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Attention: Emma MacDonald

Dear Emma

## **Drury Metropolitan Centre Plan Change - Assessment of Air Quality Impacts**

### **1 Introduction**

Kiwi Property Group Limited (Kiwi) is seeking a Private Plan Change (herein referred to as the “Drury Metropolitan Centre Plan Change” or the “Plan Change”) to the Auckland Unitary Plan to allow the development of a new metropolitan centre and surrounding land uses at Flanagan Road, Drury.

Tonkin and Taylor Ltd (T+T) has been engaged by Kiwi<sup>1</sup> to provide an assessment of potential air quality impacts to inform the Drury Metropolitan Centre Plan Change.

The following document summarises our assessment and findings, including:

- A summary of the environmental setting of the development with respect to air quality, including identification of local discharges to air.
- A description of our understanding of the Plan Change and the sensitivity of prospective land use activities in the Plan Change area to degraded air quality.
- An assessment of the potential impacts of the introduction of discharges to air to the Plan Change area on local air quality.
- An assessment of the potential impacts of adjacent discharges to air on activities proposed to be introduced to the Plan Change area.
- Summary conclusions of the assessment.

### **2 Environmental setting**

#### **2.1 Site**

The Plan Change area is illustrated in Figure 1 below. The Plan Change area is approximately 95 hectares (ha) and is located to the south of the existing Drury Local Centre and Light Industrial area on Great South Road. The Plan Change area has frontage to Fitzgerald Road to the east, Brookfield Road to the south, Flanagan Road to west, and Waihoehoe Road to the north.

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<sup>1</sup> As Kiwi Property Holdings No. 2 Limited (refer agreement dated 12 July 2018)

The subject sites are primarily used for farming, with some residential activity. Kiwi currently own 52 ha of land within the Plan Change area as shown in blue outline in Figure 1. All other properties within the wider Plan Change area are owned by various parties.

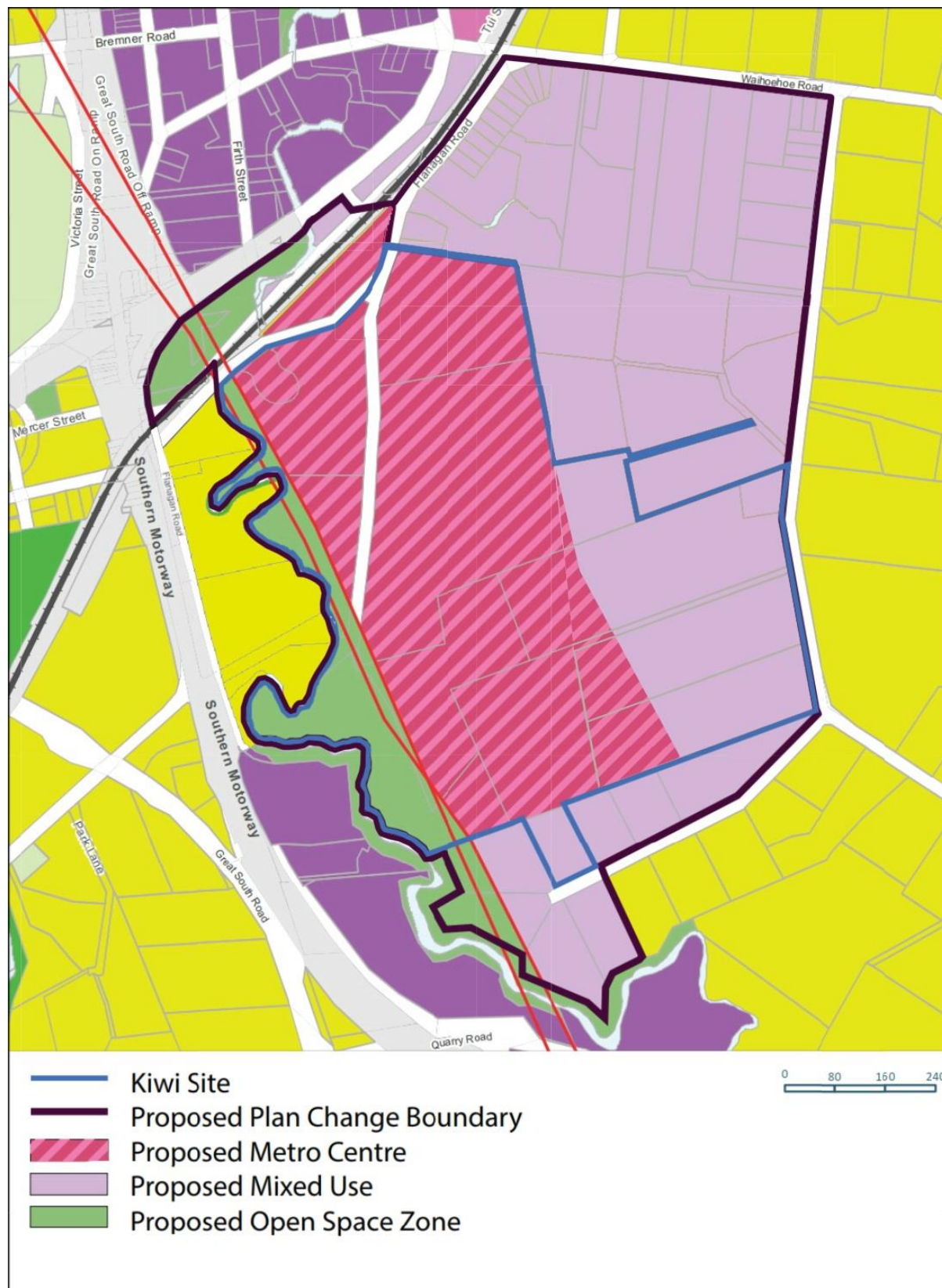


Figure 1: Plan Change area and proposed zoning

The site is situated in close proximity to Great South Road and State Highway 1, currently accessible via Waihoehoe Road at the northern end of Flanagan Road. The interchange provides northern and southern on and off-ramps to State Highway 1. The railway line is located to the immediate north of the site, however there is currently no train station servicing Drury.

The overall topography of the area is undulating, with several elevated ridgelines. The western extent of the Plan Change area is traversed by the Hingaia Creek, which forms part of an interconnected storm water catchment which eventually drains into Drury Creek, which is an estuary of the Pahurehure Inlet and Manukau harbour.

The Plan Change area is currently zoned Future Urban under the Auckland Unitary Plan. Kiwi are seeking to rezone the land to a mix of Metropolitan Centre, Mixed Use, and Open Space – Informal Recreation.

## 2.2 Local discharges to air and existing air quality

Sources of contaminant emissions to air in the surrounding area include:

- The Southern Motorway (SH1), which runs to the west of the subject land. Vehicle movements of approximately 48,000 vehicles per day<sup>2</sup> emit combustion contaminants and particulate matter to air.
- Activities within the Light Industry Zone and Mixed Use Zone areas to the northwest of the subject land, which can emit various contaminants to air. Existing activities involving discharges to air include a coffee roasting operation, vehicle servicing and timber retail.
- Similar industrial and commercial discharges that could potentially locate in the Drury South Light Industry Zone to the south and southwest of the development in future as this zone is developed. An existing chicken hatchery is located within this zone, across the Hingaia Stream to the southwest of the Plan Change area. Although intensive poultry farming operations are often associated with odour, minimal odour is typically emitted from hatchery operations.
- Market gardens in the area, which can feature horticultural spraying and winter heating combustion discharges.
- Pasture in the area may feature agricultural discharges (e.g. effluent irrigation or silage distribution) and occasional outdoor burning. Agricultural activities are likely to be phased out as urban development proceeds.
- Watercare Services Ltd (WSL) proposes to install a wastewater pump station adjacent to the existing Drury water pump station at Flanagan Road at the north end of the Plan Change area (within the existing WSL designation for the water pump station). The pump station will receive waste from a gravity main running from a discharge manhole at the corner of Brookfield Road and Fitzgerald Road at the southeast corner of the Plan Change Area north along Fitzgerald Road and approximately along the northern boundary of the Plan Change Area to Flanagan Road. From the proposed pump station a rising main will exit the Plan Change area to the east before heading north towards WSL's treatment plant at Mangere. The use of wastewater reticulation infrastructure proposed by WSL to service the Plan Change area and neighbouring developments may result in the discharge of odour. In particular, odour emissions are most likely to occur from the proposed pump station at Flanagan Road and rising main air vents such as at a discharge manhole proposed to be constructed at the corner of Brookfield Road and Fitzgerald Road.

<sup>2</sup> Based on NZ Transport Agency observational annual average daily traffic data for the SH1 Drury section, 2015

Overall there is a limited number of emission sources in the mainly rural environment surrounding the subject area with the main emission sources being vehicles on SH1 and discharges from the commercial/industrial area to the north (and to the south as the Drury South Light Industry Zone is developed).

Except in close proximity to these sources, existing air quality in the area is likely to feature generally low pollutant levels with occasional peaks in particulate levels when outdoor burning occurs in the area.

### 2.3 Meteorological conditions

Meteorological conditions provide a significant influence on the dispersion of air pollutants and the potential for air quality impacts.

A wind rose analysis of winds measured at the Pukekohe Electronic Weather Station, 13 km to the southwest of the development location is presented in Figure 2. Wind patterns in the local area are likely to be broadly similar to the pattern illustrated in Figure 2. As with most locations in the Auckland area, there is likely to be a strong prevalence for wind from the southwest and a secondary prevalence of winds from the northeast.

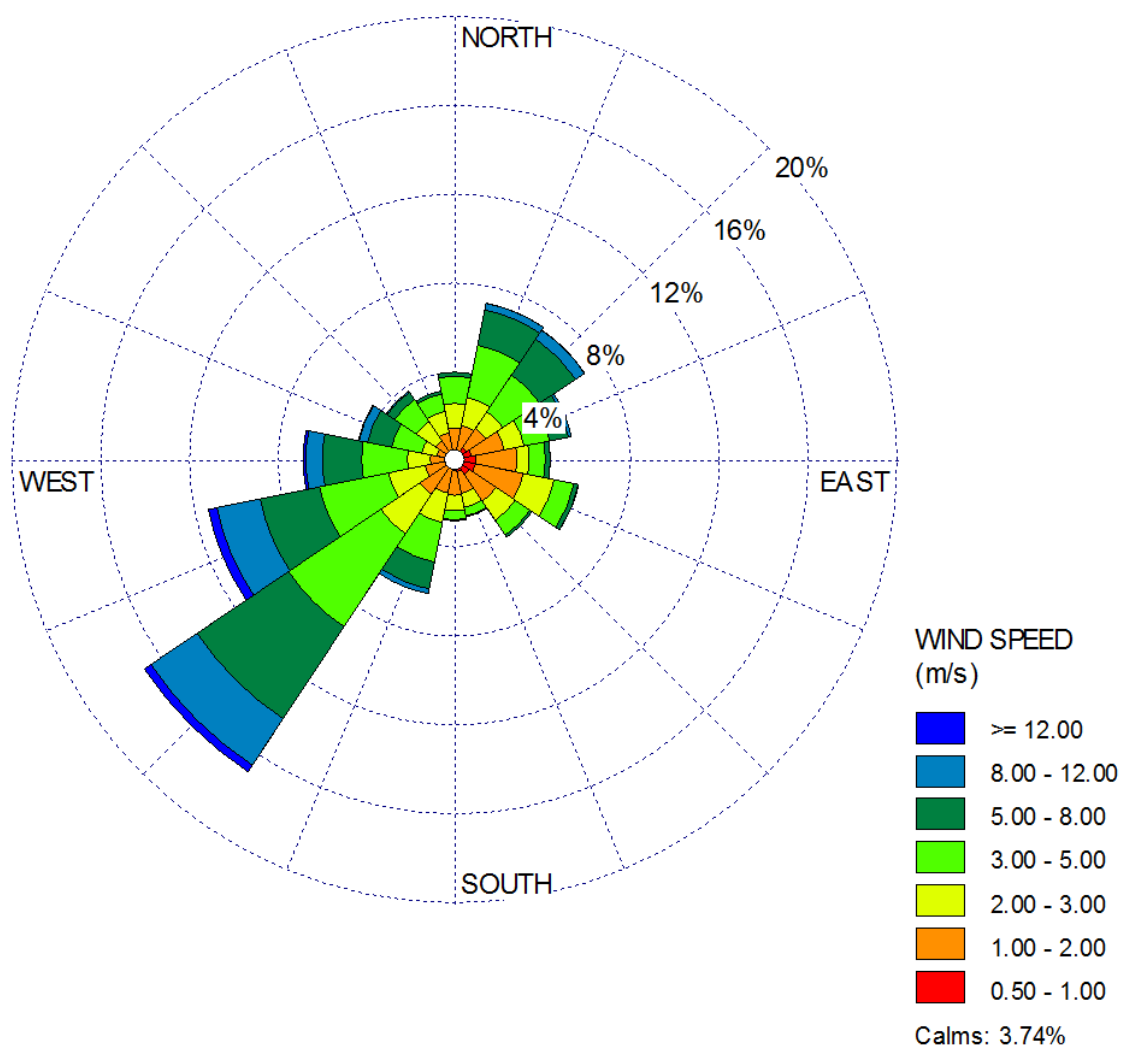


Figure 2: Frequency distribution of wind speeds and direction measurements, Pukekohe 2011 to 2015 (1-hour average data sourced from the NIWA CliFlo database)

### 3 Understanding of Proposed Plan Change

#### 3.1 Understanding of proposed activities

The conceptual layout of the Plan Change area is described in Figure 1 and Appendix A and includes:

- A rail/bus public transport hub adjacent to Flanagan Road and the main truck railway line at the north end of the Plan Change Area.
- A town/metropolitan centre will extend south from the transit hub. The town centre is likely to feature multi-storey development and a range of retail and commercial activities. Residential development is proposed above ground level in the town centre area.
- An open space reserve is proposed along the western boundary of the Plan Change Area, encompassing the Hingaia Stream.
- The Mixed Use Zone is proposed to occupy the bulk of the remainder of the Plan Change area to the east, south and northeast of the town centre. A range of commercial and residential activities will occupy this area.

#### 3.2 Discharges to air associated with proposed activities

The proposed changes to land use in the area may introduce additional discharges to air.

- Earthworks and construction activities during development of the site may result in dust emissions.
- The introduction of roads and parking infrastructure will increase vehicular traffic through the Plan Change Area and associated diesel/petrol combustion emissions.
- Residential development in the mixed use areas of the Plan Change area could potentially introduce solid fuel combustion emissions (i.e. from domestic log burners). However, the proportion of domestic heating provided by solid fuel combustion has declined substantially in Auckland in recent years<sup>3</sup> and new build dwellings are more likely to feature (emission-free) electric heating. Emissions of this type are therefore likely to be less significant than from older established residential areas of Auckland.
- Both the Metropolitan Town Centre and Mixed Use zones provide for commercial activities, which are not typically associated with significant discharges to air.
- Agricultural and horticultural discharges currently located within the Plan Change Area (as described in section 2.2) will be replaced by urban development.

#### 3.3 Sensitivity of the proposed activities to air pollution

In terms of sensitivity to air pollutants, the proposed development will increase human occupation of the area. Residential activities within the proposed mixed use areas are typically highly sensitive to degraded air quality as a result of prolonged human occupation and the increased likelihood of occupation by sensitive members of the community (e.g. infants and the elderly).

Human occupation at commercial properties in the metropolitan centre and surrounding Mixed Use zone area is likely to be transient or periodic – staff will be present over office hours or shift periods and customers for shorter durations. As a result, sensitivity to air quality in these areas is generally likely to be moderate. However, the town centre could include activities that involve sectors of the community with a heightened sensitivity to air quality, such as childcare centres and medical facilities.

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<sup>3</sup> Auckland Council. 2018. "Auckland air emissions inventory 2016 – home heating".

Overall, sensitivity to air pollutants is likely to be highest in residential areas of the development and potentially where activities such as childcare centres and medical facilities are located in the town centre or mixed use areas. Otherwise sensitivity to air pollutants is generally likely to be moderate.

## 4 Assessment of potential air quality impacts

### 4.1 Overview of assessment

The potential impacts of discharges to air associated with the type of activities likely to be introduced to the area as a result of the proposed Plan Change on local air quality are considered in section 4.2.

The corresponding potential impacts of existing local discharges to air adjacent to the Plan Change area on activities likely to be introduced to this area as a result of the proposed Plan Change are considered in section 4.3.

In both sections 4.2 and 4.3 the potential air quality impacts of the discharges in question on air quality are considered qualitatively taking into consideration the nature and scale of the emissions, the sensitivity of adjacent activities to those emissions and geographical and meteorological influences on propagation and dispersion of the emissions.

### 4.2 Potential impacts of discharges to air from proposed Plan Change area activities on local air quality

Discharges to air associated with activities that may be introduced to the area as a result of the Plan Change are discussed in section 3.2. These discharges have the potential to degrade local air quality (both within the Plan Change area and beyond), which in turn could result in adverse impacts on local activities (in terms of amenity or human health for example). The potential for introduced discharges to impact on local air quality is considered in Table 1.

**Table 1: Consideration of potential impacts of discharges to air from proposed Plan Change area activities on local air quality**

Plan Change area discharge	Discharge location within Plan Change area	Consideration of potential impacts on local air quality
Dust from earthworks	Earthworks areas during site development	Pastoral and market gardening activities in the rural areas adjacent to the Plan Change area are generally of low sensitivity to earthworks dust. Provided good dust management practices are employed, impacts on local activities should be minimal
Combustion emissions from vehicle traffic	Road and parking infrastructure	Traffic movements to and from commercial and residential activities introduced to the Plan Change area are likely to increase local concentrations of combustion contaminants to some degree. Impacts on air quality are likely to be no greater than in existing metropolitan and town centres in other parts of Auckland.
Combustion emissions from domestic heating	Residential properties in mixed use areas	As noted in section 3.2, combustion emissions from new build residential development are likely to be limited. The impacts of the emissions on local air quality should therefore be minimal and less than currently occurs in older established urban residential areas of Auckland.

Overall, dust emissions from construction earthworks and combustion emissions from both road traffic and domestic residential heating associated with the Plan Change could impact on local air quality within and beyond the Plan Change area. However, provided that construction dust is managed in accordance with good dust management practices (e.g. as recommended by MfE<sup>4</sup>) and road transport infrastructure is designed to minimise congestion, impacts on local air quality should be minimal.

#### 4.3 Potential air quality impacts of adjacent discharges on proposed Plan Change area activities

As noted in section 3.3, the Plan Change will result in the introduction to the area of activities of varying sensitivity to degraded air quality. Existing emissions sources in the area (as described in section 2.2) have the potential to degrade air quality, which could impact on sensitive activities introduced to the area (such as residential activities in the Metropolitan Centre and Mixed Use zones). This in turn could potentially result in reverse sensitivity impacts on adjacent discharge activities by constraining their ability to operate.

The potential for existing adjacent discharges to impact on activities likely to be introduced to the area as a result of the Plan Change is considered in Table 2.

**Table 2: Consideration of potential air quality impacts of adjacent discharges on proposed Plan Change area activities**

Adjacent discharge	Adjacent discharge location	Potential for air quality impacts on Plan Change area activities
Combustion emissions from vehicle traffic on local roads	SH1 and arterial routes (e.g. Great South Road)	As noted in section 2.2, SH1 represents the most significant source of transport emissions in the area. The proposed reserve area along the Hingaia Stream will mean that almost all mixed used areas that could feature sensitive activities are separated from the SH1 carriageway by at least 150 m <sup>5</sup> . Sensitive activities are therefore well separated from existing high traffic routes and adjacent transport emissions are likely to have minimal impact on air quality in the Plan Change area.
Emissions from adjacent commercial and light industrial activities (including odour, dust and combustion emissions)	Existing Drury Light Industry and Mixed Used zones	A variety of potential emission sources of a relatively small-scale exist in the commercial/light industrial area adjoining the Plan Change area to the northeast. In relation to the Plan Change area, the adjacent zoning is graduated in terms of potential for air emissions from Light Industry to the northeast of Great South Road to Mixed Use between Flanagan Road and Great South Road. The proposed zoning of the adjacent Plan Change area (Mixed Use) would represent a continuation of this graduation. Although a coffee roasting operation is located in the existing Mixed Use zone, this area provides a degree of buffer separation between the Light Industry zone and sensitive activities that could be located in the Plan Change Mixed Use

<sup>4</sup> MfE. 2016. Good Practice Guide for Assessing and Managing Dust

<sup>5</sup> The proposed version of the Auckland Unitary Plan (PAUP) included an Air Quality Transport Corridor Separation Overlay. This overlay discouraged the location of new childcare facilities (as an activity of high sensitivity to combustion emissions) within 150 m of regional strategic network roads (such as SH1) and within 70 m of regional arterial network roads.

Adjacent discharge	Adjacent discharge location	Potential for air quality impacts on Plan Change area activities
		zone in future. Additionally, the frequency of winds from the northwest quadrant (when emission sources in the adjacent the commercial/light industrial area will be upwind of the Plan Change area) are relatively infrequent. As a result, any impacts of emissions from the adjacent commercial/light industrial area on air quality in the Plan Change area are likely to be minimal.
	Drury South Light Industry Zone	The Drury South Light Industry Zone is located upwind of much of the Plan Change area in prevailing southwest winds. However, the proposed Hingaia stream reserve provides the proposed Metropolitan Centre and Mixed Use zones a degree of buffer separation from the existing Light Industry zone. Given the relatively small scale of emissions generally associated with Light Industry zone activities, impacts of these emissions on air quality within the Plan Change area are also likely to be minimal.
Odour, dust and combustion emissions from pastoral agricultural and market horticultural activities	Surrounding rural land	<p>Rural emission sources exist on rural properties adjacent to the Plan Change area (as currently also exist within the Plan change area).</p> <p>The potential for impact is generally likely to be low and similar to other urban developments at the interface with rural areas. Areas beyond the Plan Change area are also earmarked for future urban development and are therefore unlikely to be used for rural activities in future.</p>
Odour from wastewater reticulation infrastructure	Proposed WSL pump station and air vents along proposed sewer main	<p>The proposed WSL wastewater pump station will be located adjacent to the proposed transport hub area and other areas that are likely to feature a reasonably high density of human occupation at times. Untreated odour emissions to these areas could result in odour nuisance.</p> <p>However, WSL design drawings for the wastewater reticulation system (refer Civil Infrastructure report) indicate that a biofilter is proposed to treat odour from the pump station. Provided the biofilter and air extraction from the pump station is suitably designed and maintained, odour emissions should be minimal and odour nuisance able to be avoided.</p> <p>Other air vent locations in the proposed wastewater main (e.g. at the corner of Brookfield Road and Fitzgerald Road) are unlikely to feature a similarly high density of proximate human occupation but could potentially be located near odour sensitive activities within the proposed Mixed Use zone. Odour emissions control may also be required for such air vents, depending on location in relation to sensitive activities.</p>



Overall, in relation to the potential impacts of existing adjacent discharges on Plan Change area activities:

- Sensitive activities are well separated from high traffic routes in the area and adjacent transport emissions are likely to have minimal impact on air quality in the Plan Change area.
- Relatively small scale emission sources associated with adjacent commercial and light industrial activities (both existing and future activities as provided for by Light Industry zoning) are generally well separated from sensitive activities in the Plan Change area. The impacts of emissions from these activities on air quality within the Plan Change area are likely to be minimal.
- Odour from wastewater reticulation infrastructure that WSL proposes in the area could potentially cause nuisance if located in close proximity to sensitive activities in the Plan Change area. However nuisance effect should be able to be avoided through the use of appropriate emission control at air vent locations (e.g. such as the biofilter we understand is proposed at the pump station at Flanagan Road).

## 5 Conclusions

The Drury Metropolitan Centre Plan Change will result in the introduction of both emission sources of air pollutants to the area that could affect local air quality and activities that may be sensitive to emissions from existing sources in adjacent areas.

The conclusions of this assessment of the air quality impacts of the introduction of these activities as part of the Plan Change are as follows:

- The impacts of discharges to air introduced to the area should be minimal provided that good dust management practices are implemented during earthworks/construction; and
- The impacts of existing adjacent discharges to air on sensitive activities within the Plan Change area should also be minimal provided that appropriate emission control measures are implemented at air vents in the wastewater reticulation infrastructure proposed by WSL in the area.

## 6 Applicability

This report has been prepared for the exclusive use of our client Kiwi Property Trust Ltd, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

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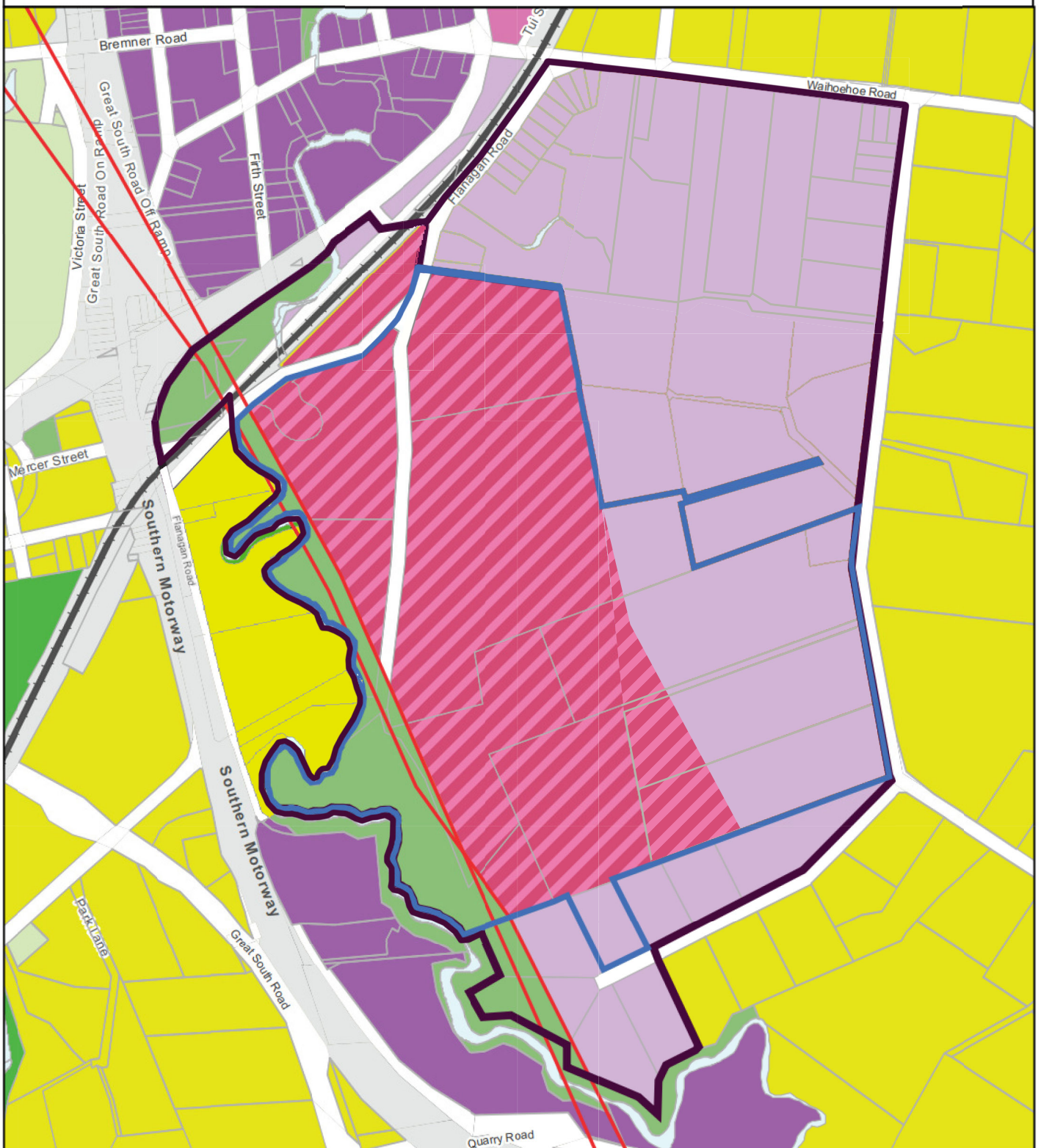
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## **Appendix A: Plan Change Area Zoning Plan**

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# Kiwi Drury - Zoning Plan August 2019



-  Kiwi Site
-  Proposed Plan Change Boundary
-  Proposed Metro Centre
-  Proposed Mixed Use
-  Proposed Open Space Zone

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