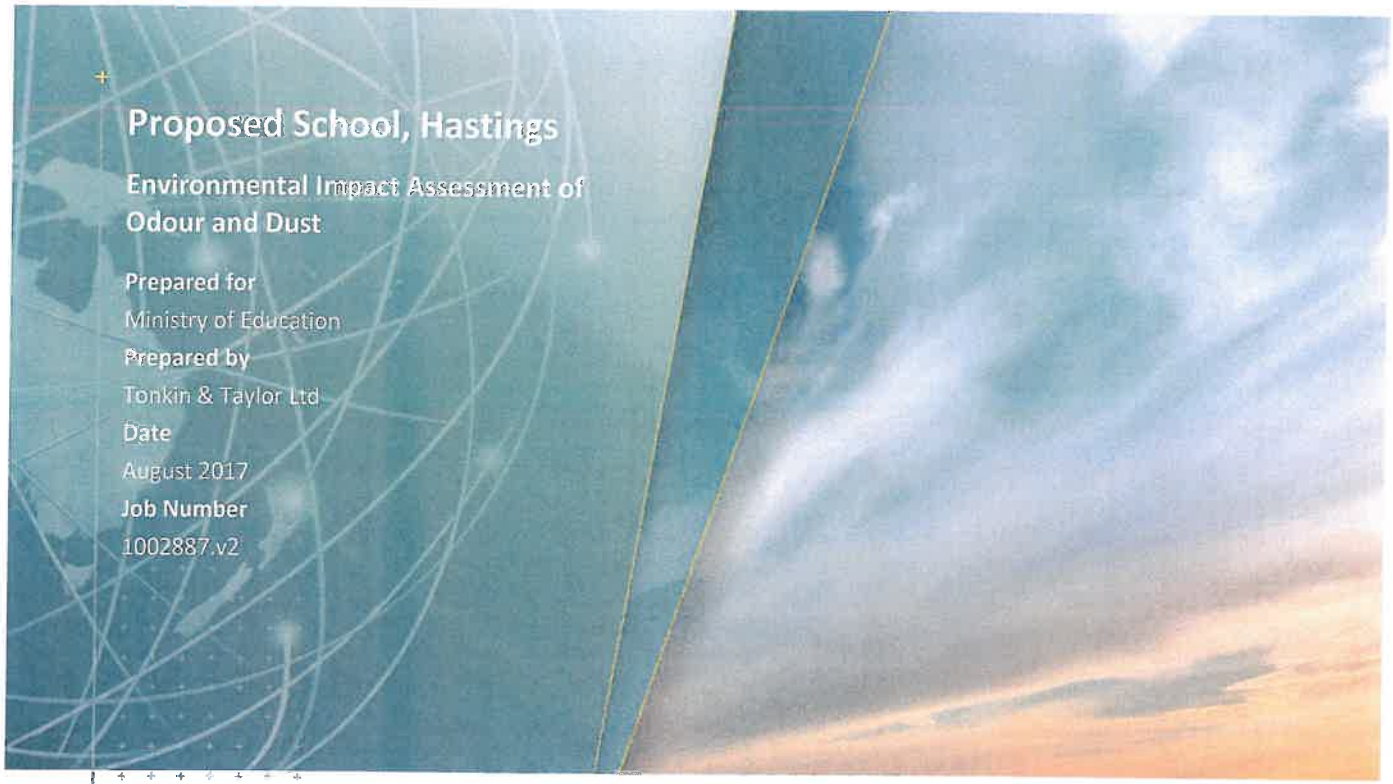
APPENDIX 7

Environmental Impact Assessment of Odour and Dust

REPORT

Tonkin+Taylor



Proposed School, Hastings

Environmental Impact Assessment of Odour and Dust

Prepared for
Ministry of Education
Prepared by
Tonkin & Taylor Ltd
Date
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1 Introduction

The Ministry of Education (MoE) is seeking to designate the part of site at 120 Bennett Road, Hastings, for a proposed school. The proposed school site is in the vicinity of a number of poultry farms on Bennett Road.

We have undertaken an assessment of the potential odour and dust effects on the proposed school associated with activities identified within the vicinity of the school site.

The assessment included the following tasks:

1 A desktop review to identify existing activities in the vicinity of the site that have the potential to generate odour and dust (a site visit was not undertaken);

2 Obtaining and reviewing copies of air discharge consents held for activities in the vicinity of the site (including the poultry farm) and compliance reports for existing activities on Bennett Road.

3 Review of the meteorological data from the closest weather station to determine the frequency of winds blowing from existing activity locations to the proposed school site;

4 Review of published guidance on separation distances for the activities identified in task 1 above; and

5 Preparation of this report outlining the findings of tasks 1 to 4 and presenting an assessment of the potential odour and dust impacts on the proposed school site from existing activities in the surrounding area.

The work has been undertaken in accordance with our proposal dated 15 April 2017.

2 Identification of activities

We have undertaken a review of existing activities in the vicinity of the site which may have the potential to generate odour or dust.

The review was based on the following information sources:

- Google Maps including street view;
- Hawkes Bay Regional Council Online Mapping tool – resource consents; and
- Online search.

The activities identified and the associated discharges to air and the distances to the proposed school site boundary and buildings are outlined in table 2.1 below and shown on Figure 1.

Table 2.1 Identified activities

Activity	Operator	Location	Activity	Potential discharges to air	Distance to proposed school	Holds a an air discharge consent
1	Spray Free Holdings Limited	72 Bennett Road	Composting of poultry manure, grape processing waste, vegetable waste, restaurant grease trap contents, wood shavings and saw dust.	Odour, dust	250 metres	Yes
2	Wave Eater Trust	46, 71 & 72 Bennett Road	Egg layer poultry farm and processing	Odour, dust	300 metres	No
3	Heinz/ Watties	Tomoana Road	Food processing and packaging and pet food manufacture.	Odour and products of combustion.	650 metres	Yes
4	Jamestrong Packaging NZ Limited	147 Elwood Road, Tomoana	Can manufacturing plant	Odour, products of combustion, VOCs	650 metres	Yes
5	Lowe Corporation	Coventry Road	Rendering plant	Odour	900 metres	Yes

Figure 1: Site location and identified activities

While a number of activities have been identified that generate dust, typically the effects of dust are limited to areas within the immediate vicinity of the source. All of the activities are at a sufficient distance from the school site, that no dust effects are considered likely.

While the adjacent properties are operated as orchards where spraying of agrichemicals is undertaken, the use and application of agrichemicals is not limited to orchards. Agrichemicals are used throughout the country for most rural activities as well as spraying within urban environments. We note that the Hawke's Bay Regional Resource Management Plan has comprehensive rules relating to the application of agrichemicals. This includes a permitted activity condition limiting the discharge of any agrichemical beyond the boundary of the application property for small scale application, and compliance with the mandatory requirements of the New Zealand Standard for the Management of Agrichemicals (NZS 8409:2004) for large scale application. NZS 8409 includes requirements to identify hazards and sensitive areas (such as the school), avoid impacts from spray drift, and ensuring that application is confined to the target area. In addition when application of agrichemicals is to occur on the adjacent site. In addition, the applicator, must notify adjacent properties prior to application and to use buffer zones to minimise spray drift hazard to sensitive areas.

Provided the methods outlined in NZS 8409 are implemented, the risk of spray drift impacting the school is low.

3 Resource consent and compliance

We have reviewed the Hawkes Bay Regional Council online consent database to identify existing consents for discharges to air for the activities identified in Section 2 above.

Table 3.1 summarises the activities which hold resource consent and the associated expiry date.

Table 3.1: Activities with air discharge consents

Activity	Consent Holder	Consent Purpose	Expiry date
1	Spray Free Holdings Limited;	to discharge contaminants into air (dust and odour) from a composting operation.	31/05/2025
3	Heinz/ Watties;	to discharge contaminants into air from the products of combustion from one 10MW boiler, one 8MW boiler, one 6MW boiler and one 1.5MW hot water boiler, and other activities associated with food processing and packaging and pet food manufacture.	31/05/2025
4	Jamestrong Packaging NZ Limited.	to discharge contaminants to air from a can manufacturing plant	31/05/2036
5	Lowe Corporation; and	to discharge contaminants into the air from a hide processing plant including odours from raw material handling, tanning and wastewater handling and combustion gases from two gas fired boilers (1.44 MW each) and three gas fired hot water heaters (313 kW, 428kW, 600kW).	31/05/2023

Copies of the resource consents for the above activities have been obtained. All of the consents include conditions relating to offensive or objectionable odour beyond the consent holders boundary. All of the consents including a condition that prohibits the discharge of offensive or objectionable odours beyond the boundary of the site.

Section 6.1.4 of the Hawkes Bay Regional Resource Management Plan includes guidance on the interpretation of offensive or objectionable. This outlines the considerations used to determine if an odour is considered offensive or objectionable. This includes:

i Location of an activity and sensitivity of the receiving environment;

ii Reasonableness – whether an ordinary person would consider the activity to be offensive or objectionable;

iii Existing uses and the impacts new activities may have on existing activities.

The determination will be made by a council officer and will be undertaken in response to complaints being made.

Therefore, while the consent conditions do provide some confidence that the four consented activities cannot discharge offensive or objectionable odours beyond the boundary, this does not mean that there will be no odours beyond the boundary. This is due to the fact that noticeable

odours may be experienced at the site, but that are at a level that would not be considered offensive or objectionable (e.g. occasional low level odours).

Further, one of the key considerations of whether an odour is offensive or objectionable according to the Hawkes Bay Regional Plan, is whether an odour generating activity was existing at the time a new sensitive activity (such as the school) established. Therefore, a stronger level of odour or more frequent odours may be experienced by the school before it is deemed offensive or objectionable than if the school was already existing.

We have obtained the most recent compliance monitoring report (dated 17 June 2016) for the composting operating operated by Sprayfree Holdings Limited. The report confirms the site was in full compliance with the conditions of its consents for the period 11 March 2014 to 15 June 2016.

The report indicates that the scale of composting is low and has reduced significantly from previous years. This is consistent with aerial photos of the site, where the current scale and volume of material in windrows appears to be significantly less than when the consent was granted. The report also confirms that no complaints have been received since the consent was granted in 2010. The consent assessment report indicates that the site had received 8 complaints between 2000 and 2010. The sources of odour were identified as being from a windrow that was too wet and had become anaerobic, turning of windows and from poultry manure.

4 Meteorological conditions

The proposed school site is located on the eastern edge of Hastings. The closest long term weather station is located at Whakatu, approximately 4 km east of the site. The weather station is operated by NIWA as part of its national meteorological network. A wind rose analysis of the wind speed and wind direction measured at Whakatu approximately is illustrated, overlain at the proposed site in Figure 3.1.

Situated on the Heretaunga Plains, the local topography is generally flat with little variation in topography. Regional meteorological conditions will be influenced by the ranges surrounding the plain and the coastal marine area at Hawkes Bay 7 km to the east.

The wind rose shows a reasonably strong prevalence for winds from the southwest at Whakatu with a secondary prevalence of winds from the northeast.

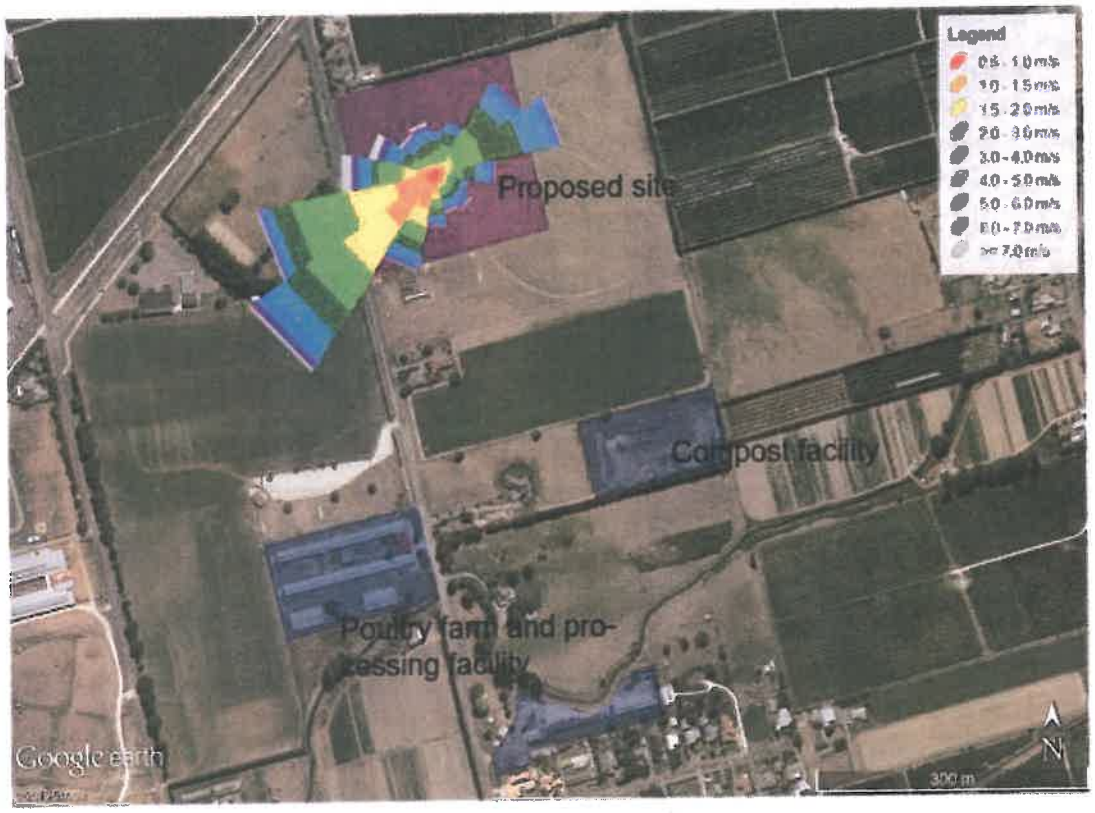

Figure 4.1: Wind rose for Whakatu weather station (2011-2015)

It is understood that during initial discussions between the Ministry of Education and Hastings District Council staff, that the predominant wind direction within the Hawkes Bay was from the North west direction which differs significantly from the monitoring data from the Whakatu site. We have reviewed the meteorological data for other monitoring locations with the Hawkes Bay operated by NIWA including Cape Kidnappers, Fenhill, Maraekakaho and Napier airport with the wind roses for the period June 2015 to June 2017 (except for cape kidnappers which is for the period January 2010 to July 2012) for each site shown on the attached figure. The wind roses show the predominant wind direction on the Hawkes Bay plains is from the south west (Whakatu and Napier Airport). The wind direction at Maraekakaho and Fernhill indicate the channelling of wind down the Ngaruroro River valley.

5 District plan provisions related to odour and dust

The proposed school site is currently zoned Plains under the Operative Hastings District Plan (Operative HDP) and zoned Plains production under the Proposed Hastings District Plan.

The Operative and Proposed HDP's identifies a number of issues, objectives and policies associated with the zone including amenity expectations and impact between different activities.

Operative HDP

Amenity expectations become more divergent as the range of activities widens throughout the zone.

"An increasingly diverse range of activities in the zone may generate differing expectations of acceptable levels of amenity. These expectations may not be consistent with currently accepted amenity levels, or with the amenity standards applied to adjoining activities. For example, noise and orchard management practices may generate adverse effects on the amenity levels of adjoining residential dwellings. Activities establishing in the zone will need to recognise existing, accepted amenity levels, which reflect common management practices in the zone and the effects of the operation of existing activities in adjacent zones."

"PLO4 To ensure that existing levels of amenity associated with existing land based primary production on the Plains are maintained."

"PLP5 Activities locating in the Plains Zone will need to accept existing amenity levels associated with well-established land use management practices involved with the sustainable use of the soil resource."

Proposed HDP

"POLICY PPP13 Require that any activity locating within the Plains Production Zone will need to accept existing amenity levels and the accepted management practices for land based primary production activities."

This creates an expectation that new activities establishing in the zone (such as the proposed school) need to recognise existing amenity levels. Therefore, it is anticipated that some level of amenity effects are to be expected in the zone and the level of odour and dust effects within the zone may be greater than those anticipated within Hastings itself.

It is also likely that students and teachers come from the surrounding communities who will be familiar with the area and associated amenity expectations, and therefore may be more tolerant of a level of odour that would not acceptable within an urban environment.

6 Separation distance guidelines

6.1 Need for appropriate separation

The establishment of separation distances (also commonly referred to as buffer areas) to separate industrial activities from more sensitive activities is a recognised land use planning tool. These separation distances serve both to protect **existing** industrial activities from encroachment and reverse sensitivity effects from **new** activities as well as to minimise potential effects on **existing** sensitive activities from the legitimate operation of industrial activities. In this context sensitive activities include activities with an expectation of high amenity or where there is a high density of people which increases the potential for amenity effects, which would include schools.

The primary purpose of separation distances is to inform decisions about changing the sensitivity of an area and they are not intended to inform decisions around managing pre-existing conflicts.

The maintenance of adequate separation distances is not intended to be a substitute for good on-site controls to minimise effects of air emissions and does not detract from resource consent conditions that require consent holders to manage effects beyond the boundary of their site. However, the use of separation distances does recognise that, even when industries adopt good pollution control technology and management measures, there may still be unintended emissions as a result of factors such as equipment failure, accidents or unusually adverse weather conditions. Published separation distance guidelines can be used to identify typical distances at which these unintended emissions may impact.

6.2 New Zealand guidelines

There are no relevant New Zealand guidelines for separation distances from industrial facilities to protect against air quality effects. The Auckland Council commissioned a discussion document on separation distances for industry that was published in July 2012[1]. This discussion document was largely based on a review of Australian guidance (discussed in the following section) and included several specific recommendations based on the rules in the Auckland Regional Plan: Air Land and Water. While no New Zealand guidance documents exist which cover a range of different activities, there are a number of activity-specific separation distance recommendations or requirements within Regional and District Plan rules. This includes Appendix V of the Taranaki Regional Plan which outlines recommended separation distances for intensive poultry farming. This includes recommended buffer distances based on the number of poultry housed and the landuse type (eg: dwelling, sensitive area, road or boundary) although the technical basis or supporting information behind the buffer distances is not stated.

For a poultry farm with 30,000 to 60,000 birds, the recommended buffer distance in the Taranaki Regional Plan to a sensitive area is 200 metres, although it does recommend increasing the distance by up to 50% where the sensitive area is located downwind of the prevailing wind direction. This would increase the recommended separation distance to 300 metres from the closest wall of the nearest shed of the adjacent poultry farm to the school.

6.3 Australian guidelines

There are a number of Australian state guidelines for separation distances based on potential for amenity effects of odour and dust from industrial activities. The current Tasmanian guidance was prescribed in 1996 and, because of its age we have not used it in preference to the more recent guidance from other Australian states.

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

Table 6.1: Australian guidance documents on separation distances

Guidelines	State	Basis for guideline
South Australia EPA Evaluation distances for effective air quality and noise management (2016) (SA EPA)	South Australia	Odour and dust
Victorian EPA, Recommended Separation Distances for Industrial Residual Air Emissions – Guideline (March 2013) (Vic EPA)	Victoria	Odour and dust
Western Australia EPA, Guidance for the Assessment of Environmental Factors, No. 3, Separation Distances between Industrial and Sensitive Land Uses (June 2005) (WA EPA)	Western Australia	Odour, dust, noise and vibration

The recommended separation distances for each activity identified above are summarised in Table 6.2 below.

Table 6.2: Recommended separation distances

Activity		Basis	Separation distances
1	Composting of up to 1,500 m^3 at any time of poultry manure, grape processing waste, vegetable waste, restaurant grease trap contents, wood shavings and saw dust.	Odour	500 to 1,000 metres
2	Egg layer poultry farm and processing (up to 60,000 birds)	Odour	535 metres*
3	Food processing and packaging and pet food manufacture.	Odour	100 to 500 metres
4	Can manufacturing plant (surface coatings)	Odour	300 metres
5	Tannery	Odour	500 to 1,000 metres

* Based on calculation in Appendix 2 of South Australian Guidelines for a 60,000 bird layer farm

6.4 Evaluation of separation distances

The recommended separation distances for each activity and comparison between the existing distances and the recommended distances are outlined in Table 6.3 below.

Table 6.3 Comparison of actual and recommended separation distances

Activity		Distance to site boundary	Recommended separation distances - low	Recommended separation distances - high	Recommended separation distances met
1	Composting operation	250 metres	500 metres	1,000 metres	**No**
2	Poultry farm	300 metres	300 metres	535 metres	**Low distance only**
3	Food processing and packaging and pet food manufacture.	650 metres	100 metres	500 metres	**Yes**
4	Can manufacturing plant (surface coatings)	650 metres	300 metres	300 metres	**Yes**
5	Tannery	1,000 metres	500 metres	1,000 metres	**Yes**

The only activities which are located closer than the recommended separation distances are the composting operation and the poultry farm.

The recommended separation distances for the poultry farm and composting operation are shown in Fig 6.1 below.

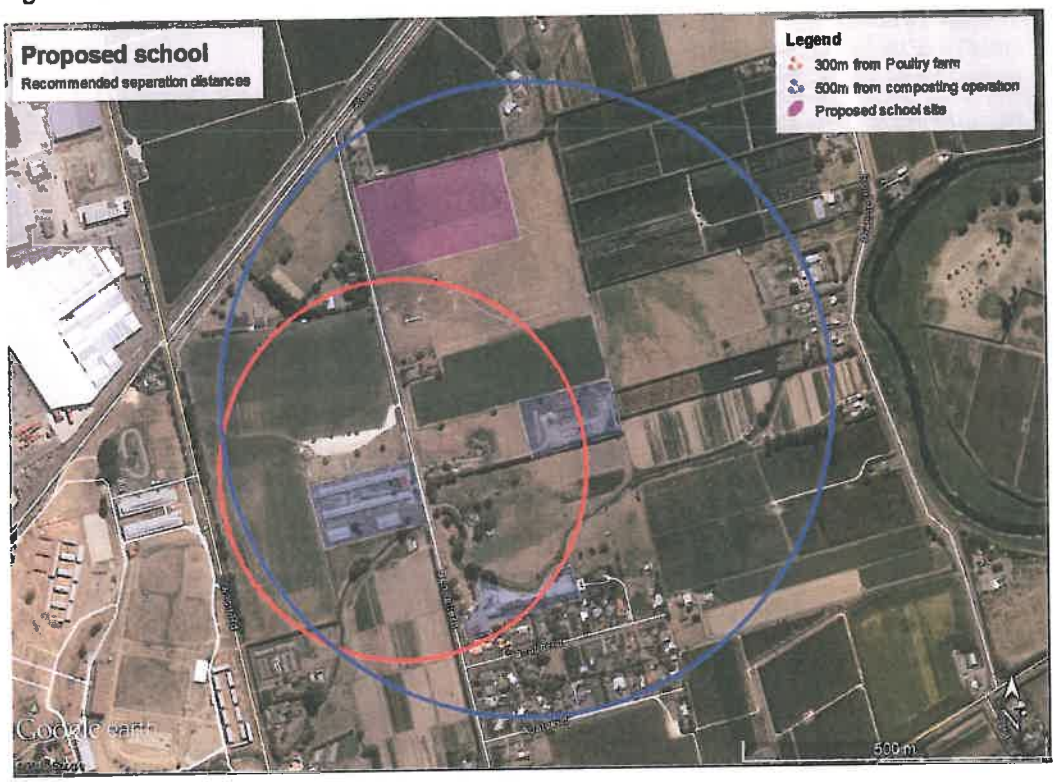

Figure 6.1: Separation distances and site location

While the separation distances do give an indication of where the potential for odour to be present is likely, it does not assist in understanding the frequency or intensity of the odours and whether they are acceptable within the existing environment. The separation distances for composting operations are also based on large scale composting operations and therefore, the lower range of the distances would be more appropriate as an indicator of potential effects from the existing small scale composting facility in the area.

7 Assessment of potential effects

7.1 Introduction

We have undertaken an assessment of the potential effects of odour from the activities identified in the vicinity of the proposed school site that have potential for odour effects.

The desktop review has identified two activities within the vicinity of the proposed school site which have the potential to generate odour and are close enough to impact the site. These comprise the poultry farm and the composing facility. All other activities are located at sufficient distance from the proposed site that the likelihood of odours from their activities affecting the site are not significant.

7.2 Composting facility

The consent for the composting facility includes authorisation to handle and compost a range of material including chicken manure. Spent chicken manure has the potential to have a high odour generation potential. Odour complaints associated with the handling and spreading of chicken manure are relatively common within New Zealand. The composting facility is located 250 metres from the proposed school, with the whole school site within 500 metres of the composting facility although the school is not downwind of the predominant wind direction.

While the composting facility holds a current consent for the operation which does not expire until 31/05/2025, we note that the most recent aerial photo dated 3 September 2016 does not show any active activities on the site. This is further supported by the compliance records which confirm that the scale of operations has reduced significantly since the consent was first granted. Therefore, two scenarios need to be considered to identify the potential effects on the proposed school site comprising the existing scale of operation and secondly the maximum permissible scale provided for by the consent.

The potential for odour from the activity to affect the school site is determined by the scale of operation, when activities with an increased risk of odours are undertaken, when students are likely to be present on site and local meteorology as indicated by wind direction and wind speed.

Odours impacts are more likely during periods of calm or low winds speeds where odour dispersion is poorest. During higher wind speeds, increased dispersion occurs reducing the potential impacts from odour sources. We have reviewed the meteorological data to understand the frequency of calms at the site and the frequency of low wind speeds that would result in the school being downwind of the composting operation. The review has identified that calm winds (<1.5 m/s) occur 22% of the time and light winds (<3.0 m/s) from the south to southeast occur less than 1% of the time.

Although the proportion of calms is relatively high, approximately 80% of the calms occur overnight between 4pm and 8am which is outside normal school hours. The total percentage of time that calms and light winds blowing towards the site occur during school hours is approximately only 5% of the time which does not take into account weekends and school holidays.

At present the scale of the activity is relatively low, with only small volumes of material on-site. The small scale reduces the overall volume of material which could generate odour as well as reducing the frequency and duration of activities which have increased potential for odour generation. The main sources of odour from composting operations is during the initial receipt and handling of the material and during turning of the windrows. Discussions between the Ministry of Education staff and the operator of the composting facility indicates that at the present scale of operation, the windrows are only being turned once a month. The volume of composted material is also currently

relatively small, which means it is less likely to generate significant odour during initial receipt and handling for extended periods of time.

Based on the separation distances (250 metres), the existing scale of operation and the limited calms or light winds occurring **during normal school hours**, it is considered that the risk of odours impacting the school is currently low and any odours are likely to only be present occasionally and of a low level. While the proportion of calms is significantly higher outside of normal school hours including evenings and overnight, the activities which have an increased level of odour generation (such as receipt of material and turning the windrows) would not be typically undertaken reducing the risk of odours impacting the school.

If the event that the scale of activity increased to the level that is permitted by the consent, the frequency of odours being generated and the intensity of those odours would both increase. The extent of the increase is uncertain, although the risk of odours being present at the proposed school location during normal school hours is still considered to be low due to the low proportion of calms or winds from the direction of the composting facilities but there is an increased risk that the odours would be considered to be offensive or objectionable.

7.3 Poultry farm

The poultry farm has authorisation under the Hastings District Plan for up to 60,000 birds. Odours from poultry farms have been known to cause odour effects out to distances greater than the separation between the farm and the proposed school site depending on the type of farm and operation. The farm is located 300 metres to the southwest of the proposed school site, with the school site being downwind of the predominant wind direction.

The risk of odours will vary over the site, depending on the distance from the source (in this case the Poultry sheds), how the farm is operated and the weather conditions. The worst case conditions for odour is light winds where odours can travel greater distances without being dispersed. During stronger winds, odours are more easily dispersed. Calm conditions are most commonly experienced during still early mornings before any sea and land breezes occur and in the evenings. As students are less likely to be on-site during early mornings and evenings, while there is a higher risk of odours being present, the effects will be reduced.

The boundary of the proposed site is 300 metres from the closest wall of the existing chicken sheds. The north-eastern corner of the proposed school site is over 570 metres away. Separation distances can be used to provide both internal and external buffers (by locating sensitive activities within the site as far as possible from the odour source). While the external boundary separation distance is only 300 metres, provided more sensitive areas such as classrooms are located on the northern boundary of the proposed site, then greater separation distances can be achieved.

As outlined above, calm conditions only occur less than 5% of the time during school hours. We have also evaluated the proportion of light winds (between 1.5 m/s and 3.0 m/s) blowing towards the site from the poultry farm. This has identified that the percentage of time that light winds occur and blowing towards the school during school hours is approximately 3% of the time. Cumulatively this means that calms or light winds towards the school occur less than 8% of the time during school hours which does not take into account weekends and school holidays.

During **normal school hours** the potential risk of odours from the poultry farm being present on-site beyond 300 metres during normal school hours is considered to be low. The risk of odours impacting the site increases outside school hours including early mornings, evenings or overnight as there is a greater proportion of calms or light winds (22%).

8 Possible odour mitigation methods

T+T has considered whether there are practical measures that could be incorporated into the school design that may reduce the effects of any odours that may occur at the proposed site. Identified measures include:

- Maximising separation distances between the main school areas and the adjacent poultry farm and composting operation by locating the development of facilities (buildings or sportsgrounds) on the northern side of the property;
- Minimising opening windows on the southern sides of buildings;
- Designing the school to face or 'open out' away to the north;
- Using mechanical ventilation and filtration within the building design to avoid having open windows; and
- The use of screening on the boundary.

While these measures may reduce odour effects to some extent, it is our experience that they are not usually sufficient to avoid odour effects inside the buildings where odours are present. Although the measures will not eliminate the risk of odours, if they can be easily considered or incorporated as part of the school design, then any benefit will assist in reducing any odour effects at the school.

Apart from maximising separation distance and use of screening, these measures are all directed at protecting air quality within the school buildings and do not address or mitigate odours in outdoor areas.

9 Conclusions

Ministry of Education is seeking to establish a new school at 90 & 120 Bennett Road, Hastings. We have undertaken an assessment of the potential odour and dust effects associated with activities identified within the vicinity of the school site.

Five activities with the potential to generate odour or dust were identified in the vicinity of the site. Of the five activities only two are located close enough that odours are considered to be potentially experienced on the proposed site: a poultry farm to the southwest and a composting operation to the south.

This risk of odours from the poultry farm and composting facility being present on the school site and being considered to be offensive or objectionable during normal school hours has been assessed as low based on the following aspects:

- The proposed school buildings are separated from the poultry farm and composting operations by 250 to 300 metres;
- During normal school hours the percentage of calms or light winds directed towards to the school from the composting facility and poultry farm is low (between 5% and 8% of the time); and
- The composting operation is only small scale and is currently operating at a low level with activities with increased odour potential (such as turning the windrows) only being undertaken occasionally, (approximately monthly).

The risk of odours being present on the school site and considered to be offensive or objectionable outside of school hours is greater than during normal school hours but is still considered to be low for the following reasons:

- The proposed school is separated from the poultry farm and composting operations by 250 to 300 metres; and
- While the proportion of calms is greater (approximately 22% of time), there is reduced likelihood of activities which have a greater potential for odour to be undertaken.

If the scale of the composting operation increased from the current level, there would be an increased risk of odours impacting on the school site.

While the assessment has evaluated the risk of odours considered to be offensive or objectionable is low, this does not mean that the school site will have no odours present.

There are a number of methods to further mitigate any potential odours that could be considered as part of the proposed school layout and design, including maximising separation distances through site layout.

10 Applicability

This report has been prepared for the exclusive use of our client Ministry of Education, 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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rvdm
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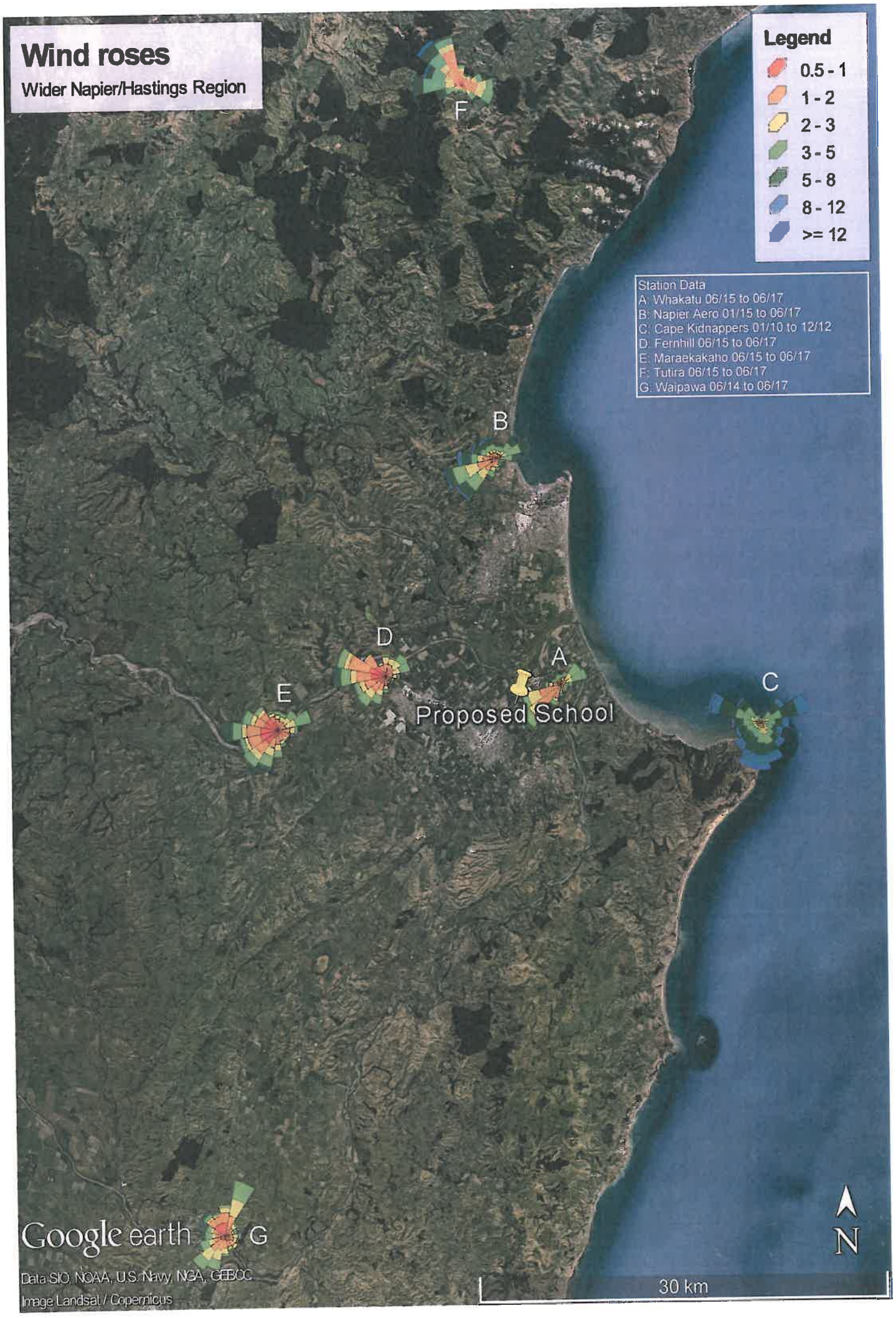
Wind roses
Wider Napier/Hastings Region
Legend
0.5 - 1
1 - 2
2 - 3
3 - 5
5 - 8
8 - 12
>= 12
Station Data
A: Whakatu 06/15 to 06/17
B: Napier Aero 01/15 to 06/17
C: Cape Kidnappers 01/10 to 12/12
D: Fernhill 06/15 to 06/17
E: Maraekakaho 06/15 to 06/17
F: Tutira 06/15 to 06/17
G: Waipawa 06/14 to 06/17
A
B
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E
F
G
Proposed School
Google earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
N
30 km