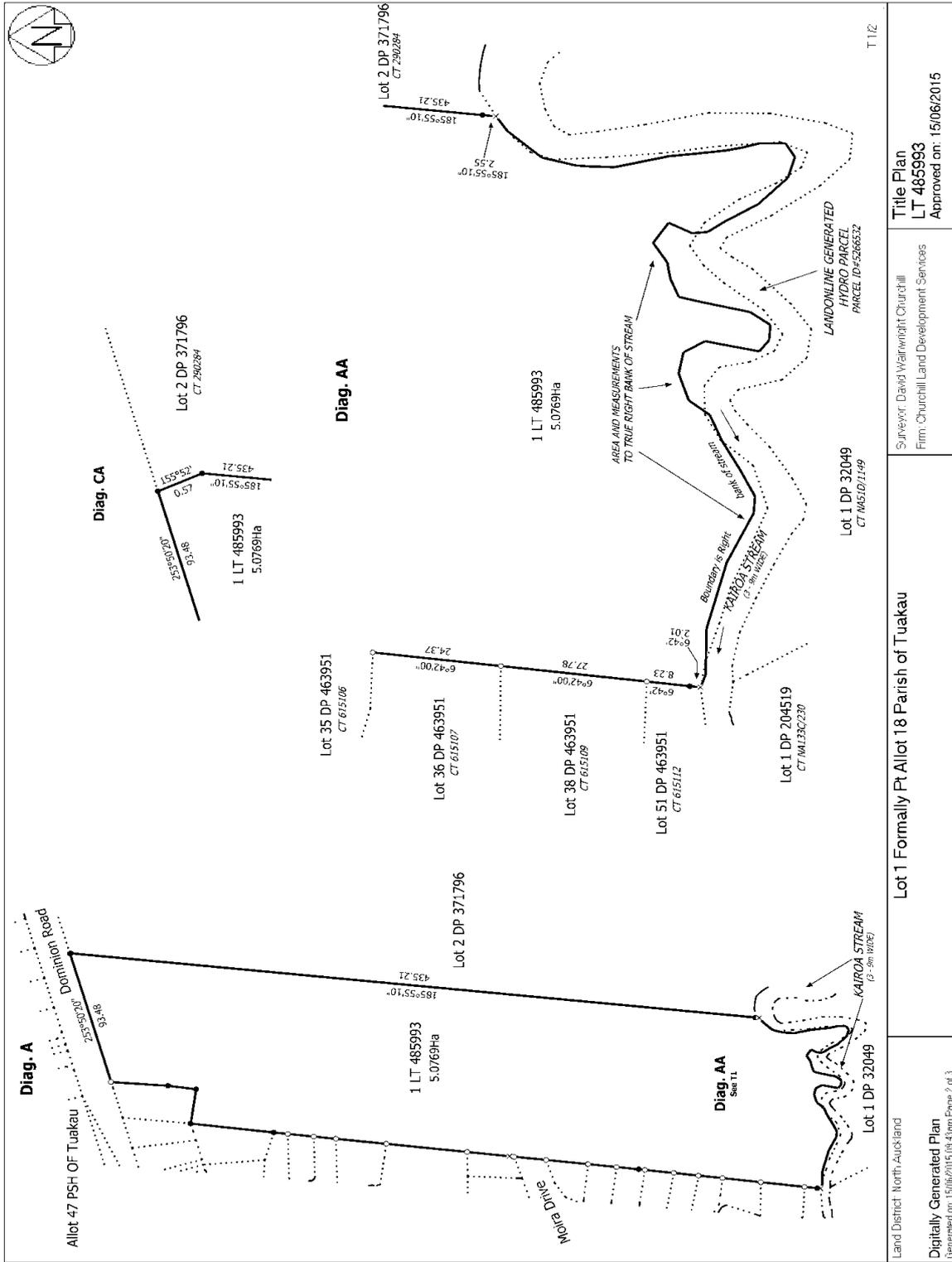
**Estate** Fee Simple  
**Area** 5.0769 hectares more or less  
**Legal Description** Lot 1 Deposited Plan 485993

#### Proprietors

2Sen Limited

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#### Interests



<p>Land District North Auckland</p>	<p>Lot 1 Formally Pt Allot 18 Parish of Tuakau</p>	<p>Title Plan LT 485993 Approved on: 15/06/2015</p>
<p>Digitally Generated Plan Generated on: 15/06/2015 09:45am Page 2 of 3</p>		<p>Surveyor: David Wainwright Churchill Firm: Churchill Land Development Services</p>



**COMPUTER FREEHOLD REGISTER  
UNDER LAND TRANSFER ACT 1952  
Limited as to Parcels**



  
R. W. Muir  
Registrar-General  
of Land

**Search Copy**

**Identifier** **290284**  
**Land Registration District** **North Auckland**  
**Date Issued** 28 July 2006

**Prior References**

NA1041/35                      NA587/97

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**Estate**                      Fee Simple  
**Area**                        14.0890 hectares more or less  
**Legal Description** Lot 2 Deposited Plan 371796

**Proprietors**

Tuakau Estates Limited

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**Interests**

A302752 Certificate that a pipeline over part herein marked A on DP 371796 passes through the within land -  
30.7.1968 at 9.00 am

B983136.1 Variation of Pipeline Easement A302752 - 24.4.1989 at 1.48 pm





1/355 Manukau Road  
Epsom, Auckland 1023  
PO Box 26283  
Epsom, Auckland 1344

T: 09 638 8414  
E: [hegley@acoustics.co.nz](mailto:hegley@acoustics.co.nz)

# PROPOSED RESIDENTIAL DEVELOPMENT

## 48 & 52 DOMINION ROAD, TUAKAU

### ASSESSMENT OF NOISE EFFECTS

Report No 16204

Prepared for:

*Pacific Engineering Projects Ltd  
Auckland  
August 2016*

Prepared by: .....

  
Nevil Hegley

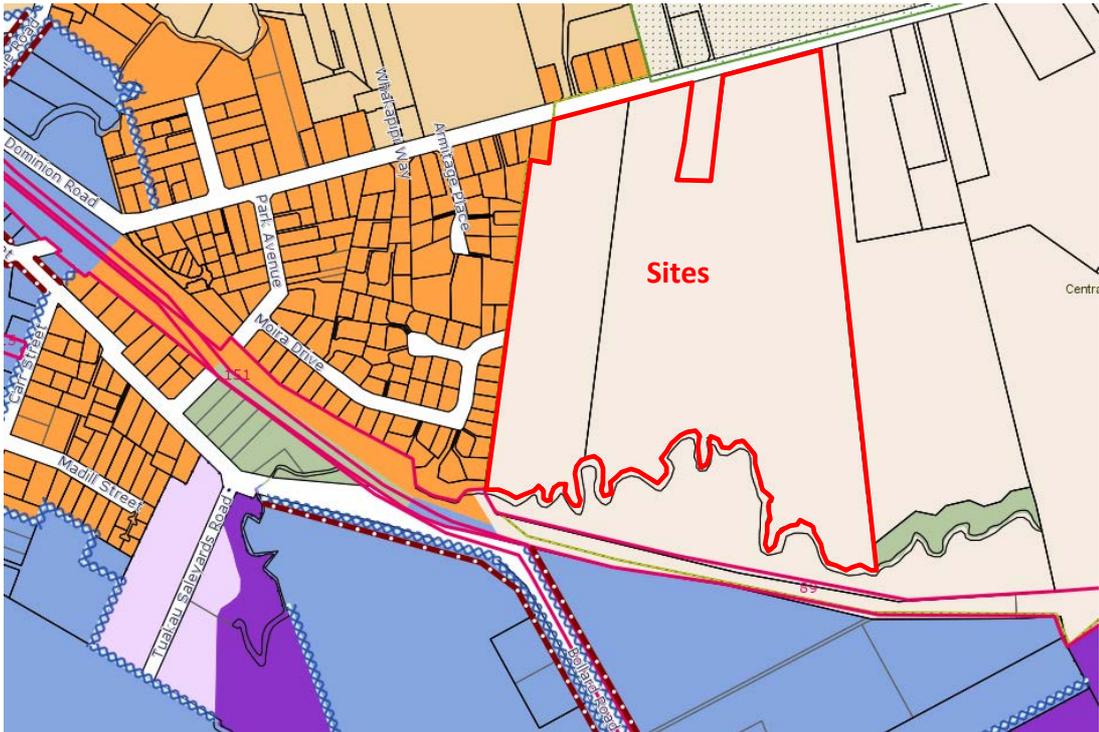
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## 2 DISTRICT PLAN REQUIREMENTS

As shown on Figure 2 the site is currently zoned Rural in the Operative Waikato District Plan, Franklin Section (District Plan). To the east there is a continuation of the Rural Zone to the west there is a residential zone with a Business Zone to the south across the North Island Main Trunk Railway.



**Figure 2. Site Zoning**

There are no specific noise rules in the Waikato District Plan (Franklin Section) for a rural zone. For the residential zone rule 27.6.1.15, Noise Levels states:

*No activity in the Residential Zone shall cause the following sound levels  $L_{10}$  to be exceeded at or within the boundary of any other (affected) site, for the specified times:*

<b>Time/hours</b>	<b><math>L_{10}</math></b>	<b><math>L_{max}</math></b>
0700 to 2200	45dBA	75dBA
2200 to 0700	35dBA	65dBA

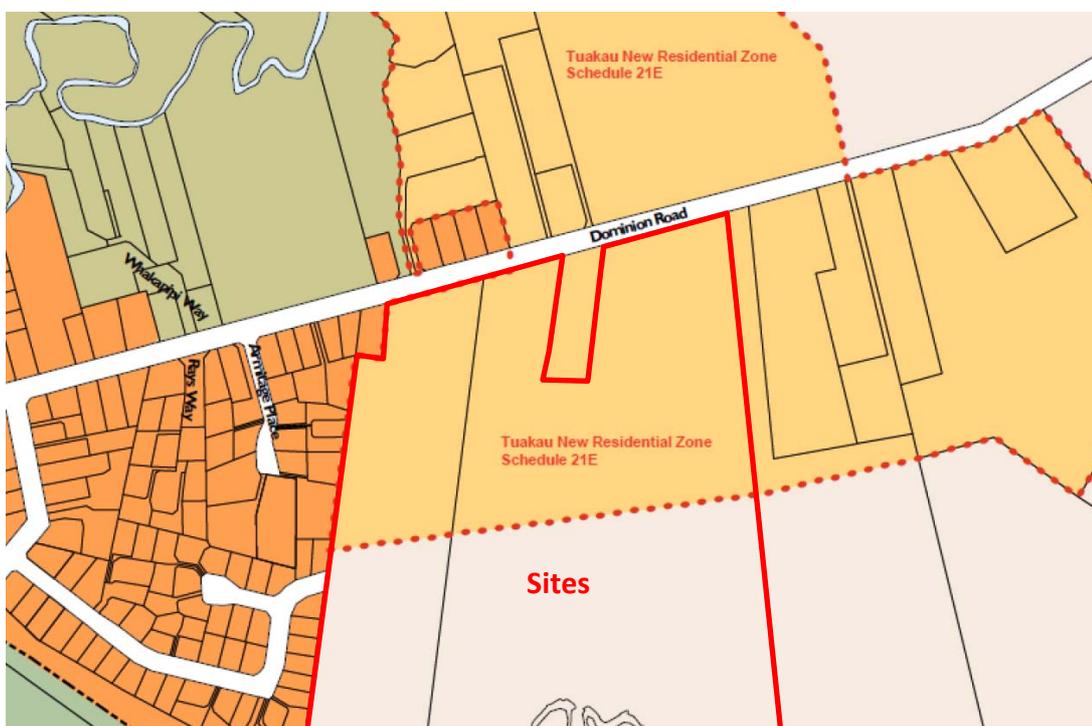
For the adjacent business zone rule 29.6.1 Noise states:

*No activity within the Zone shall cause the following sound levels to be exceeded, for the stated times, at or within the boundary of any other site, where that other site is:-*

1. Not Zoned Business Zone:

<b>Time/hours</b>	<b><math>L_{10}</math></b>	<b><math>L_{max}</math></b>
0700 to 1900	50dBA	75dBA
1900 to 2200	45dBA	75dBA
At all other times	40dBA	65dBA

Part C: Plan Change 16 Provisions rezones the northern part of the subject sites to residential as shown on Figure 3



**Figure 3. Proposed Rezoning by Plan Change 16**

Plan Change 16 sets the following noise limits for the Tuakau Living Zone Rules (New Residential)

*Rule 21E.18.1*

*Any activity is a permitted activity if it is designed and conducted so that noise from the activity measured at any other site does not exceed:*

- (a) 50dBA ( $L_{10}$ ), 7am to 7pm, Monday to Saturday, and

- (b) 45dBA ( $L_{10}$ ), 7pm to 10pm, Monday to Saturday, and
- (c) 40dBA ( $L_{10}$ ), and 65dBA ( $L_{max}$ ) all other times and public holidays.

*Despite the above, construction noise and emergency sirens are not subject to this rule.*

For the Tuakau Industrial Zone, Plan Change 16 sets

*Rule 24G.18.1*

*Any activity in the Tuakau Industrial Zone is a permitted activity if it is designed and conducted so that noise from the activity measured at any other site:*

(d) *in the Tuakau Industrial Zone, does not exceed:*

- (i) 75dBA ( $L_{10}$ ), 7am to 10pm
- (ii) 45dBA ( $L_{10}$ ), 10pm to 7am the following day
- (iii) 75dBA ( $L_{max}$ ), 10pm to 7am the following day, and

(e) *in another zone, does not exceed*

- (i) 55dBA ( $L_{10}$ ), 7am to 10pm
- (ii) 40dBA ( $L_{10}$ ), 10pm to 7am the following day
- (iii) 70dBA ( $L_{max}$ ), 10pm to 7am the following day.

*Despite the above, construction noise and emergency sirens are not subject to this rule.*

Based on the Operative District Plan the industrial activities located to the south of the proposed subdivision must comply with a level of 50dBA  $L_{10}$  during the daytime (7am – 7pm) and 45dBA  $L_{10}$  plus 75dBA  $L_{max}$  at night time (7pm – 7am). As set out in the rule, these levels must be complied with at or within the Rural Zone boundary.

For Plan Change 16 the industrial activities located to the south of the proposed subdivision must comply with a level of 55dBA  $L_{10}$  during the daytime (7am – 10pm) and 40dBA  $L_{10}$  plus 70dBA  $L_{max}$  at night time (10pm – 7am)

The report prepared by Marshall Day Acoustics entitled “Tuakau Structure Plan Acoustic Assessment” dated 1 September 2015 recommends the following noise levels for an Industrial Zone 2, which would be the zoning of the current Business Zone to the south of the subject sites.

1 Activities on a site within the zone shall not exceed the following noise limits within the boundary of any other site is:

a) Industrial 2 Zone

70 dB  $L_{Aeq}$

b) Residential, Residential 2, Rural-Residential, Village or within the notional boundary of any existing dwelling house as of 18 December 2008 in the Rural Zone (Note: the notional boundary is defined as 20 metres from any side of a dwelling house or the legal boundary where this is closer to the dwelling):

Area	The noise level measured within the boundary of a site within the area described in column 1 of this table shall not exceed the following limits:		
	0700 – 2200hrs	2200 – 0700hrs	
	dB $L_{Aeq}$	dB $L_{Aeq}$	dB $L_{Amax}$
High Background Noise Area (refer to planning maps)	55	45	75
All other areas	50	40	70

c) Business Zone:

0700 – 2200hrs	2200 – 0700hrs	
dB $L_{Aeq}$	dB $L_{Aeq}$	dB $L_{Amax}$
60	50	75

d) Light Industrial Zone

65dB  $L_{Aeq}$

2. Clause 1. Above does not apply to construction noise.
3. The noise levels shall be measured and assessed in accordance with the requirements of NZS 6801:2008 Measurement of Environmental Sound and NZS 6802:2008 Environmental Noise respectively,

In the Summary Statutory Report Plan Change 16 to the Waikato District Plan, Tuakau Structure Plan - Stage 1 (Residential and Industrial Rezoning) Notified 16 July 2016 it states”

*In determining the southern extent of the proposed New Residential Zone, Council has considered the recommended acoustic and air discharge buffer of approximately 250 - 300 metres measured from the northern boundary of the existing Business-zoned property owned by Fellrock Developments Limited and occupied by Tuakau Timber Treatment. However, as a result of community consultation which informed the adopted Tuakau Structure Plan, Council has determined that the buffer needs to be more extensive than that recommended in the expert reports.*

It is noted there is no evidence that a noise buffer is required. An earlier acoustic report adopted an air discharge recommendation of a 300m buffer but did not recommend any such buffer. The report from Marshal Day Acoustics (as set out above) has not recommended a buffer in the proposed noise limits. MDA have adopted a control that recommends residential sites and notional boundaries existing at 18 December 2008 although there is no indication where these sites are. It appears this may provide some relatively minor relief for the industrial zoned sites should this option be accepted although until a decision is made on the Proposed Plan Change the requirements of the Operative District Plan is also required to be adopted. That is, the control is at the boundary of the current rural zoning.

It is also noted the Tuakau Borough Council approved an application by Hicksons Timber Protection (N.Z.) Ltd to erect and operate a facility for the manufacture of timber treatment concentrate on a site at Bollard Road, Tuakau on 7<sup>th</sup> June 1988. That decision set the following noise condition:

*CORRECTED NOISE LEVELS AT THE BOUNDARY OF THE NEAREST AFFECTED SITES ZONED RESIDENTIAL OR RURAL*

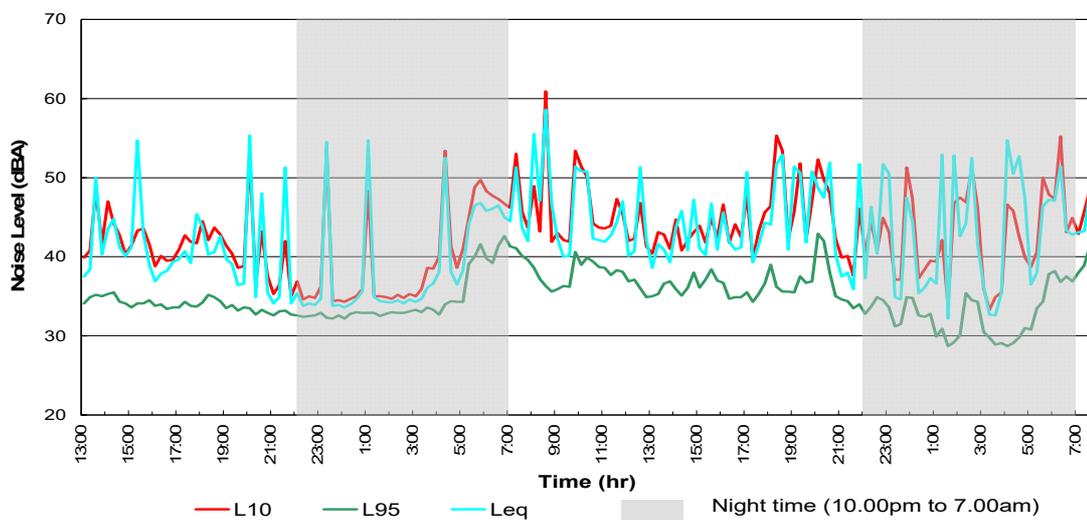
*Monday to Friday between the hours of 6.00am and 10.00pm and Saturday 6.00am to 12noon - 45dBA, or the background noise level plus 5dBA whichever is the greater.*

*At all other times including public holidays - 40dBA, or the background noise level plus 5dBA whichever is the greater.*

*Notwithstanding the noise standards referred to above, the Council reserves the powers conferred on it under the relevant sections of the Town and Country Planning Act 1977 and the Health Act 1956 to control any noise which has become an objectionable element.*

### 3 EXISTING NOISE ENVIRONMENT

To determine the existing noise environment field measurements were undertaken. The results of unattended measurements undertaken at the rear boundary of 52 Dominion Road (Site 1, Figure 1) in December 2008 are shown on Figure 4. The weather varied during the measurement period but was generally fine, cool and overcast. There were some showers during the final 3 – 4 hours of the measurements.



**Figure 4. Ambient Sound Measurements. Site 1**

From Figure 4 the background sound ( $L_{95}$ ) is typically in the mid 30dBA range during the night time (10.00pm to 7.00am) and in the low to mid 40dBA range during the day time. These levels suggest a moderate to low noise environment.

The higher  $L_{10}$  and  $L_{eq}$  spikes on the noise trace shown in Figure 4 correspond to noise from the passing trains as the measurement site is in the close proximity of the NIMT Railway. When excluding these spikes from the analysis it shows that during the day time the  $L_{10}$  level is typically in the mid 40dBA range and therefore similar to the 45dBA  $L_{10}$  criterion of the District Plan for residential zones (Rule 27.6.1.15). Based on the measurements, noise from the business zone to the south would comply with the 50dBA  $L_{10}$  criterion that the District Plan (Rule 29.6.1) would require if the site were zoned residential.

During the night time, the  $L_{10}$  level is typically in the mid 30dBA range. Again, this is consistent with a level of 35dBA  $L_{10}$  that the District Plan expects for residential zones and shows that the southern adjacent business sites would not result in a noise nuisance to the development.

In August 2016 further unattended field measurements were undertaken at site 2 (Figure 1) over a 36 hour period. These measurements gave a similar result as the 2008 survey.

Attended measurements were undertaken at sites 3 and 4 in fine, mild and calm conditions with the industrial sites operating. As for the monitoring at site 1, these sites were near the top of the bank and representative of the rear boundary of any potential residential site. The measured level with the mill operating was similar at both sites 3 and 4 with a  $L_{10}$  of 43 – 44dBA and the  $L_{eq}$  being within 1dBA of the  $L_{10}$  value at 42 – 43dBA. The background sound ( $L_{95}$ ) was typically 41dBA. There was a 500Hz tonal component to the mill noise that would attract a 5dBA penalty to the assessed noise although the noise was not present all of the time, such as a 30 minute break at the mill from around 10am. Taking this into account and as the mill stops work well before 10pm there would be a minimum of 2dBA adjustment for the averaging of the noise. Thus, the assessed noise from the mill would be typically 47dBA  $L_{10}$ .

The measured background level without the mill operating was 40dBA with the  $L_{10}$  at 42dBA, which was controlled by distant traffic noise. That is, the noise from the mill has little effect on the existing noise environment although due to the tonal component the noise from the mill can be clearly heard.

From these measurements the mill is complying with all of the various noise limits at the rear boundary of the proposed subdivision.

#### **4 EFFECTS OF INDUSTRIAL NOISE**

As set out in the operative District Plan, Tuakau Industrial Zone Plan Change 16 and the recommendations from Marshall Day Acoustics, a level of 50 – 55dBA  $L_{10} / L_{eq}$  is considered to be a reasonable level for any residential activity during the daytime. Based on field measurements the noise from the mill is well within these levels so it is not expected there would be adverse noise effects for any residential development in the area.

It would seem the mill does not operate at night time so noise is not a concern during this time. If the mill did start to operate at night time the original consent for the mill and all subsequent rules and recommendations are such that the level would be within a limit that would allow undisturbed sleep for any residential activities that may be developed at 48 and 52 Dominion Road.

From the above findings there would not be any reverse sensitivity effect should 48 and 52 Dominion Road be developed for residential purposes.

#### **5 CONCLUSIONS**

Based on field measurements the noise from the industrial site to the south of 48 and 52 Dominion Road is within the levels anticipated for residential zones by the existing and proposed District Plan noise rules. At the current noise level any residential development at 48 and 52 Dominion Road would not result in any reverse sensitivity effects. The noise received at 48 and 52 Dominion Road would be within a reasonable level for residential development without any special treatment to control the noise. As there will not be any adverse effects of noise at 48 and 52 Dominion Road, there is no reason why the proposed residential development should not be approved.

# Tuakau Air Quality Assessment

48 and 52 Dominion Road



# Tuakau Air Quality Assessment

48 and 52 Dominion Road

Client: Pacific Engineering Projects Ltd

ABN: N/A

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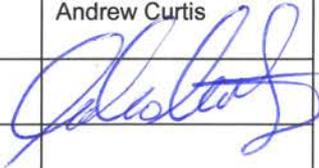
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## 1.0 Introduction

AECOM New Zealand Limited (AECOM) has been engaged by Pacific Engineering Projects Ltd (PEP) on behalf of the property owners of 48 and 52 Dominion Road Tuakau to prepare a report which assesses the potential air quality effects associated with local industry on this land, and the use of separation distances between industrial and residential zoned land, to control the potential for reverse sensitivity effects. This assessment will be used to support a submission on the proposed Tuakau Structure Plan Change 16 (PC16) to the Waikato District Plan. PC16 comprises of the rezoning of land around Tuakau for residential and industrial purposes to meet the growth demand, and is based on the 2014 Tuakau Structure Plan developed by the Waikato District Council.

## 2.0 Background Information

### 2.1 Site Location

The two properties at 48 (Lot 1 DP 485993) and 52 (Lot 2 DP 371796) Dominion Road (the sites), cover approximately 19 hectares of land. The sites are located approximately 800 m to the east of the Tuakau Town centre. The sites extend from Dominion Road to the north and slope to the south, towards the Bollard Road Industrial Zone. The properties are currently zoned as Rural under the Waikato District Plan. Land directly to the west of the sites is zoned Residential, some of which has houses still in the process of being constructed. The land to the north and east of the sites is zoned as Rural, and is mainly agricultural land with sporadic dwellings spread throughout.

The location of the sites is shown in Figure 1.

**Figure 1** General Site Location



Map Source: Open Street Map

## 2.2 Topography

The sites gently slopes south from Dominion Road toward the Bollard Road Industrial Zone. On the southern boundary of the sites the land drops to create a gully that separates the sites and the Bollard Road Industrial Zone. The gully comprises of pasture, scrub and a large stand of mature pine trees. The sites elevation is approximately 5 m above the Bollard Road Industrial Zone.

## 2.3 Bollard Road Industrial Zone

The Bollard Road Industrial Zone is directly to the south of the sites. The Bollard Road Industrial Zone is bordered by a railway line to the north and Whangarata Road to the south. Land directly south of the sites is zoned Business (coloured blue in the map below) and this zone is surrounded by Industrial zoning (coloured purple in the map below), with Bollard Road transecting the business park.

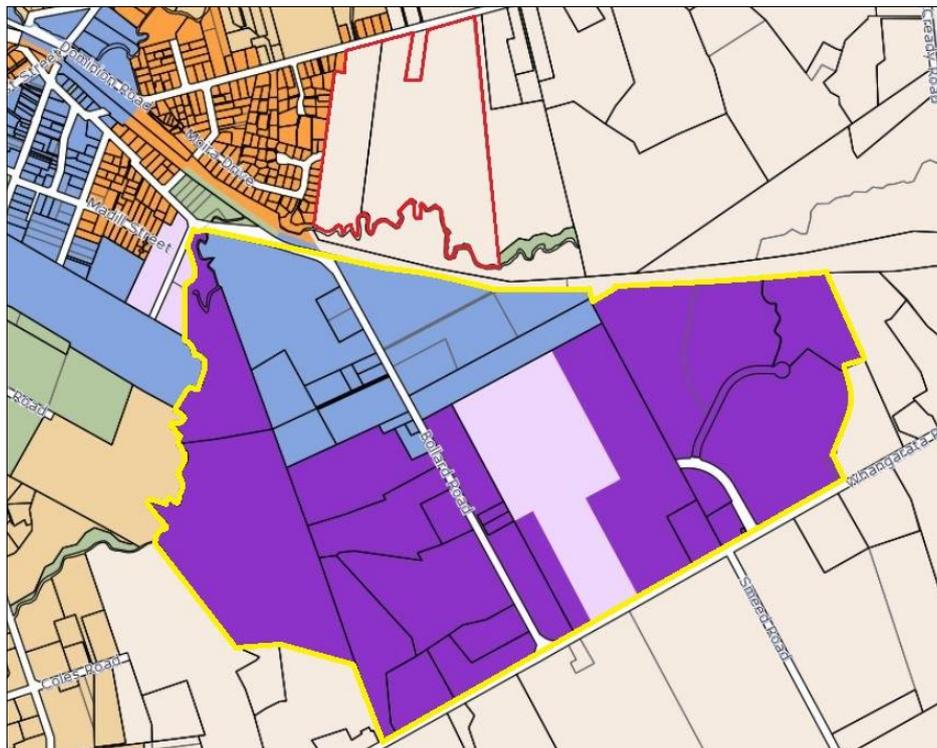
Within the Business and Industrial zoned land there are a number of industrial businesses; Dricon, Tuakau Grain, Fibreglass Tanks and Manufacturing Ltd, Tuakau Timber Treatment and Beams and Timber Direct Ltd (Tuakau Timber).

Currently industries that comply with the Waikato Regional Council Permitted Activity Rules can operate within the Business zone. This could include industries such as; vehicle maintenance, food manufacturing, milk processing, laundering and cleaning facilities. Within the Industrial zone, permitted, controlled and discretionary activities can operate. This could include industries such as; soap manufactures, fertiliser production, and galvanising plants.

Of the industries operating within the Bollard Road Industrial Zone, Dricon and Tuakau Grains have been identified as having resource consents to discharge air containing dust and/or odour. These industries would most likely have conditions imposed upon them, however in addition to these conditions the fundamental requirements of the Resource Management Act (RMA), Regional and District Plans; that no discharge whether odour or dust is objectionable to the extent that it causes an adverse effect at or beyond the boundary.

The current zoning of the sites and the surrounding area is shown in Figure 2. The sites are indicted by the red line; the yellow line indicates the Bollard Road Industrial Zone.

Figure 2 Current zoning around the sites



Map Source: Waikato District Council

## 2.4 Plan Change 16

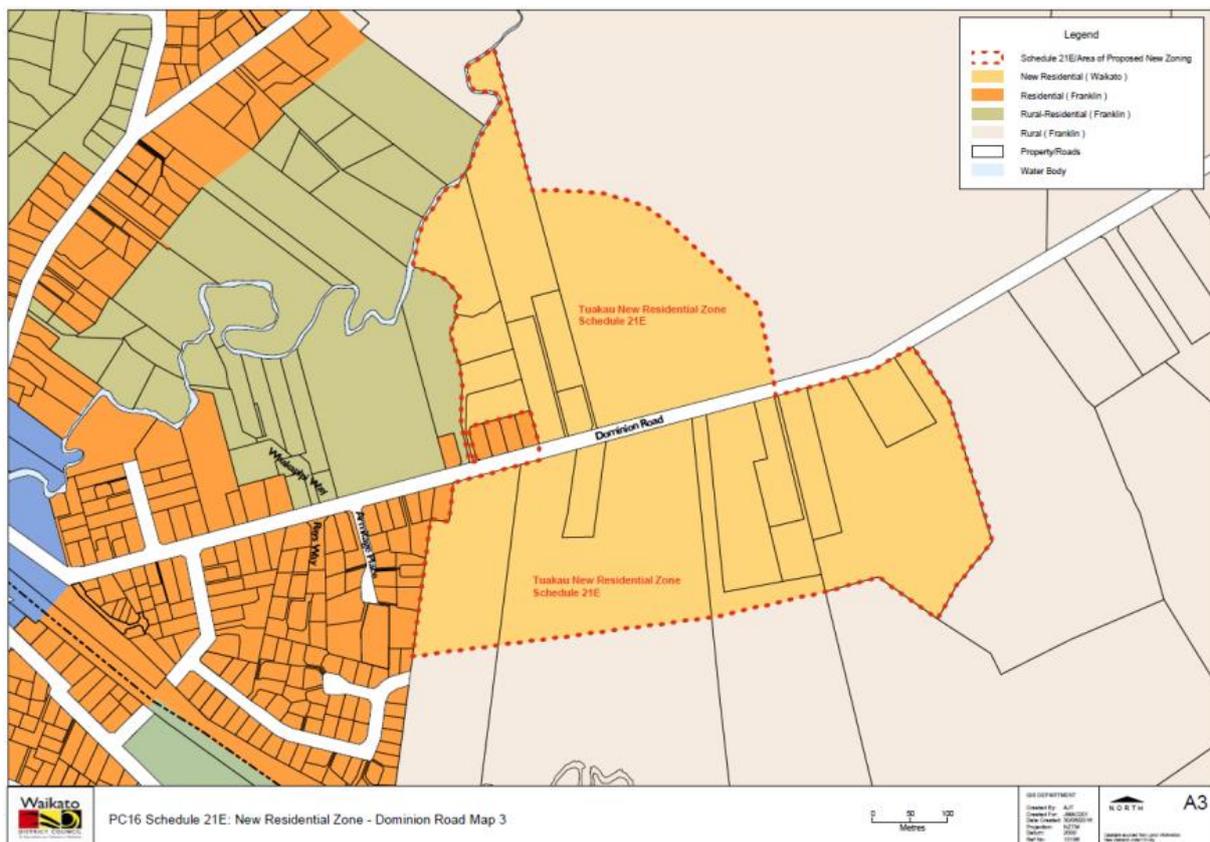
PC16 to the Waikato District Plan (WDP) seeks to change both the Franklin and Waikato Section of the WDP to cater for residential and industrial growth in Tuakau. The under lying document for PC16 is the TSP, which indicates the extent of the structure plan, intended zoning and how development is to be staged between 2016 to 2046.

During the development of this plan, WDC commissioned Tonkin and Taylor (T&T) to provide advice on the air quality effects and separation distance in regards to the TSP. T&T undertook a desktop assessment which considered the local industry, and researched literature both locally and internationally concerning the use of separation distances between industrial sites and residential dwellings. T&T identified a number of industrial sites within Tuakau that have the potential to discharge dust and/or odour. Using Australian guidelines, T&T applied separation distances to each of these industrial activities. Based on the desk top study T&T recommended a separation distance of 250 m around the Bollard Road Industrial Zone. The TSP and subsequently PC16 adopted this recommendation.

Figure 3 and 4 present the proposed zoning for Tuakau. This proposes that part of 48 and 52 Dominion Road would be rezoned from Rural to Residential. A separation zone of at least 300 m between the Bollard Road Industrial Zone and the proposed Residential Zone has been applied. This separation distances comprises of the railway corridor, the gully, and the southern section of the sites. This separation distance is significantly different to other proposed Residential Zones to the west of the existing Industrial Zone, which appears not to have any separation distance.

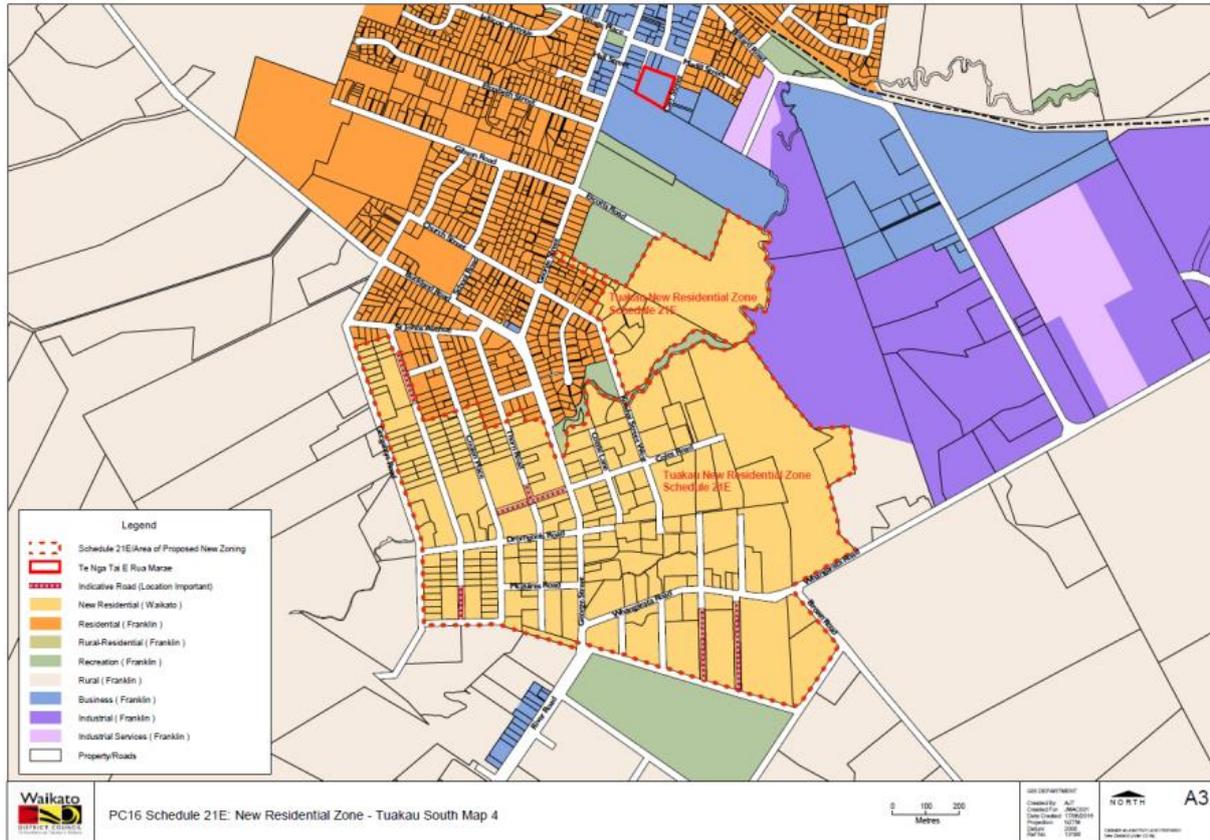
PC16 proposes that the existing Business zoned properties on Bollard Road are included into the industrial zone. This change does not increase the amount of industrial land available, as the existing Business Zone allowed for industrial use provided it was a permitted activity. Currently Tuakau Timber Treatment Limited and other smaller business operate in the Business Zone. This change means that activities that comply with the Waikato Regional Council Discretionary Activity Rules will be able to operate on this land.

Figure 3 Proposed Zoning for the Sites



Map Source: Waikato District Council

Figure 4 Proposed Zoning for Southern Tuakau



Map Source: Waikato District Council

## 2.5 Existing Separation Distances

Currently within Tuakau, industrial land use does not directly border residential land use. These land uses are separated by a combination of geological features (e.g. gullies), transport routes (roads and rail), and less sensitive land use (e.g. rural, business and light industrial). Under the current District Plan, there are a number of residential properties on Moira Road, Bollard Road and Madill Road that are around 120 to 130 m from land either zoned Business or Industrial in the Bollard Road Industrial Zone. In Figure 4 the proposed new Residential zone to the west of the Bollard Road Industrial Zone appears to be immediately adjacent to the industrial area. This proposed zoning seems to contradict the separation distance planned for the sites. Therefore there appears to be different standards being applied in different areas of Tuakau.

### 3.0 Assessment of Existing Environment

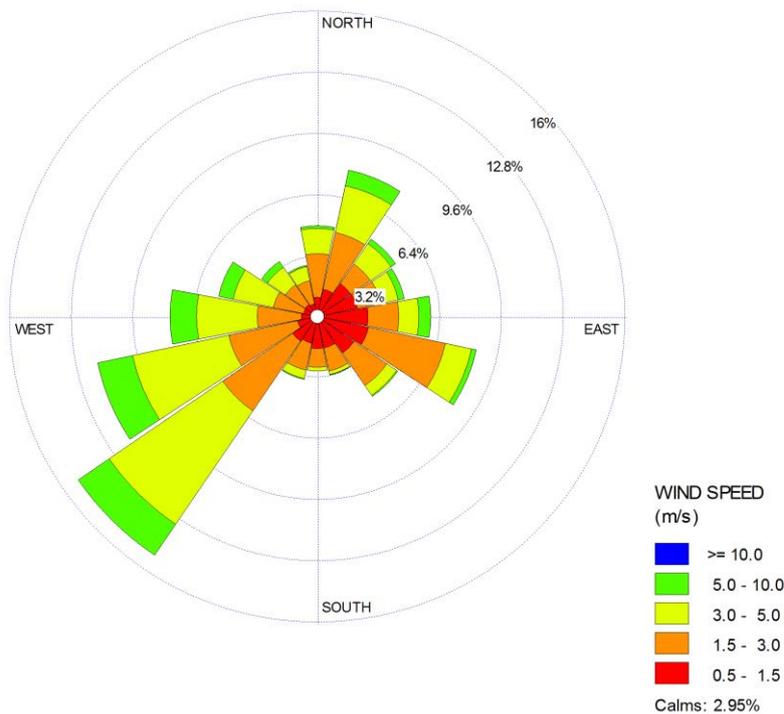
AECOM carried out site investigations to assess actual effects on the sites from the industrial area. The effects on the sites of odour and dust generated by existing activities in the Bollard Road Industrial Zone are discussed in the following sections.

#### 3.1 Local Meteorology

AECOM has reviewed local meteorological data from monitoring stations located close to the proposed site and has used this information to help understand the meteorological conditions in Tuakau. Data from the Pukekohe Weather Station was obtained from the National Institute of Water and Atmospheric Research (NIWA) CliFo data base, a web based system that provides access to New Zealand’s national climate database.

The Pukekohe Weather Station is located approximately 10 km northwest of the site, at UTM, Zone 60, 310438m E, 5880300m N. Analysis of the wind data at the Pukekohe Weather Station between 1 August 2013 and 31 July 2016 indicates that the predominant wind directions are from the southwest and west-southwest. Wind data from this station has been presented as a wind rose in Figure 5.

Figure 5 Pukekohe Meteorological Data for the period 1 August 2013 to 31 July 2016



Winds coming from the south-southeast to south would place the sites in a downwind location of the Bollard Road Industrial Zone. Based on the meteorological data, 6.2% of the wind comes from this direction, with no wind from that direction greater than 5 m/s, the wind speed that would be required to carry dust from the Bollard Road Industrial Zone towards the sites. Table 1 presents the distribution frequency of wind speed. The wind sensor at the Pukekohe Weather Station is at 10 m, therefore wind speed at ground level will be lower, due to surface friction effect reducing the wind speed with height decrease. Wind speed of 5 m/s at 10 m would equate to approximately 2.5 m/s at 0.5 m. This means our assessment with respect to wind speeds is conservative.

**Table 1 Wind Speed Frequency Distribution**

Direction	Wind Speed (m/s)		Total (%)
	0 - 5	>5	
North	4.6	0.1	4.8
North northeast	7.0	0.8	7.8
Northeast	4.7	0.3	4.9
East northeast	4.3	0.3	4.6
East	5.3	0.6	5.9
East southeast	8.2	0.2	8.5
Southeast	5.0	0.1	5.1
South southeast	3.1	0.0	3.2
South	2.9	0.0	2.9
South southwest	3.3	0.0	3.4
South west	13.1	1.9	15.1
West southwest	9.8	1.8	11.7
West	6.3	1.4	7.7
West northwest	4.5	0.8	5.2
Northwest	3.2	0.4	3.5
North northwest	2.7	0.1	2.8

## 3.2 Odour Observations

Odour observations were undertaken to provide an understanding of existing odours from around the Bollard Road Industrial Zone. Odour observations took place over five days and at different times, to account for different production cycles within in the industrial area and metrological conditions. The findings of the odour observations undertaken on 3, 4, 5, 8 and 9 August 2016 are presented in the following sections.

### 3.2.1 Methodology

The ambient odour monitoring methodology utilised in this study is a variation of the method described in the German Standard Verein Deutscher Ingenieure (VDI) 3940 "Determination of Odorants in Ambient Air by Field Inspections" (VDI Method). This is the method recommended in the Ministry for the Environment (MFE) Good Practice Guide for Assessing and Managing Odour in New Zealand and is commonly used in Australia and Europe for odour assessment.

### 3.2.2 Sampling

The modified method used by AECOM involved using a single 'field odour scout' to visit a selection of sites and sample the ambient air every 10 seconds for 10 minutes giving a total of 60 samples per location per day. The field odour scout recorded the intensity of the odour (according to a set intensity scale), the odour character (from a list of 40 various odour descriptors), the wind direction, the wind speed, any rainfall, and the time and date for every sample. The intensity scale and odour descriptors are those described in the MFE Good Practice Guide and are listed in Appendix A. The wind direction was determined and recorded by the field odour scout using a compass. Wind speed was recorded according to the Beaufort Force scale.

### 3.2.3 Field Odour Investigations

AECOM staff carried out site visits on 3, 4, 5, 8 and 9 August 2016. The weather conditions during the site visits are summarised in Table 2. The metrological conditions during the odour investigation were most conducive to detect odour effects, with winds generally below 3 m/s.

**Table 2 Summary of Weather Conditions**

Sampling Date	Wind Direction	Wind Speed	Wind Strength	Rain
3 August 2016	Northwest	0.3 – 3.5 m/s	Very Light – Moderate Breeze	None
4 August 2016	Northwest	0.4 – 2.3 m/s	Very Light – Gentle Breeze	Sporadic light rain
5 August 2016	Northwest - North	0.9 – 2.2 m/s	Very Light – Gentle Breeze	Sporadic light rain
8 August 2016	Northeast	0.1 – 1.5 m/s	Calm – Gentle Breeze	None
9 August 2016	Northeast - East	0.6 -3.0 m/s	Very Light – Moderate Breeze	None

### 3.2.4 Field Odour Investigation Locations

The field odour investigation was carried out at various upwind and downwind locations of the sites, sampling locations varied depending on wind direction. The location of the odour surveys are shown in Figures 6 and 7.

### 3.2.5 Industrial Activity Type

The industrial activities that operate within the Bollard Road Industrial Zone do not appear to have any seasonal or large production variations. Production rates should be steady throughout the year, therefore odours detected during the odour investigations should be similar to odours that would be detected during different times of the year.

Figure 6 Odour Survey Sampling Locations 3 to 5 August 2016



Figure 7 Odour Survey Sampling Locations 8 and 9 August 2016



### 3.3 Odours Observed

Odours at each site that were observed during the odour investigations are summarised in Figures 8 to 17. Generally the odours observed were either very weak or weak in intensity, and transient in nature. A distinct onion odour was observed at Site 5, based on the intensity scale, this was the most intense odour detected.

Figure 8 Site 1 Odour Observations

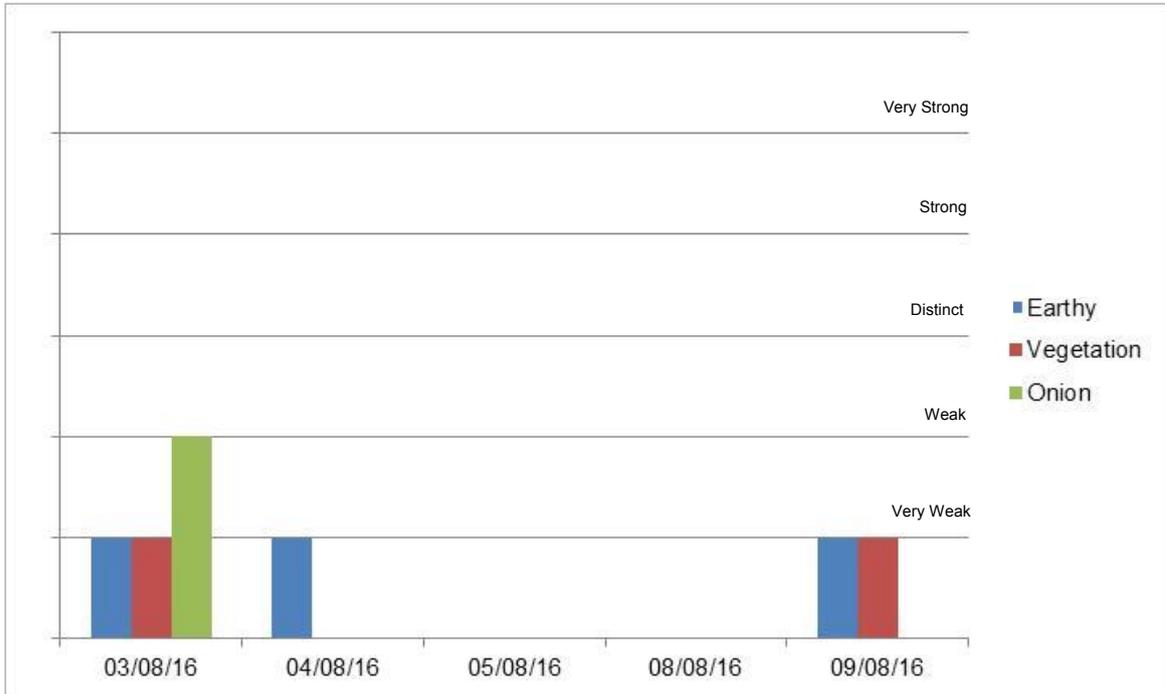


Figure 9 Site 2 Odour Observations

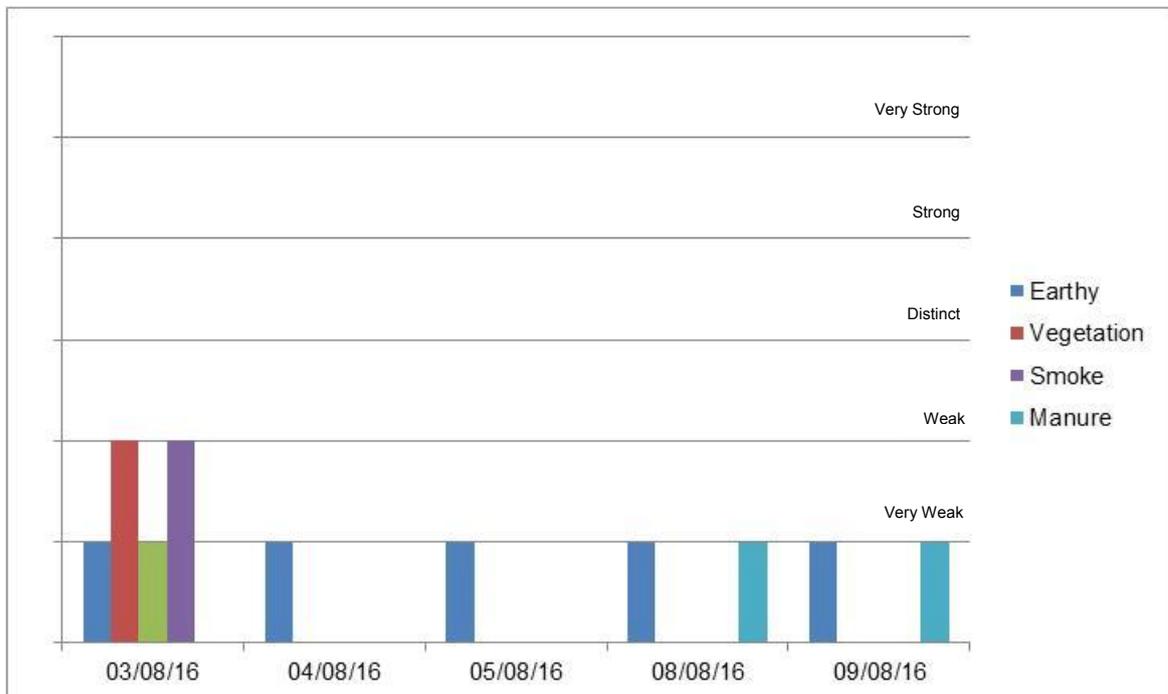


Figure 10 Site 3 Odour Observations

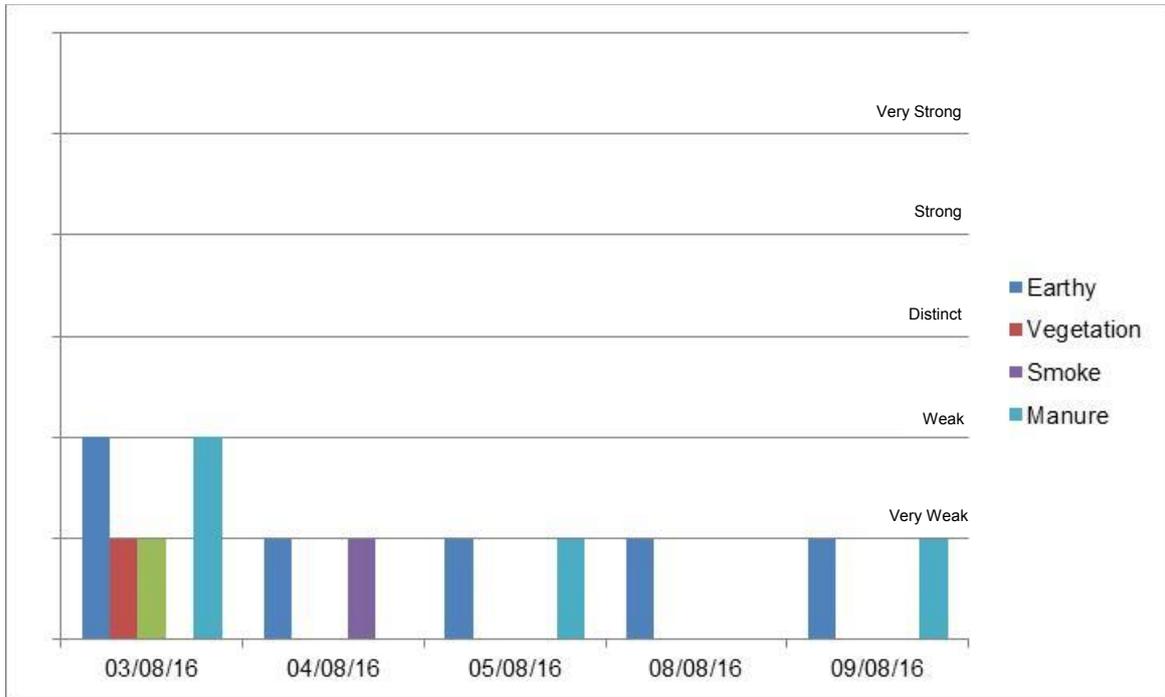


Figure 11 Site 4 Odour Observations

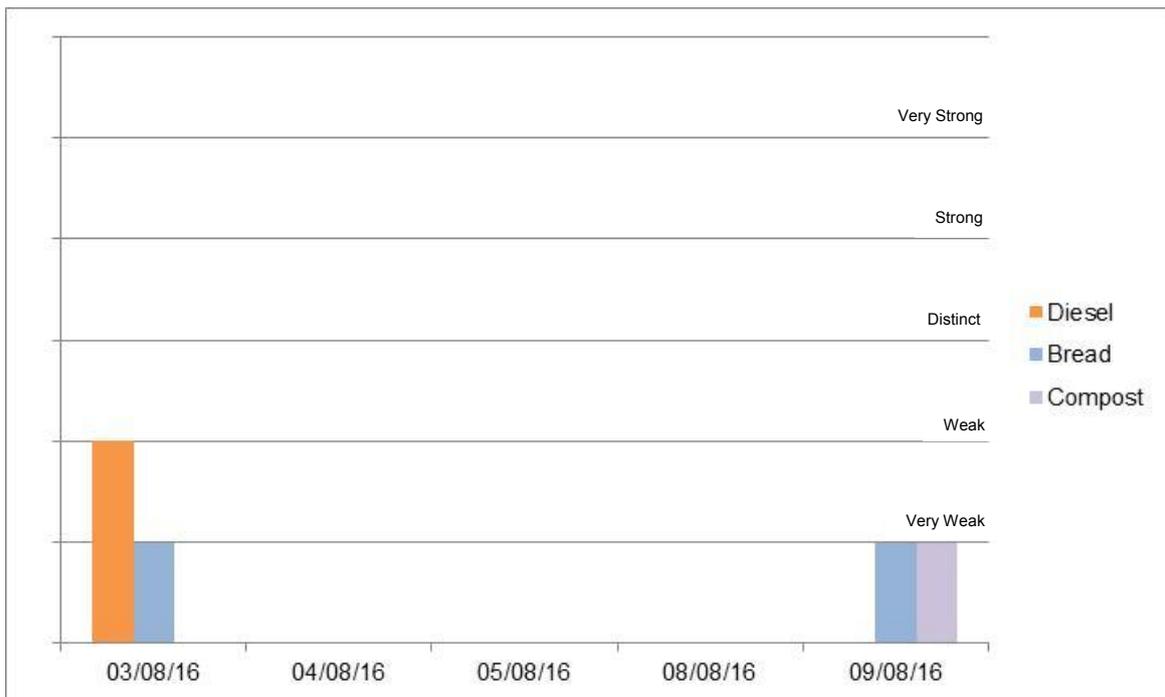


Figure 12 Site 5 Odour Observations

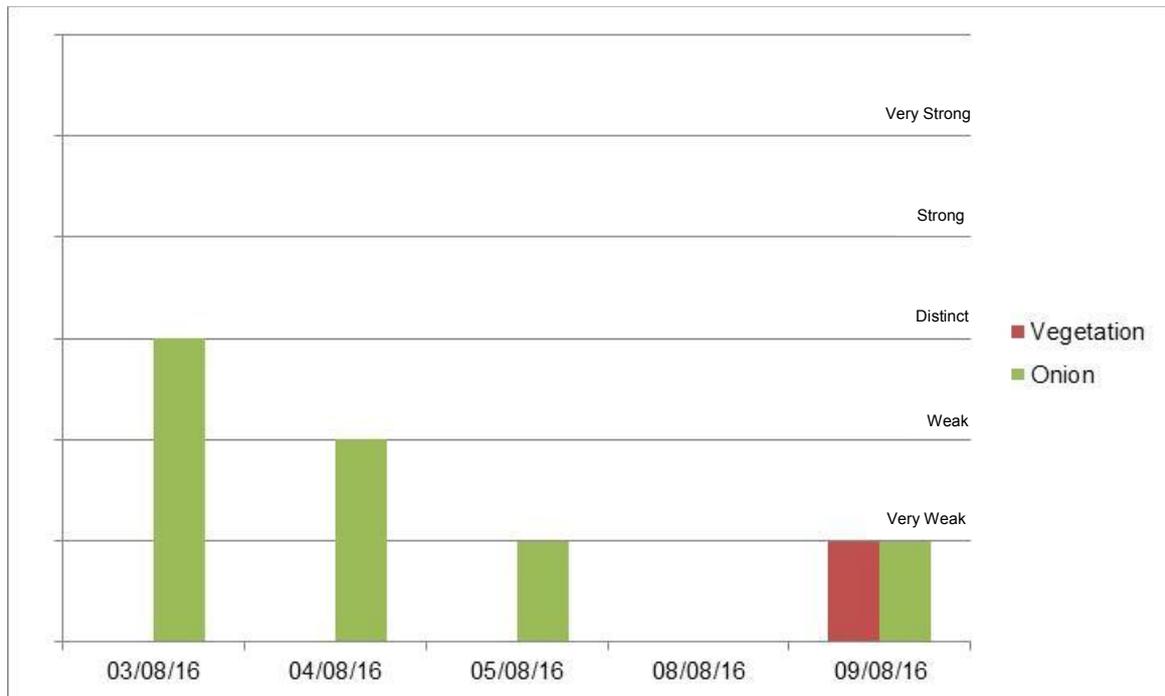


Figure 13 Site 6 Odour Observations

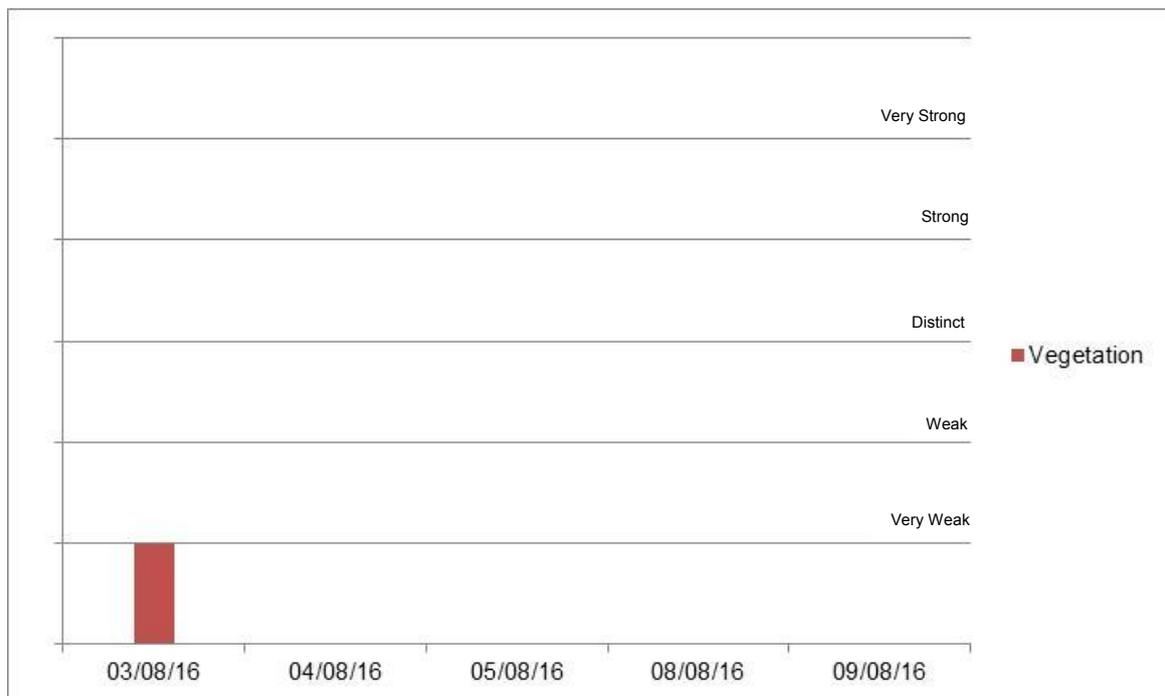


Figure 14 Site 7 Odour Observations

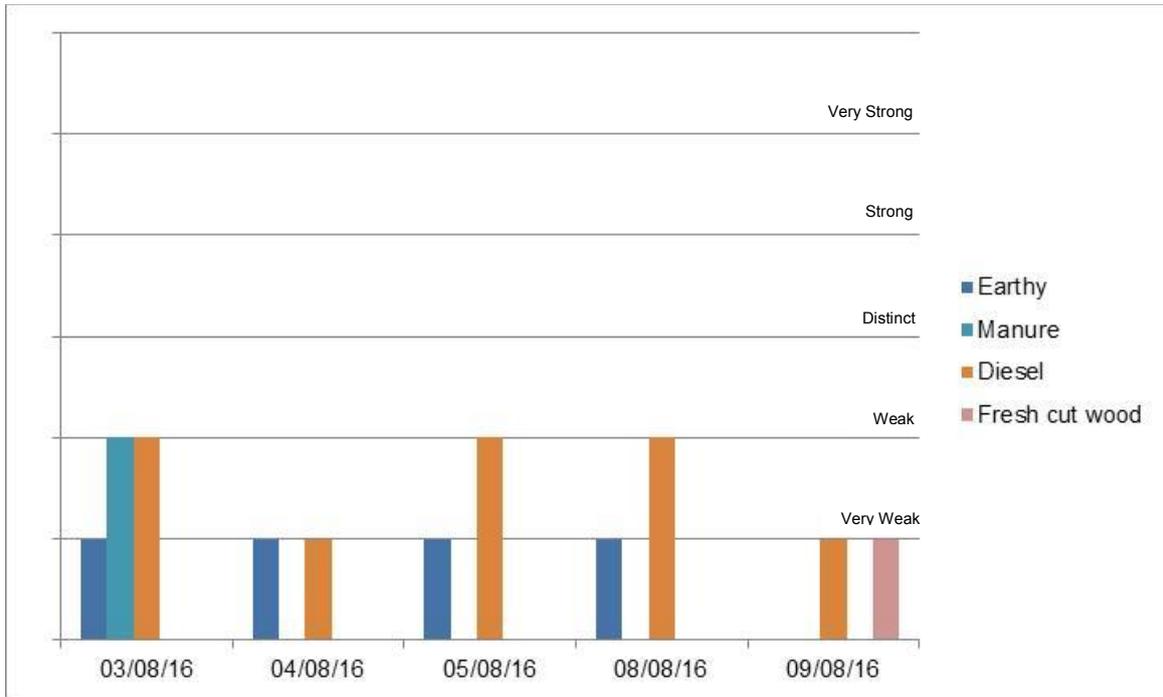


Figure 15 Site 8 Odour Observations

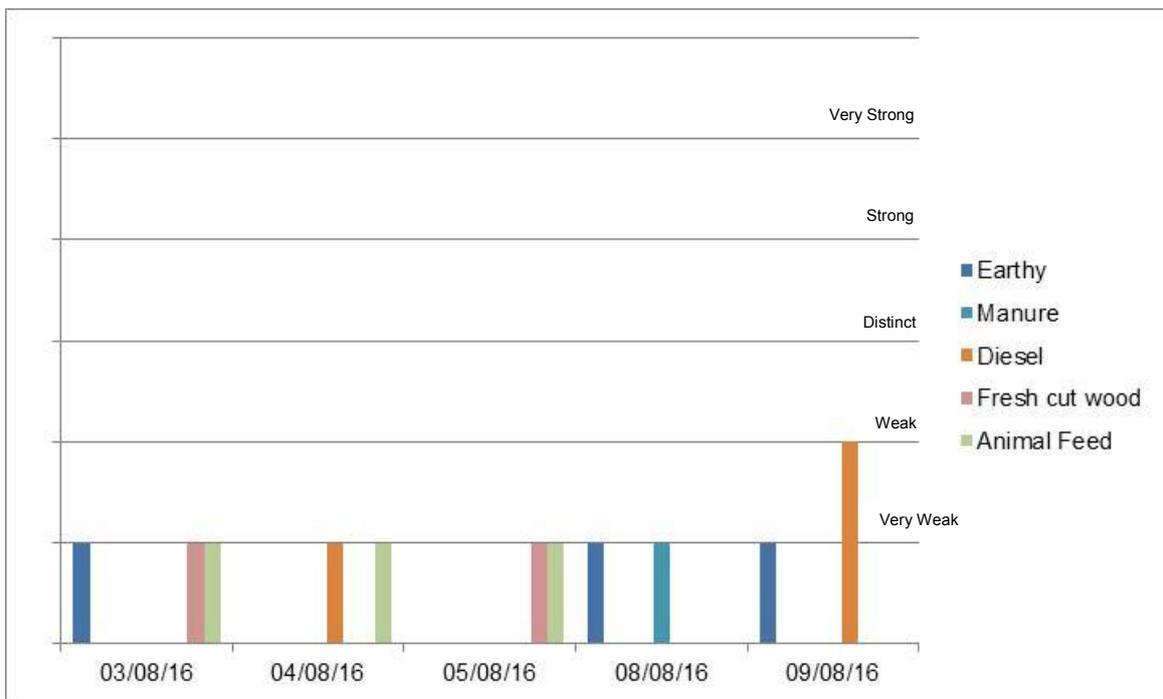


Figure 16 Site 9 Odour Observations

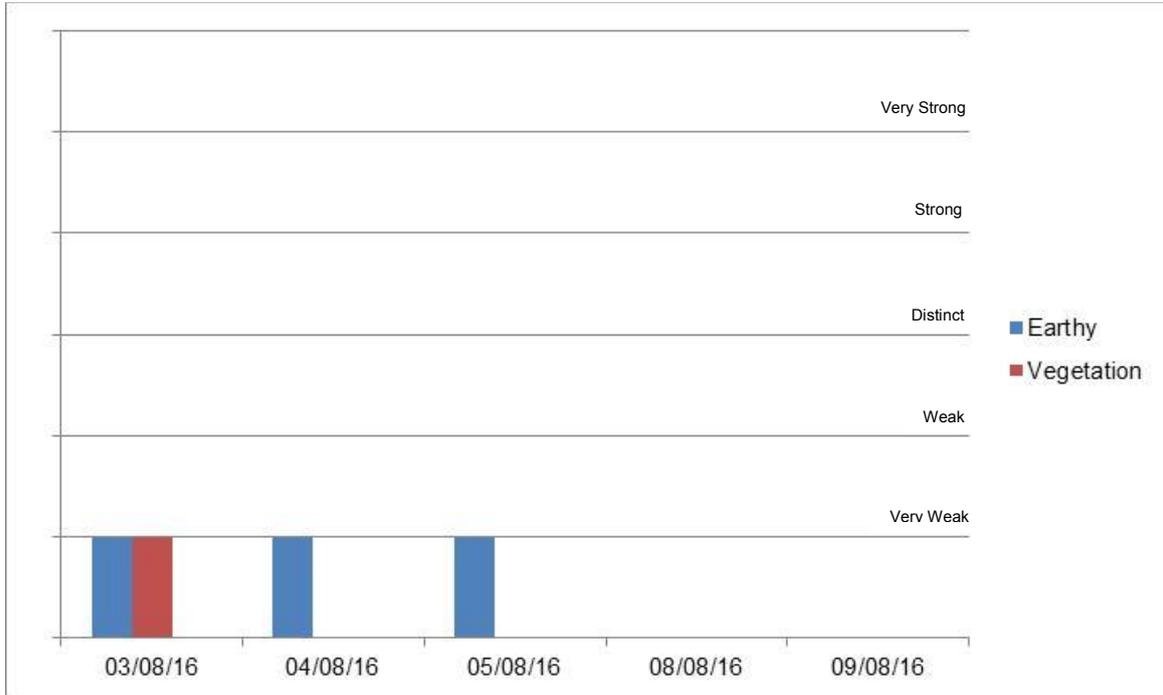
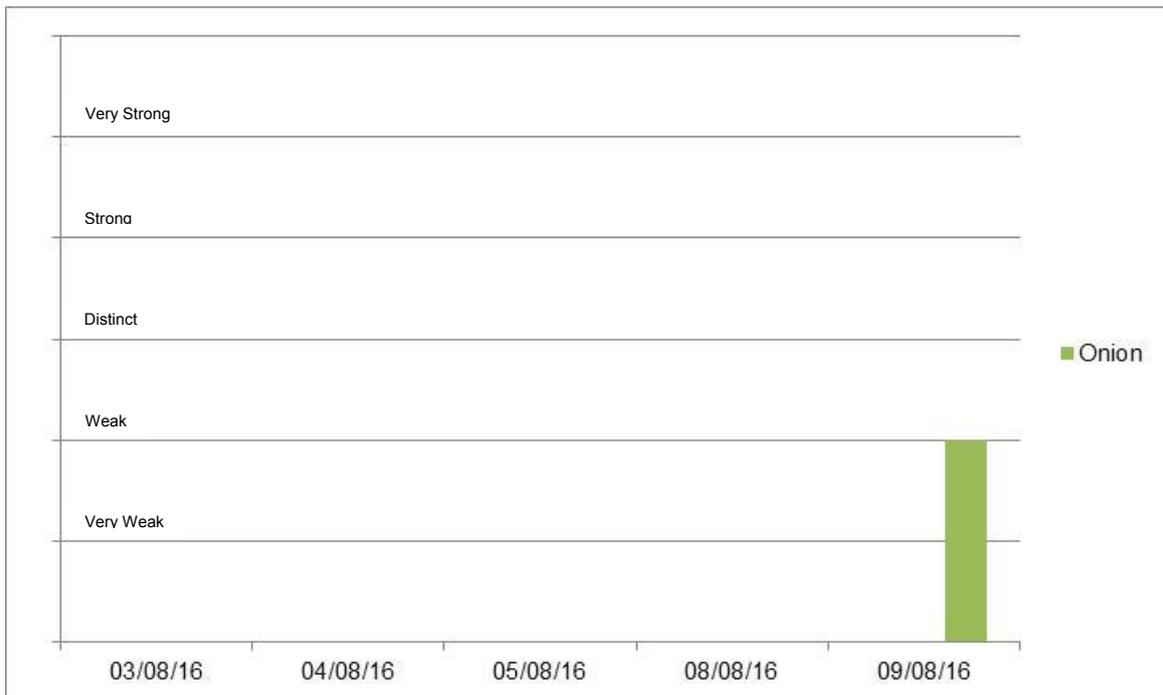


Figure 17 Site 10 Odour Observations



### 3.4 Summary of Odour Investigations

Based on our observations, odours that can be associated with the industrial zone, were typically described as fresh cut wood and animal feed (grain type odour). These odours can mostly likely be associated with the activity at Tuakau Grains and Tuakau Timber. When detected the odours were classified as being “very weak” and transient in nature, these odours were only observed downwind (approximately 200 m from the site), and within the industrial zone. During the odour survey, no odours were detected that might be considered offensive or objectionable.

Odours detected at the sites were generally described as earthy, vegetation, manure and smoke. The earthy, vegetation and manure type odours can be associated with the agricultural activities on the sites. The smoke odours can be attributed to the domestic home heating from residential properties on Dominion Road and Armitage Place. Other odours of interest that were experience during the survey were diesel and onion odours. The diesel odours were from passing traffic, mainly large trucks. Onions type odours were observed at the sites once, and routinely at Site 5. The origin of the onion type odour at the sites could not be identified, but a likely source could be onion weed. The onion odour at Site 5 can be attributed to the NZ Growers Ltd pack house on Tuakau Saleyards Road.

Even though no odours from the Bollard Road Industrial Zone were observed at the sites, this is due to unfavourable wind direction during the field visits. Observations downwind of the Bollard Road Industrial Zone at similar distances to that of the sites, had either no discernible odours or very weak and intermitted odours. Based on the field observation and considering the topography and the large stand of tree between the Bollard Road Industrial Zone and sites, it is highly unlikely any offensive or objectionable odour would be detected on the sites.

### 3.5 Dust Emissions

AECOM has reviewed existing industries and undertook site investigations of activities at the Bollard Road Industrial Zone, and consider the most significant source of dust is generated from vehicle movements on unsealed yards around the Tuakau Timber site. From the site investigations dust was observed within the site on dry days.

There are four main factors that are important to understand when determining whether any nuisance is caused by dust emissions from unsealed yards.

These are:

- Particle size;
- Particle density;
- Wind speed; and
- Wind direction.

These factors are all interrelated, and it is how they combine that determines the potential for an effect to occur.

In general, however, it is possible to make the following statements:

- Heavier and larger particles require more wind (speed) to become airborne;
- Large particles will deposit faster than small particles (of a similar density);
- More dense particles will deposit more rapidly than less dense particles (of a similar size); and
- Particles will travel further before depositing with a strong wind blowing than with a light wind blowing.

Despite this range of variables, the MfE Good Practice Guide<sup>1</sup> states that dust nuisance effects are generally only experienced within 300 m of unmitigated dust sources. As operations at Tuakau Timbers must comply with Waikato Regional Council’s Permitted Activity Rule it is not considered to have unmitigated dust discharges.

AECOM considers that the most common type of materials that has the potential to generate dust emissions from the Tuakau Timber site are soil, clay and gravel from unpaved surfaces. Figure 18 depicts the distance travelled by dust particles of these types of materials for a range of wind speeds.

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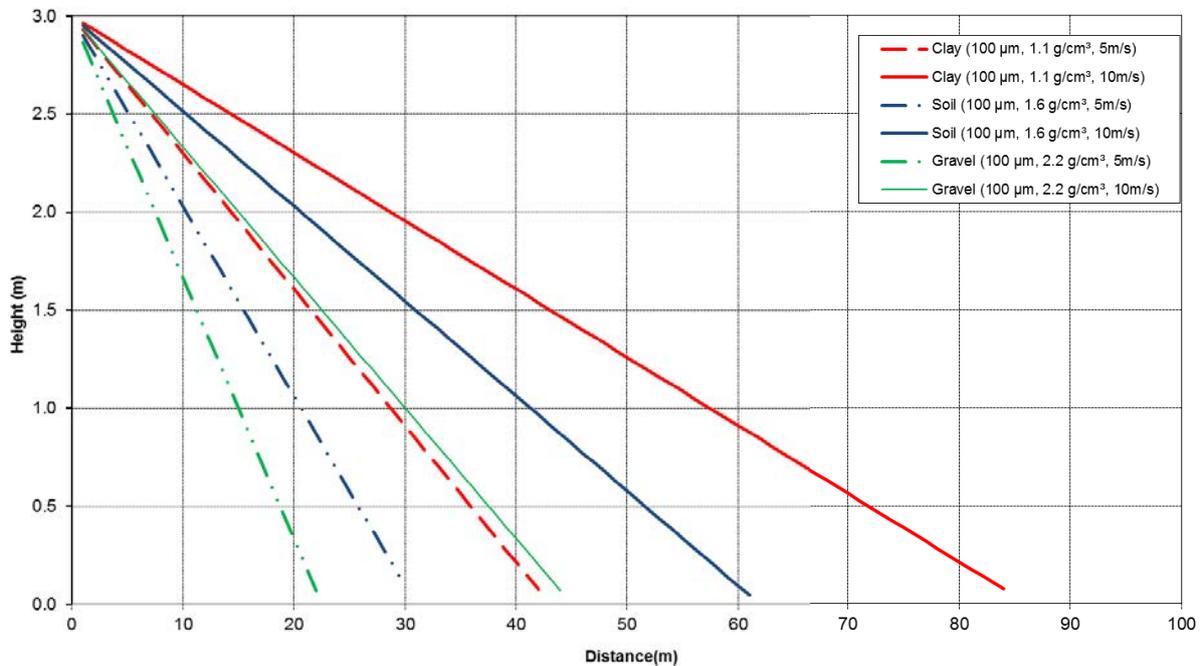
<sup>1</sup> MfE Good Practice Guide for Assessing and managing the environmental effects of dust emissions, September 2001.

Figure 18 shows that the density of the particle affects the distance it travels, with lighter particles travelling further than heavier ones. The density of clay, soil and gravel is 1.12, 1.6 and 2.2 g/cm<sup>3</sup>, respectively.

Typically nuisance dusts have a diameter of between 20 µm and 250 µm. In Figure 18 it has been assumed that the average particle diameter is 100 µm.

AECOM considers that there is some potential for dust affects within 84 m of Tuakau Timber during normal meteorological conditions (wind speeds ~5 m/s), if no form of mitigation is used. This value is based on flat land with no obstructions. However the sites are elevated by a gully and separated by a large stand of trees, therefore it is unlikely that the dust could travel this distance. Additionally metrological data indicates that there are typically very low wind speeds from the south-southeast and south direction that are strong enough to carry dust towards the sites, that exceed the required 5 m/s to carry dust. Coupled with the fact that the metrological data is at 10 m, wind speed would have to be between 9-10 m/s to reach 5 m/s at ground level. Also based on guidance provided in US EPA technical documents<sup>3</sup>, with mitigation in place it is likely that effects will only occur within 50 m of sources that are located at ground level.

Figure 18 Difference in Particle Travel with Wind Speed



<sup>2</sup> <http://www.aqua-calc.com/page/density-table/substance/Clay-coma-and-blank-dry-blank-excavated>

<sup>3</sup> AP 42, Fifth Edition, Volume I Chapter 13 Miscellaneous Sources, Section 2.4 - Aggregate Handling and Storage Piles

## 4.0 Separation Distances

### 4.1 Reasons for Separation Distances

Separation distances, also known as buffer zones, are a management tool to avoid conflict between industrial and sensitive land uses. These buffer zones are used to shield existing industrial activities from encroachment of sensitive activities and reverse sensitivity effects, and to reduce potential effects on sensitive activities from the encroachment of industry.

Separation distances are typically based on the consideration of typical emissions that may affect nearby sensitive land uses. These include:

- Dust;
- Odour;
- Combustion emissions; and,
- Other pollutants.

#### 4.1.1 Dust

Particulate matter in the environment generally falls into two categories: suspended and deposited particulate.

Suspended particulate matter is dust or aerosol which stays suspended in the atmosphere for significant periods of time. Its exact definition is dependent on the monitoring procedure adopted. The term Total Suspended Particulate is commonly used to describe the total amount of suspended particulate in the atmosphere at any one time.

Deposited particulate matter is dust or aerosol which because of its aerodynamic diameter and density, falls from the air. In general terms deposited particulate has a diameter of greater than about 10 or 20  $\mu\text{m}$ . It is generally associated with nuisance effects such as soiling.

Suspended and deposited particulate arise from many natural and man-made sources. The most important sources globally are volcanoes and wind-blown dust, whilst on a local level, stationary and mobile combustion sources, road dust, wind-blown soil, pollen, and emissions from industrial processes are important.

Section 15(1)(c) of the Resource Management Act 1991 (RMA) states that any discharge from an industrial or trade premise into air requires a Resource Consent unless that discharge is expressly allowed by a rule in a Proposed Regional Plan, Regional Plan, or a regulation.

Industries located within the Bollard Road Industrial Zone fall within the jurisdiction Waikato Regional Council and Waikato District Council. Some of the industries bordering the sites do not hold an air discharge consent, therefore onsite activities are covered by the Permitted Activity Rule 6.1.8(c), which for dust states:

*There shall be no discharge of particulate matter that is objectionable to the extent that it causes an adverse effect at or beyond the boundary of the subject property.*

For industries to comply with Regional and District rules, emission control equipment might need to be installed. During the site investigations, it was observed that Tuakau Timber, Tuakau Grains and Dricon used baghouses and cyclones to control dust emissions. AECOM does not have information regarding specifically to these sites, but based on past experience resource consents have specific conditions regarding the operation of emission control equipment. These conditions usually relate to regular maintenance schedules to avoid failures, and continual monitoring of these devices, so any failure is identified and appropriate action can be undertaken.

The rule of no objectionable dust at or beyond the property, applies to activities within the Bollard Road Industrial Zone regardless of the zoning of the adjoining land. Therefore any future industrial activities within the Bollard Road Industrial Zone, whether on an existing site or a new activity will also have to comply with this rule.

#### 4.1.2 Odour

Odour is defined by The Ministry for the Environment (MfE) as:

*“Odour is perceived by our brains in response to chemicals present in the air we breathe. Odour is the effect that those chemicals have upon us. Humans have sensitive senses of smell and they can detect odour even when chemicals are present in very low concentrations.*

*Most odours are a mixture of many chemicals that interact to produce what we detect as an odour. Fresh air is usually perceived as being air that contains no chemicals or contaminants that could cause harm, or air that smells “clean”. Fresh air may contain some odour, but these odours will usually be pleasant in character or below the human detection limit.*

*Different life experiences and natural variation in the population can result in different sensations and emotional responses by individuals to the same odorous compounds. Because the response to odour is synthesised in our brains, other senses such as sight and taste, and even our upbringing, can influence our perception of odour and whether we find it acceptable, objectionable or offensive.”*

The difficulty when assessing odours is the fact that the same odour has the potential to cause an effect that may be considered “acceptable”, “objectionable” or “offensive” depending on the context, of the sensitivity of the receiving environment and the person carrying out the assessment. An “objectionable” or “offensive” effect may occur where an odorous compound is present in a sample of air in very low concentrations, usually far less than the concentration that could cause adverse effects on the physical health of humans or impacts on any other part of the environment.

Typical odour effects reported by people include the following: nausea; headaches; retching; difficulty breathing; frustration; annoyance; depression, stress; tearfulness; reduced appetite; sleep deprivation; and embarrassment in front of visitors. Odour effects, such as those described above, contribute to a reduced quality of life for the individuals who are exposed to the odour.

Under the RMA, the main concern with odour is its ability to cause an effect that could be considered “objectionable” or “offensive” beyond the boundary of the sites. Whether an odour has an objectionable or offensive effect will depend on the factors described below and the decision as to whether an odour nuisance has occurred will depend on the judgement of the local authority who will investigate the potential for nuisance in response to complaints from the public.

Industries located within the Bollard Road Industrial Zone fall within the jurisdiction Waikato Regional Council and Waikato District Council. Even if industries operating within the Bollard Road Industrial Zone do not hold an air discharge consent, therefore onsite activities are covered by the ‘Permitted Activity Rule 6.1.8(b), which for odour states:

*There shall be no discharge of odour that is objectionable to the extent that it causes an adverse effect at or beyond the boundary of the subject property.*

Any future industrial activity to the Bollard Road Industrial Zone will also have to comply with this rule.

#### 4.1.3 Combustion emissions

Combustion products are those compounds that arise as a result of combustion processes. The most common combustion products are particulate matter with an aerodynamic diameter <10 µm (PM<sub>10</sub>), nitrogen oxides (NO<sub>x</sub>)<sup>4</sup>, carbon monoxide (CO), and sulphur dioxide (SO<sub>2</sub>). NO<sub>x</sub> and CO arise from virtually all combustion processes. SO<sub>2</sub> only occurs from those combustion processes where the fuel (e.g. diesel and coal) contains sulphur.

Combustion emissions are regulated through resource consents, and the National Environmental Standards (NES)<sup>5</sup>. The MfE promulgated the NES on 6 September 2004 as regulations under the Resource Management Act 1991. The NES standards apply to five air pollutants: nitrogen dioxide (NO<sub>2</sub>); CO; PM<sub>10</sub>; SO<sub>2</sub>; and ozone (O<sub>3</sub>). The MfE has also produced ambient air quality guidelines (NZAAQG)<sup>6</sup> for a similar list of contaminants for other averaging periods.

The NES standards for pollutants were primarily designed to ensure that air quality within a defined airshed is maintained at acceptable levels. AECOM has assessed the different industries within the Bollard Road Industrial Zone, and has identified a small number of sources, used on a small scale and relatively long distance away from the sites. Tuakau Timber operates a small boiler used to steam logs, this located approximately 350 m from the sites. AECOM has therefore concluded that emissions from combustion source to be insignificant and no further investigation is required.

Industries that produce emissions from combustion source within the Bollard Road Industrial Zone would have to comply with the Waikato Regional Council's air discharge rules 6.1.8(a) and 6.1.8(d):

*There shall be no discharge of contaminants beyond the boundary of the subject property that has adverse effects on human health, or the health of flora and fauna.*

*The discharge shall not significantly impair visibility beyond the boundary of the subject property.*

Any combustion process that does not comply with the Permitted Activity Rules would require consent, and further conditions would be imposed.

#### 4.1.4 Other Pollutants

There is a range of industrial processes that have the potential to be discharge into the air. These can include, but not limited to; volatile organic compounds (VOC), polycyclic aromatic hydrocarbon (PAH), dioxins, silica, acidic gases, ozone and asbestos. These substances have the potential to cause adverse health effects if not managed properly. Any future industry to the Bollard Road Industrial Zone will have to comply with the Waikato Regional Council's air discharge rule 6.1.8(a):

*There shall be no discharge of contaminants beyond the boundary of the subject property that has adverse effects on human health, or the health of flora and fauna.*

Most of the compounds list above would not comply with the Permitted Activity Rules and therefore would require consent with strict conditions.

## 4.2 Complaints from Existing Industry

AECOM contacted the Waikato Regional Council regarding any past air quality complaints that have arisen from the existing industrial activities at the Bollard Road Industrial Zone and the surrounding area. AECOM has found no evidence of complaints made to the Waikato Regional Council; therefore it can be assumed that there are minimal effects on air quality around the existing residential properties.

<sup>4</sup> Primarily a mixture of nitrogen oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).

<sup>5</sup> Ministry for the Environment, Resource Management (National Environmental Standards for Air Quality) Regulations, 2004

<sup>6</sup> Ministry for the Environment, Ambient Air Quality Guidelines (2002 update)

### 4.3 Separation Distances from other Jurisdictions

There is no buffer distance criteria promulgated by New Zealand regulatory authorities, other than the general requirements under the RMA. However some regulatory authorities and air quality consultants in New Zealand have adopted buffer distances set out by the South Australia Environmental Protection Authority (SA EPA), Environmental Protection Authority Victoria (EPA Vic), Western Australia Environmental Protection Authority (WA EPA) and the Tasmania EPA in the following documents:

- Guidelines for Separation Distances (SA EPA 2007)
- Environmental Protection Authority Victoria, Guideline, Recommended Separation Distances for Industrial Residual Air Emissions (EPA Victoria 2013)
- Guidance for the Assessment of Environmental Factors, Separation Distances between Industrial and Sensitive Land Uses (WA EPA, 2005)
- Attenuation Distances and Air Quality Code (Tasmania EPA, 2011)

Based on the industries in the Bollard Road Industrial Zone, AECOM has reviewed the above documents and considers the SA EPA and the EPA Vic guidelines to be the most appropriate for this situation. The SA EPA and the EPA Vic guidelines are summarised them in Table 3.

**Table 3 Separation Distances**

Industry	South Australia EPA	Victoria EPA
Cement Bagging	100 m	100 m
Grain Storage/Drying	100 m	250 m
Manufacture of Fibreglass Products	300 m	250 m
Sawmill	100 m	250 m
Timber Treatment	100 m	100 m

Based on the on the separation distance proposed by the SA EPA and the EPA Vic the sites is beyond the guidelines, with the exception of the EPA Vic sawmill distance of 250 m. The closest distance between the sites and Tuakau Timber is approximately 200 m, however the sawmill itself is approximately 350 m from the sites.

Future industries that operate out of the Bollard Road Industrial Zone might fall under difference categories, therefore have different separation distances from the above guidelines. AECOM has considered the potential type of industries that might occupy the Bollard Road Industrial Zone in the future, and have summarised them in Table 4 based on the above guidelines.

**Table 4 Separation Distance of Potential Industry in Tuakau**

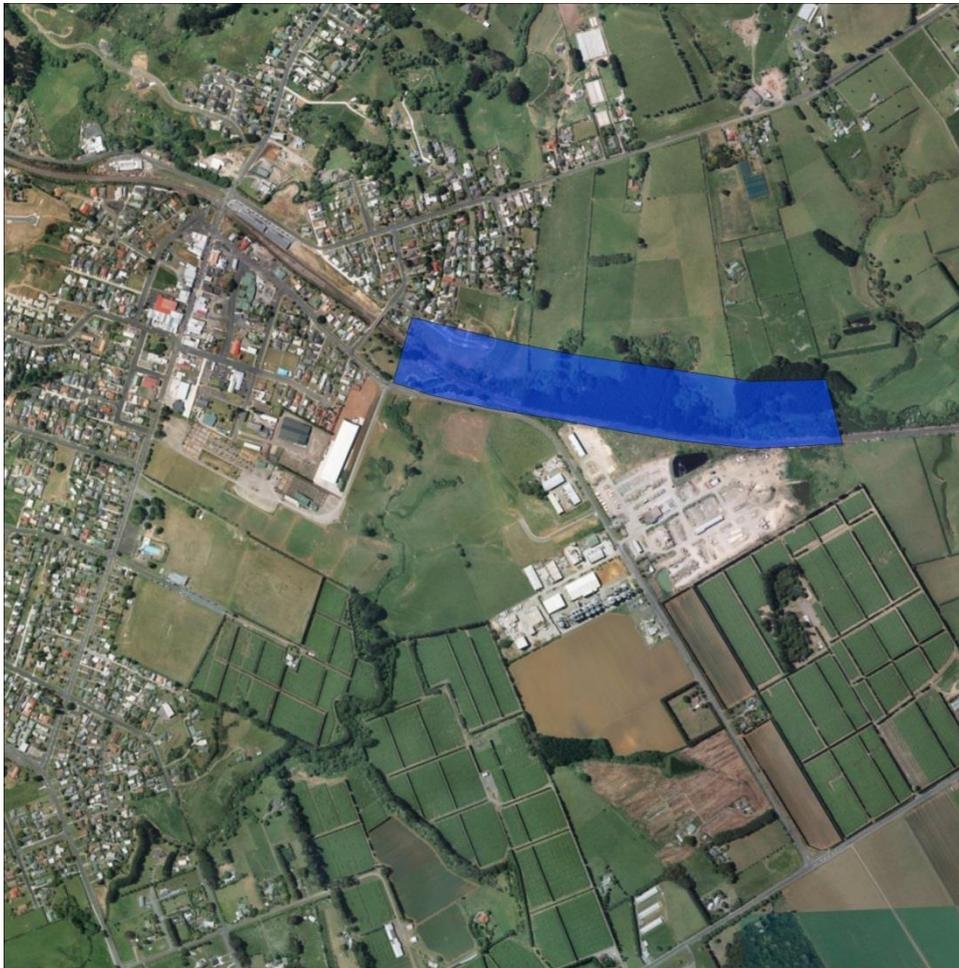
Industry	Typical Separation Distance
Food Manufacturing	100 – 300 m
Galvanising	100 m
Automotive spray painting	200 m
Chemical Processes	500 m
Fibre reinforced plastics manufacturing	300 m

The above are only guidelines, and in some instance the appropriate separation distance may vary from that recommended as a result of site specific operational or environmental conditions. These guidelines are based on the worst case emission, and don't take into account the use of good control measures. Even though New Zealand doesn't have guidelines specific to separation distances, the underlying requirements of the RMA, Regional and District Plans require that no discharge whether odour, dust or gaseous pollutant is objectionable to the extent that it causes an adverse effect at or beyond the boundary. This in effect protects the surrounding environments whether is sensitive or industrial. The above industrial activities would likely require a resource consent, which would limit any air pollutants to the site boundary, which would mean minimal off site effects.

#### 4.4 Recommend Separation Distance

AECOM considers that separation distances are an important tool to manager the future effects of industry on sensitive land uses, and control the potential for reverse sensitivity effects. Based on observations, investigations, and the potential for an uncontrolled discharge, AECOM considers a separation distance of 150 m distance, would protect future growth within the two proposed zones, and the effect of new housing on the current industrial clients of the Bollard Road Industrial Zone. AECOM's recommended separation distance is shown in Figure 19.

Figure 19 AECOM's Recommended Air Quality Buffer Zone



## 5.0 Summary

AECOM has investigated existing odour and dust at and around the sites to observe any effects from the Bollard Road Industrial Zone. AECOM has also assessed the potential for odour, dust and other air quality pollutants, current zoning and separation distances, other jurisdictions separation distance and what could the future industrial make of the Bollard Road Industrial Zone.

### Odour Observations

There was no objectionable or offensive odour detected at any stage of the odour survey. During the odour investigation the sites was never down wind of the sites, however sites downwind of the Bollard Road Industrial Zone that would be of a comparable distance to that of the sites either had no detectable odour or a very weak fresh cut wood or animal feed odour that was very transient in nature. The sites down wind of the Bollard Road Industrial Zone where odour was detect, had no obstruction in anyway, therefore it would highly likely that the sites would experience similar odours, possibly a reduction in odour as the mature stand of trees and natural gully would impede air flow to the sites.

### Dust Investigations

There was no objectionable dust observed at the sites during the site visits. During the site visits it was observed that the vehicles at Tuakau Timber created dust onsite during dry days due to unpaved surfaces. No other dust was observed on any other site. AECOM also undertook a desktop study of all the industries and deem dust from the unpaved surfaces at Tuakau Timber to be the only significant source of dust that had the potential to affect the sites. Based on the assumed make-up of the substrate, with wind speeds of 5 m/s there is a possibility that the dust could travel 84 m based on particle settling velocities. This is a conservative figure as the calculation is based on flat terrain; it does not take into account that the sites are elevated above the Bollard Road Industrial Zone and the stand of mature trees which would impede air flow.

### Metrological Data

Winds coming from the south-southeast and south would place the sites in a downwind location of the Bollard Road Industrial Zone. From the meteorological data, 6.2% of the wind comes from this direction, with no wind from that direction is greater than 5 m/s. Due to the low frequency of winds from this direction, coupled with low wind speeds from this direction, the likely hood of dust and odour reaching the site is low.

### Future use of Industrial Land

As well as assessing the current situation in and around the Bollard Road Industrial Zone, AECOM has also considered the future growth within the Bollard Road Industrial Zone. Even though it is hard to predict what industries might occupy the Bollard Road Industrial Zone in the future, any future industries will need to comply with the underlying requirements of the RMA, Regional and District Plans that no discharge whether odour, dust or gaseous is objectionable to the extent that it causes an adverse effect at or beyond the boundary. .

### Recommended Separation Zone

Following the review of all the information AECOM considers 150 m separation distance between the sites and the Bollard Road Industrial Zone appropriate, rather than the 300 m proposed in PC16. AECOM's proposed separation distance is also consistent with the current separation distances between existing residences. Considering that under PC16 there is no separation distance between the proposed residential properties and the western boundary of the Bollard Road Industrial Zone, this proposed zoning seems to contradict the separation distance planned for the sites.

## 6.0 Limitations

AECOM New Zealand Limited (AECOM) has prepared this Assessment of Environmental Effects Report in accordance with the usual care and thoroughness of the consulting profession for Pacific Engineering Projects Limited for use in submission on the proposed Tuakau Structure Plan Change undertaken at 48 and 52 Dominion Road Tuakau.

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# Appendix A

Odour Character Descriptors			
1	Fragrant	21	Like blood, raw meat
2	Perfumy	22	Rubbish
3	Sweet	23	Compost
4	Fruity	24	Silage
5	Bakery (fresh bread)	25	Sickening
6	Coffee-like	26	Musty, earthy, mouldy
7	Spicy	27	Sharp, pungent, acid
8	Meaty (cooked, good)	28	Metallic
9	Sea/marine	29	Tar-like
10	Herbal, green, cut grass	30	Oily, fatty
11	Bark-like, birch bark	31	Like gasoline, solvent
12	Woody, resinous	32	Fishy
13	Medicinal	33	Putrid, foul, decayed
14	Burnt, smoky	34	Paint-like
15	Soapy	35	Rancid
16	Garlic, onion	36	Sulphidic
17	Cooked vegetables	37	Dead animal
18	Chemical	38	Faecal (like manure)
19	Etherish, anaesthetic	39	Sewer odour
20	Sour, acrid, vinegar	40	Other

Intensity Level	Odour Intensity
0	No odour
1	Very Weak
2	Weak
3	Distinct
4	Strong
5	Very strong
6	Extremely Strong