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# VicUrban

## Report for Hygain Feeds Pty Ltd
## Hickson Rd, Officer

### Buffer Assessment

September 2011

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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# 1. Introduction and Context

GHD was engaged by VicUrban to conduct an assessment of the Hygain feedmill facility at Officer, Gippsland to determine an appropriate amenity buffer for the facility. The purpose of a buffer is to provide sufficient separation between sensitive land uses (such as residences) and industries that have the potential to generate emissions (dust and/or odour) that can (on the occasion of an upset or malfunction) cause dis-amenity off-site.

Buffer distances are specified for a range of industry type categories, but feedmills are not specifically identified as requiring a buffer.

At present the Hygain feedmill is situated in Industrial 1 (IN1) zoned land (see Figure 1) which in turn is generally surrounded by land zoned Urban Growth (UG) The nearest residential zoned land is at approximately 150m to the WNW – a start of lots on the west side of Station Street, north of the rail-line.

VicUrban own large parcels of land to the SW, S, SE and E of Hygain as well as land parcels top the north of the rail-line. As part of development of this land for future use, VicUrban wish to obtain an independent assessment of the appropriate buffer to allow between Hygain and the proposed residential development.

This report considers the type and scale of operations at Hygain and examines the industry categories in the buffer guidelines and VPP separation distances that might be considered to include feedmills as a sub-set. The general performance of feedmills in Victoria with respect to off-site impact is considered, and an approximate estimate of an appropriate buffer for the Hygain operation at Officer is derived. The local meteorological conditions are also considered to determine whether and to what extent, the buffer distance would be made to be directionally dependant in order to give a more equal risk of exposure to disamenity in the event of a process upset.

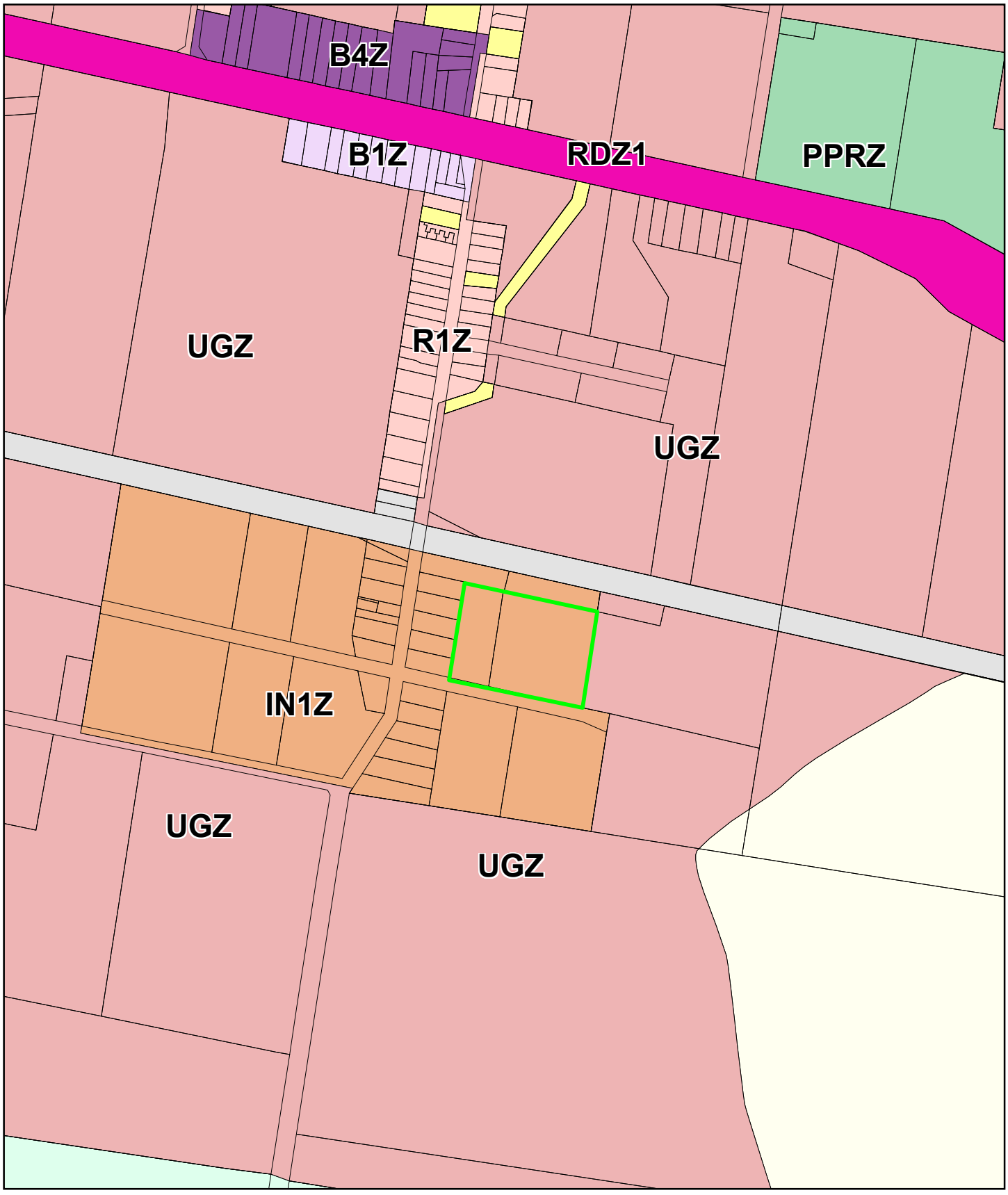
An initial survey (exterior to the Hygain site) was conducted on 11 October 2010, and a perimeter survey was also conducted on 19 October to estimate the perceived intensity of downwind odour emanating from the premises.

Recently, in July 2011, VicUrban engaged GHD to participate in discussions with Dr Terry Bellair of Consulting Environmental Engineers (CEE) acting for Hygain to see if a compromise could be reached in arriving at a mutually acceptable buffer between that proposed by GHD and that advocated by Hygain. Two meetings were held between GHD (Tim Pollock) and Dr Bellair, the first on 1 August with Mark Brennan (Growth Area Authority - GAA) present for parts of the meeting, and the second on 4 August at the GAA's offices when representatives of Hygain, Cardinia Shire, VicUrban and GAA were present. At the second meeting GHD presented a revised directional buffer that was based on accepting some statements in the original CEE report[1] in relation to the acceptability of the separation of the Hygain premises from the nearest land zoned residential.

This revised report details the additional work done to arrive at the revised directional buffer, and explains its status and potential use in arriving at proposed changes to the Local Precinct Structure Plan that will give effect to a separation of future sensitive land uses from Hygain's operations. This would then serve as a basis for negotiation between the parties.

This report is subject to the limitations given in Section 9.

[1] CEE 2006. Proposed Expansion of Hygain Feed Mill, Officer – Air Quality Assessment. Consulting Environmental Engineers, 2 March 2006




**LEGEND**

- Premises Boundary
- Road Zone - Category 1
- Urban Growth Zone
- Residential Zone 1
- Business Zone 4
- Business Zone 1
- Industrial Zone 1
- Public Park and Recreation Zone

1:8,000 (at A4)

0 80 160 220

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Hygain Buffer Assessment

Current Zoning in Vicinity of Hygain Facility

Job Number 31/26688
Revision A
Date 25/10/2010

Figure 1

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# 2. Hygain Operations at Officer Site

Hygain have focussed on the production of feed for horses (equine rations) only, and does not operate in the larger domestic markets for pig, poultry and dairy feeds. Hygain has established an overseas market for equine feeds and provides feeds/supplements for all aspects of the market (racing, equestrian, stallions, brood mares etc).

The facility was originally established at Officer in 1992 and was enlarged to give a greater processing capacity in 2006. It currently has a maximum processing capacity of ~ 100,000 tonne per year.

GHD requested a site tour and inspection of operations at the facility, and unfortunately this request (after consideration by Hygain directors for some weeks) was not acceded to[2]. As a consequence GHD has had to rely on the description of Hygain's operations as given in a consultant's report[3] commissioned by Hygain to support their application for expansion. On the basis of the stated delivery rate of bulk grains and oilseed to the plant given in the CEE report (15 deliveries per week), the calculated average product throughput at that time was likely to be less than half the maximum capacity (i.e. 50,000 tpy). At the meeting on 1 August 2011, Dr Terry Bellair advised the participants that the annual throughput at Hygain for year 2010 was ~ 70,000 tpy.

## 2.1 Current Operations

The description given below is a précis of that given in the CEE report, section 4.

Raw Materials

- The bulk materials (grains and oilseed) are delivered by truck and tipped to a hopper. From there, enclosed screw and bucket conveyors send the product to fully enclosed silos.
- Processing
- Computer control is used on the weighing, blending and processing operations to ensure product specifications are met. The main processing lines comprise;
  - Grain cleaning line
  - Batching unit – to blend ingredients
  - Microniser line to flake grains to improve digestibility
  - Steam Flaking line where the feed is treated with steam to further improve digestibility and to condition for pelletising
  - Cooling prior to bagging and shrink wrapping onto pallets

[2] G. Manley pers. Comm..

[3] CEE 2006. Proposed Expansion of Hygain Feed Mill, Officer – Air Quality Assessment. Consulting Environmental Engineers, 2 March 2006

## 2.2 Proposed Upgrade

Hygain submitted an Application for a Planning Permit to double processing capacity in 2006, and the CEE and Ratio Consultants[4] reports were commissioned in support of the application. The application was granted and Figure 2 shows the current and original building and silo array layouts on an aerial photograph taken in January 2010.

## 2.3 Emission Control Systems

CEE makes the point that (unlike feed mills producing poultry and pig feeds) there are no animal-based ingredients such as tallow and meat meal, each of which are significantly odorous. The sole ingredient with a significant odour is molasses, and this odour would not be considered unduly offensive.

GHD concurs with CEE's opinion that the emission of potential concern at the Hygain facility is dust, not odour. Further, the dust emission sources on-site are either mitigated by fabric filters (baghouses), or cyclone (where the elevated moisture content precludes the use of fabric filters). The specific dust emission points are detailed in section 5.2 of the CEE report as follows;

- Grain cleaning – extracted dust sent to baghouse
- Batching unit - extracted dust sent to baghouse
- Microniser - extracted dust sent to baghouse
- Steam Flaking – extracted dust sent to cyclone

The dust collection efficiency of fabric filters is independent of particle size and is typically > 99.9% removal. A cyclone's removal efficiency falls off as particle size reduces and will typically give a removal efficiency of ~ 85% for coarse dust, reducing to 65% foe fine dust. Hence the application of these mitigation technologies dramatically reduces dust emissions at source.

It should be noted however that these mitigation measures have no effect in reducing odour emissions – except to the extent that a fraction of the odorous gases may be adsorbed to particulates.

## 2.4 Failure of Dust Mitigation at Hygain – August – October 2004

An example of the impact of a failure of a baghouse is the incident in late 2004, and investigated on 7th October 2004 by GHD[5] (Mr Paul Clarey) for Cardinia Shire Council. In that case the complaint was from the neighbouring auto salvage operation immediately east of the Hygain site, and related to the deposition of dust. Further investigation by Hygain[6] showed that the cause was a failure of one or more 'socks' in a baghouse, leading to unmitigated emissions depositing on car bodies in the auto salvage yard. CEE report that Hygain has since revised the maintenance procedures for the baghouses to ensure that bags are progressively replaced at each inspection.

[4] Ratio 2006, Town Planning report – Proposed extensions and alterations to existing horse feed facility. Ratio Consultants # 7157

[5] GHD 2004. Letter to Cardinia Shire Council. # 89522.

[6] CEE 2006 , Section 5.2


**LEGEND**

- Premises Boundary
- Leased to Horticultural Supplies Firm
- Eastern Extent of Original Premises
- Old Buildings
- New Buildings
- Envelope of potential odour/dust sources

**S = Silo**
**O = Office**
**F = Factory**
**W = Warehouse**

1:1,500 (at A4)
0 15 30 45
metres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Layout of Buildings on Hygain Premises

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Figure 2

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# 3. Perimeter Inspection

A perimeter inspection of the Hygain premises was conducted by GHD (M Asimakis) on the morning of 19 October 2010, and the field sheet and comments are attached as Appendix A. The purpose of the survey was to determine the degree of perceived odour impact (if any) outside the Hygain premises. The results of such a survey are hostage to the olfactory acuity of the 'sniffer'. This can be quantified by checking the person's measured odour threshold to the reference odorant n-butanol. This had been done earlier on a similar perimeter survey at another premises, and Mr Asimakis returned an n-butanol threshold concentration of 38 ppb. As 40 ppb is the accepted median response, the perceived intensity results will be typical of the general public.

To ensure the survey was conducted when the impact would be greatest, a day with forecast light winds was chosen. The survey was conducted from 1040 hrs to 1110 hrs, during which a light SE wind was observed. The nearest operating EPA AQMS was Dandenong. Wind data at that station showed a very light 0.7 m/s SE breeze at 10 am, veering to a light 1.7 m/s southerly wind by 11 am.

A weak 'biscuit/grain' odour was detected at the corner of the railway station carpark and Station St on the first traverse. On the return traverse the same 'biscuit/grain' odour was detected (this time as 'definite') along the southern boundary of the station car park, from Station St up to the first entrance to Hygain. The odour was described as 'not offensive' so that it is unlikely that complaints would be registered on exposure to this character of odour.

The detection of distinct odour on the downwind site boundary during normal operations would strictly be the trigger for a requirement by EPA to mitigate odour emissions. However, in practice, it is only when odour complaints are received and validated that EPA may issue a PAN (Pollution Abatement Notice) to the feedmill operator to ensure emissions are mitigated. If the odour is sufficiently offensive, EPA may issue a PIN (Penalty Infringement Notice), with consequent legal proceedings.

Note that it has been assumed by GHD that operations were routine at the time of the survey, so that there may be an implication that an upset leading to increased emission rate of **odour** (rather than dust) could generate a need for a buffer of the same order as derived later in this report for an upset leading **dust** impact. While this issue has not to GHD's knowledge been raised or considered by EPA, it seems likely that the impact of dust (visual and/or deposition – which accumulates as the upset persists) would be given more weight than an odour impact. The latter requires the presence of people before an impact is perceived, and in any case is unlikely to be considered offensive.

# 4. Meteorology

The wind climate at the Hygain site is required so that; (i) the directions of prevailing winds, and (ii) the directions of good and poor dispersion, can be determined. In the directions of poor dispersion the maximum extent of impact from an odour/dust emission during an upset/malfunction can be increased. Similarly in the direction of good dispersion, the maximum extent of impact will be reduced.

## 4.1 Choice of Meteorological dataset

Ideally a 12 month dataset recorded at hourly intervals is required to fully characterise annual average, diurnal and seasonal variations in wind climate. The nearest meteorological dataset is from the EPA AQMS (air quality monitoring station) located in the centre of the Pakenham racecourse, some 7 km to the east south east of the Hygain premises. As there is no intervening terrain, the Pakenham dataset will be representative of the wind climate at Hygain.

GHD obtained a 12 month dataset (July 2005 – June 2006) from EPA to enable the wind climate to be characterised.

## 4.2 Wind Climate

Figure 2 shows the annual windrose for the Pakenham data and the following features can be seen:

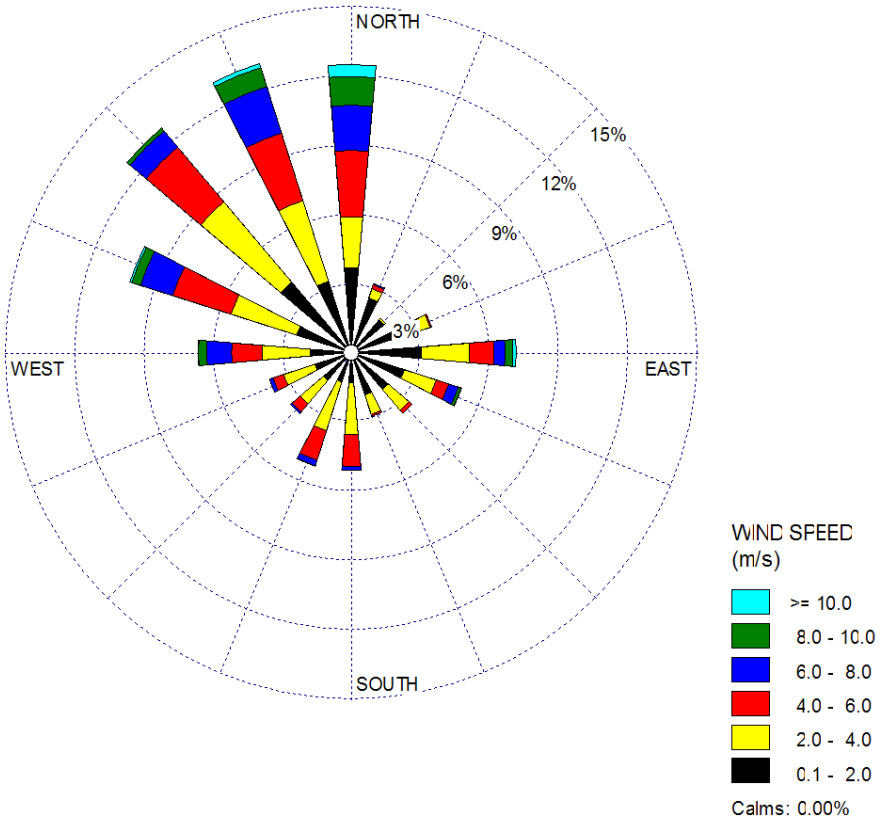
- The prevailing wind directions are from the NW quadrant, with a combined incidence of 55%;
- There is a clear east/west axis of winds, reflecting the Latrobe Valley axis, and
- The incidence of light winds is highest from the N and NW, with a separate incidence of E and ESE winds (i.e. up-valley).

The mean wind speed shows little seasonal variation, as shown in Table 1.

**Table 1 Seasonal Variation in Mean Wind Speed - Pakenham 2005/2006**

| Season | Annual | Summer | Autumn | Winter | Spring |
|---|---|---|---|---|---|
| Wind Speed m/s | 3.19 | 3.06 | 3.02 | 3.22 | 3.25 |
| % of Annual Mean | 100 | 96 | 95 | 101 | 105 |

**Figure 3 Annual Wind Rose - Pakenham AQMS 2005/2006**

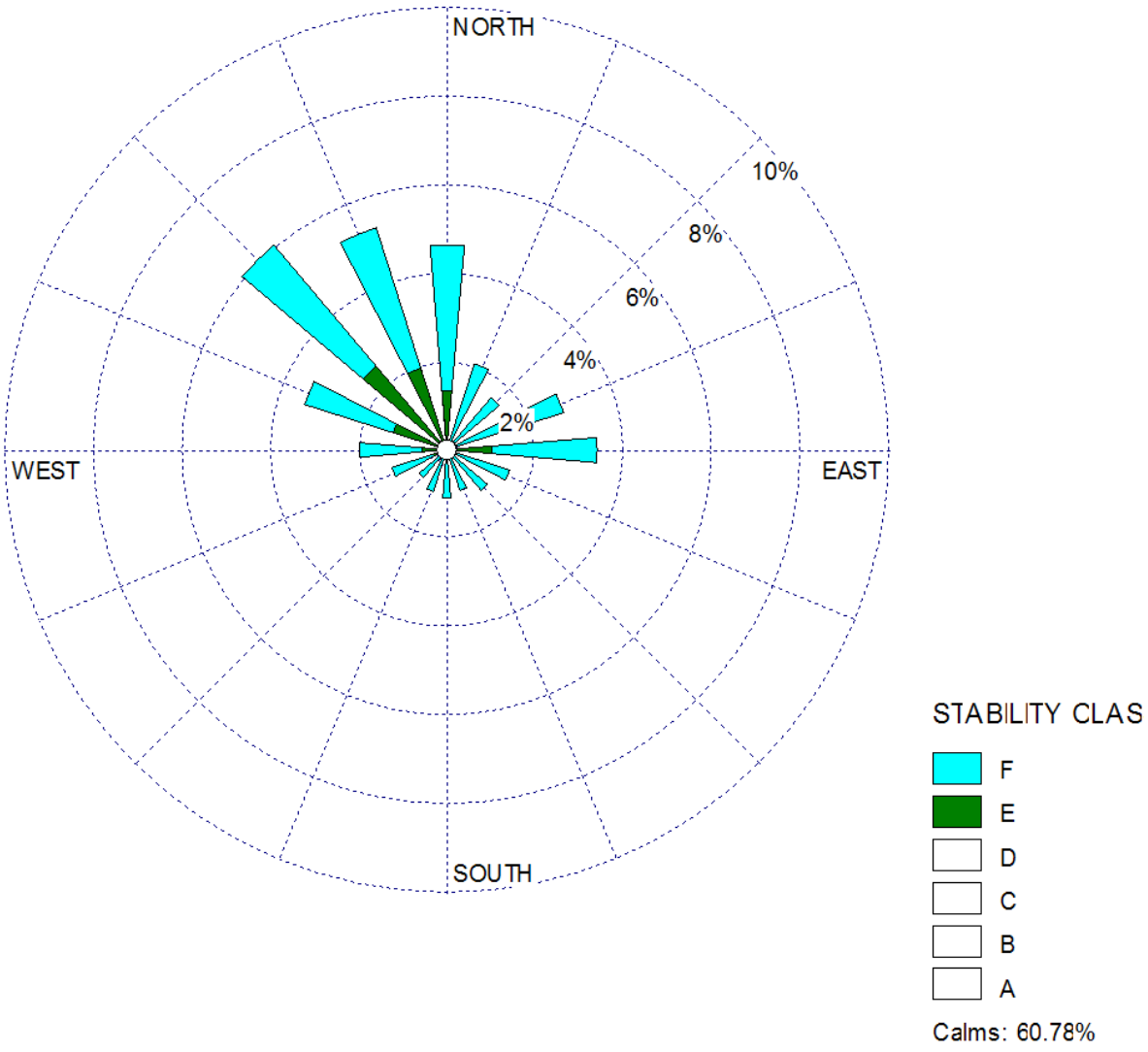



## 4.3 Atmospheric Stability – Directions of Good and Poor Dispersion

The ERPA 12 month dataset includes a measure of atmospheric stability (using the Pasquil/Gifford classification scheme – **A** (strongly unstable), through **D** (neutral) to **F** (moderately stable)). Figure 3 shows a stability rose for stable categories **E** and **F** (slightly and moderately stable respectively), and the following features can be seen:

- Higher incidences of **E** and **F** are seen from the NW and E directions. These directions provide a guide on the directions of poor dispersion; and
- A lower than average incidence of stable conditions is seen for all southerly component winds.

**Figure 4 Stability Wind Rose - Categories E&F - Pakenham 2005/2006**



# 5. Amenity Buffer for Feedmills

## 5.1 Relevant Considerations

The CEE report correctly notes (sections 3.1 to 3.3) that the industry category 'feedmill' is not identified in either the EPA buffer guidelines or the VPP Separation distances tabled in Section 52.10. However the latter reference identifies the broader industry category *'Rural industry handling, processing or packaging agricultural produce'* as attracting/requiring a 300 m separation distance. Arguably feedmills would qualify to be within this (very broad) category. Indeed the category is so broad, that it makes the blanket application of a single distance (independent of the variation in actual potential for off-site impact in the event of an upset in the industries under this category, and, for a given industry, independent of the size of an individual operation) a crude and inappropriate device.

The EPA response[7] on referral of the Hygain permit application (#T060155) also notes that *"a threshold distance of 300 m also applies for* (the category) *'grain elevators' (if applicable)"*. It is also the case that both the category 'grain elevator' and the corresponding distance 300 m is present in the EPA buffer guidelines.

Here in this category there is a direct commonality between grain terminals and feed mills – both handle grains ( though in the latter on a much smaller scale), and in both it is the emission of dust fines at the conveyor transfer points that can give rise to disamenity. The disamenity is principally deposition of dust downwind.

## 5.2 Experience with Feedmill Operations in Victoria

The CEE report refers to feedmills in Pakenham and Dandenong that produce feed for the poultry and pig industries. These were operated and owned by Barastoc, and are now operated by Ridley Agriproducts (Ridley). Ridley operate 24 feedmills throughout Australia, and five in Victoria (Pakenham, Dandenong, Bendigo, Mooroopna and Maffra). Their separation to the nearest residences ranges from 385 m (Pakenham) to ~ 50 m (Bendigo and Mooroopna), and enquiries to EPA and the relevant Councils indicate there has been no complaint in relation to feedmill dust emissions in the last 10 years.

Given that these feedmills on average have a greater throughput than that of Hygain, the extent of disamenity from dust emissions in the event of an upset/malfunction should be lower at the Officer feedmill.

Recently attempts were made to establish the annual production rates of the Ridley Feedmill at Pakenham from Council records covering a recent upgrade to the mill, but these were unsuccessful. Hence the option of derating the buffer based on the ratio of production rates could not be undertaken.

[7] EPA Letter to Cardinia Shire Council, 22 June 2006

## 5.3 Application of De-rated Buffer to Hygain Feedmill

On the assumption that the dust emission rate in the event of an upset/malfunction is proportional to the throughput at a grain elevator, and further that a feedmill can be viewed as a mini example of grain handling, then the default 300 m buffer for grain elevators can be derated to form an approximate buffer for a feedmill.

The methodology used is detailed[8] in a paper that derived from a position paper for EPA as part of a revision of the EPA buffer guidelines. Then for a large grain elevator facility of **X** tonne per year (tpy) for which the 300 m buffer applies, the reduced buffer **D** for a feedmill of **Y** tpy throughput can be given as:

$$D = \left[\frac{Y}{X}\right]^{0.56} \times 300 \qquad \text{equation 1}$$

Now the Grainco wheat terminal at Corio, Geelong has an annual throughput of 1,000,000 tpy, and taking the Hygain throughput (see section 2) at 50,000 tpy gives (from equation 1) **D** = 65 m.

Even assuming the maximum possible capacity of the Hygain plant of 100,000 tpy as the upper limit of throughput, then equation 1 gives **D** = 85 m.

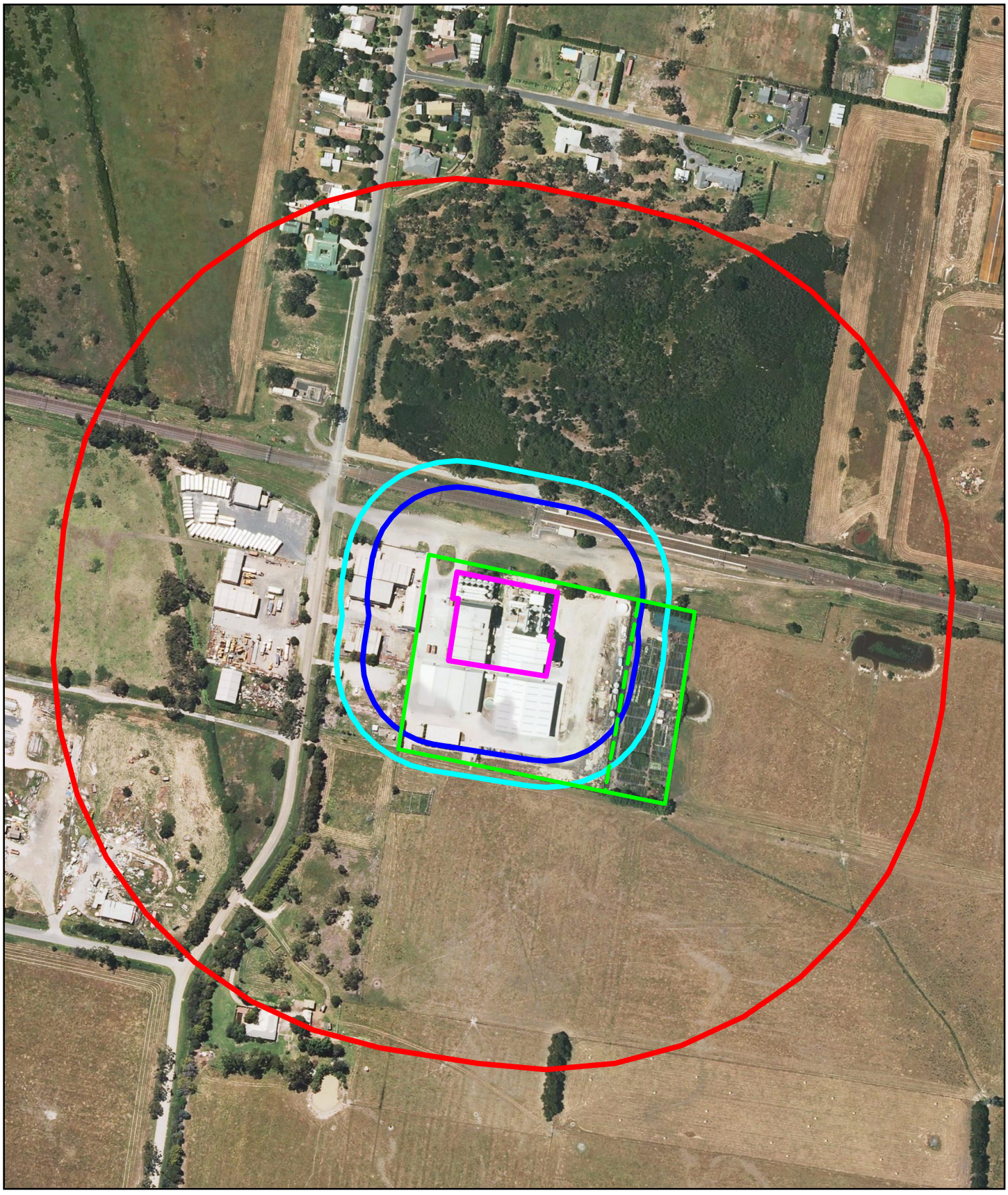
The application of both values of **D** to the Hygain operation is shown in Figure 4. It can be seen that even the 85 m buffer is largely confined within the Hygain premises site boundary to the west and south, and within the horticultural operation to the east. It is only to the north that the buffer protrudes, and then only onto the Officer station carpark.

It is acknowledged that the method used to derive **D** is only an approximate accounting for the size of the Hygain operation. A more detailed derivation of a site-specific buffer that explicitly accounts for; (i) meteorology, and (ii) plausible upset scenarios has been developed by GHD[9]. However, to apply that methodology would require the cooperation of the feedmill management, and the measurement of the dust emission rates and particle size distributions input to the cyclone, and to each of the fabric filters. It also requires the best estimates of the likelihood of failure of the fabric filters and the duration of the malfunction.

In the event this option could not be pursued, and the above formulation for **D** is considered a realistic estimate of the buffer needed for this size of operation.

[8] Clarey P, Pollock T. "Integrating Separation Distances with Dispersion Modelling" Enviro 04, 28 May -1 April 2004, Darling Harbour, Sydney.

[9] Lewis A, Pollock T. "A Method to Determine Site-Specific Buffer Distances for Upsets/Malfunctions in Industrial Premises" Enviro 06, 9 -11 May 2006 Melbourne.



**LEGEND**

- Premises Boundary
- Leased to Horticultural Supplies Firm
- Defualt 300 m buffer
- Envelope of potential odour/dust sources
- Derated 85 m buffer
- Derated 65 m buffer

1:1,500 (at A4)

0 40 80 120

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Default and Derated Buffers applied to Hygain Facility

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Figure 5

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# 6. Directionally-Dependent Buffer

Where site-representative meteorological data is available the directions of good and poor dispersion can be determined as shown in Section 3. Further, if the 12 month dataset is configured to Ausplume format (deriving atmospheric stability category and mixing height), then dispersion modelling can be conducted using a nominal source emission rate (dust or odour) to determine the directional change in extent from a fixed radial buffer.

This was done using the EPA Pakenham meteorological dataset, and adopting a nominal 10 m x 10 m area source with a nominal emission rate. The 99.5% contour that gave the same enclosed area as an 85 m radius circle (i.e. 22,700 $m^2$) was selected and plotted as shown in Figure 5. It can be seen from the figure that the extent is greater than the all-direction mean of 85 m in the southerly sector – out to 110 m. Similarly, the extent to the north is significantly less than 85 m, at down to 65 m. The contour effectively gives the departure from the fixed radius 85 m that would be needed if an equal exposure to disamenity was to be given in the event of an upset/malfunction at Hygain.

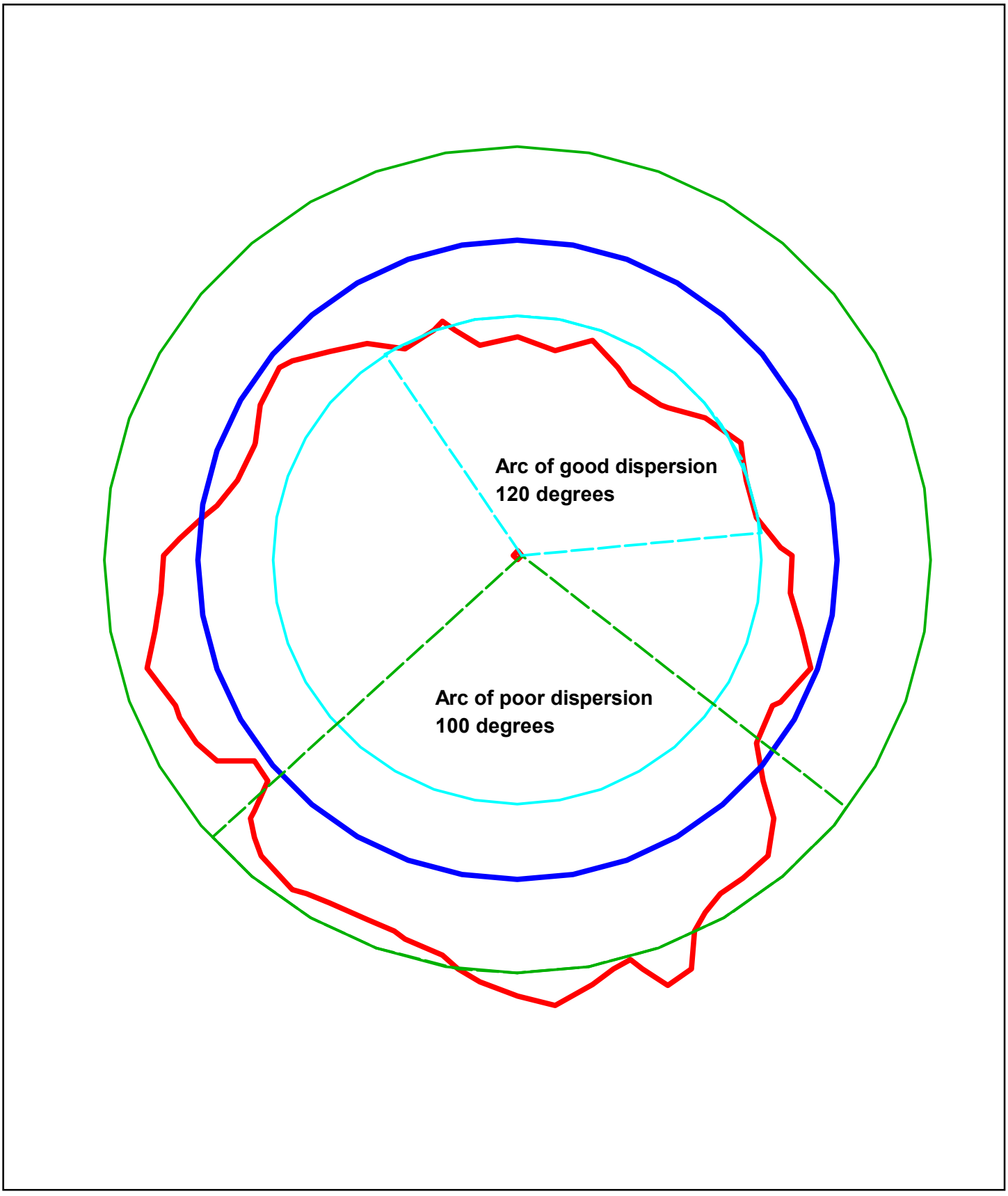
The angular change in buffer distance defined by the contour in Figure 6 is given as a function of direction Θ deg. in Table 2. This information has also been used to demonstrate the effect on the derated 85 m buffer when applied to the envelope of potential dust sources on the Hygain site – as seen in Figure 7.

**Table 2 Directional Variation in Buffer in Response to Local Meteorology – Pakenham AQMS**

| Direction, Θ Sector | deg. | Range m | % of mean range | Direction, Θ Sector | deg. | Range m | % of mean range |
|---|---|---|---|---|---|---|---|
| N | 0 | 57 | 69 | S | 180 | 117 | 142 |
| NNE | 22.5 | 60 | 73 | SSW | 202.5 | 102 | 124 |
| NE | 45 | 56 | 68 | SW | 225 | 90 | 109 |
| ENE | 67.5 | 63 | 76 | WSW | 247.5 | 100 | 121 |
| E | 90 | 73 | 89 | W | 270 | 95 | 115 |
| ESE | 112.5 | 80 | 97 | WNW | 292.5 | 80 | 97 |
| SE | 135 | 90 | 109 | NW | 315 | 80 | 97 |
| SSE | 157.5 | 111 | 135 | NNW | 337.5 | 63 | 76 |

From Figure 7 it can be seen that the derated 85 m buffer is largely contained to the east and west, and extends some 60 m onto the station carpark. It is however well clear of the existing residences on Station St north of the railway.

The situation changes somewhat for the directional buffer – the increase to ~ 110 m to the south yields an excursion of some 30 m onto VicUrban land. However the excursion is not likely to be significant in the context of dwelling placement.




**LEGEND**

- Predicted 99.5%ile impact
- Mean spread of impacts
- Mean spread of impacts - 25%
- Mean spread of impacts + 30%

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Directional buffer accounting for local meteorology

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Figure 6

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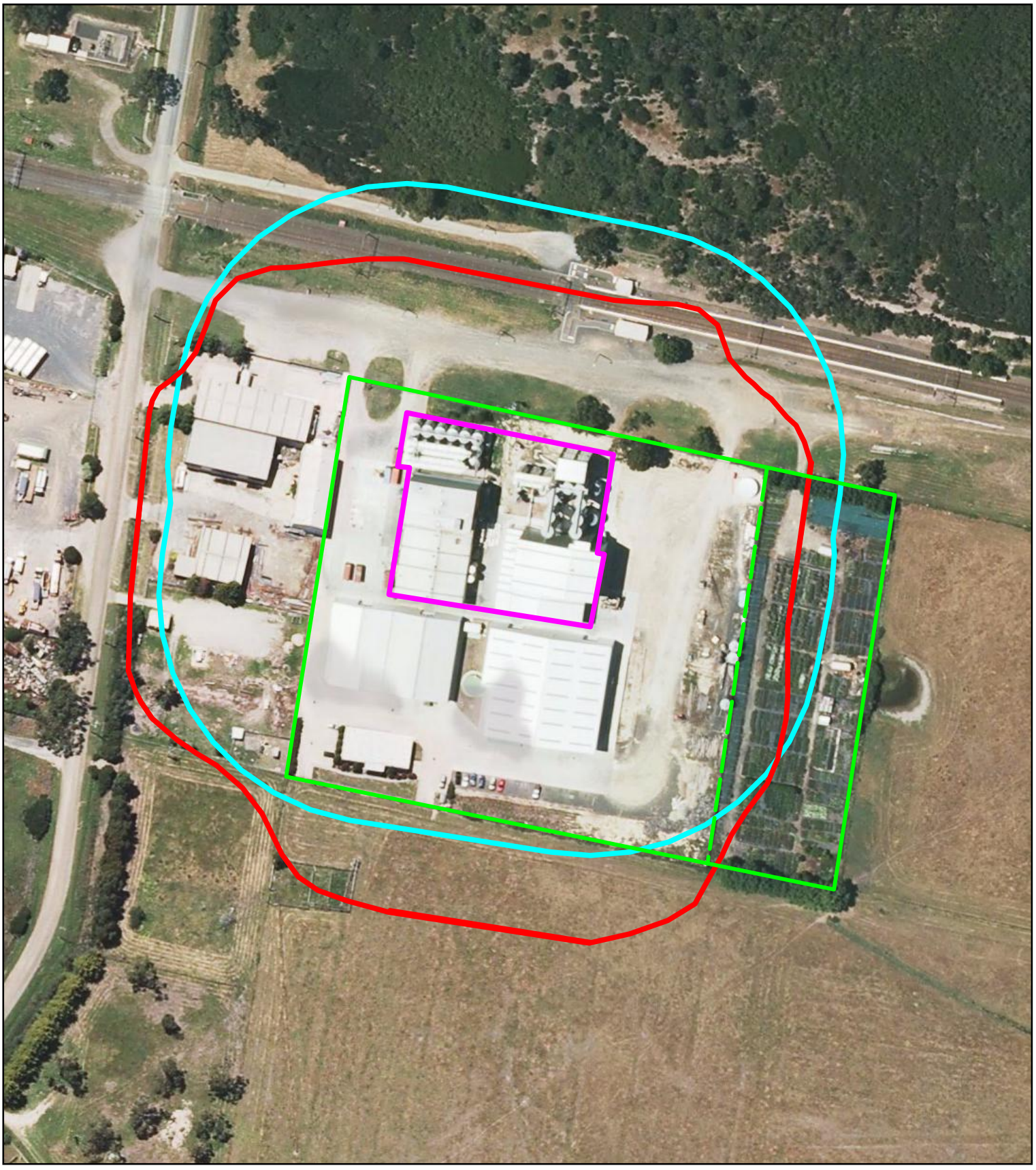

**LEGEND**

- Premises Boundary
- Envelope of potential odour/dust sources
- Directionally Dependent Buffer
- Leased to Horticultural Supplies Firm
- Derated 85 m buffer

1:2,000 (at A4)

0 20 40 80

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Directionally Dependent, Derated Buffer applied to Hygain Facility

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Figure 7

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# 7. Revised Directional Buffer

As explained in the Introduction, recent discussions were had between GHD and CEE to establish whether a compromise directional buffer could be mutually agreed. At these discussions GHD agreed that there was some uncertainty involved in assuming that the category 'grain elevator' (for which a default buffer of 300 m is specified) is also representative of 'feed mills'. GHD also accepted that the process of pro-rating would be more soundly based if it were done from a large example of a feed mill (though clearly this begs the question as to whether 300 m applies to a large feed mill).

CEE advanced the view that the aggregate mean output from all 24 mills operated by Ridley could be used, but GHD rejected that approach – were that to be accepted then the inference to draw is that EPA have derived the default buffers for only the mean sized example, and that therefore the buffer would be inadequate for those premises in the category that had throughputs greater than the mean. In GHD's view, EPA set the default buffers to minimise complaint for all but the gross outlier examples of the industry category.

Given that the annual output for a large feed mill could not be obtained, GHD decided to calculate the 'upper limit' directional buffer that would flow from acceptance of one of CEE's conclusions in their 2006 report, namely;

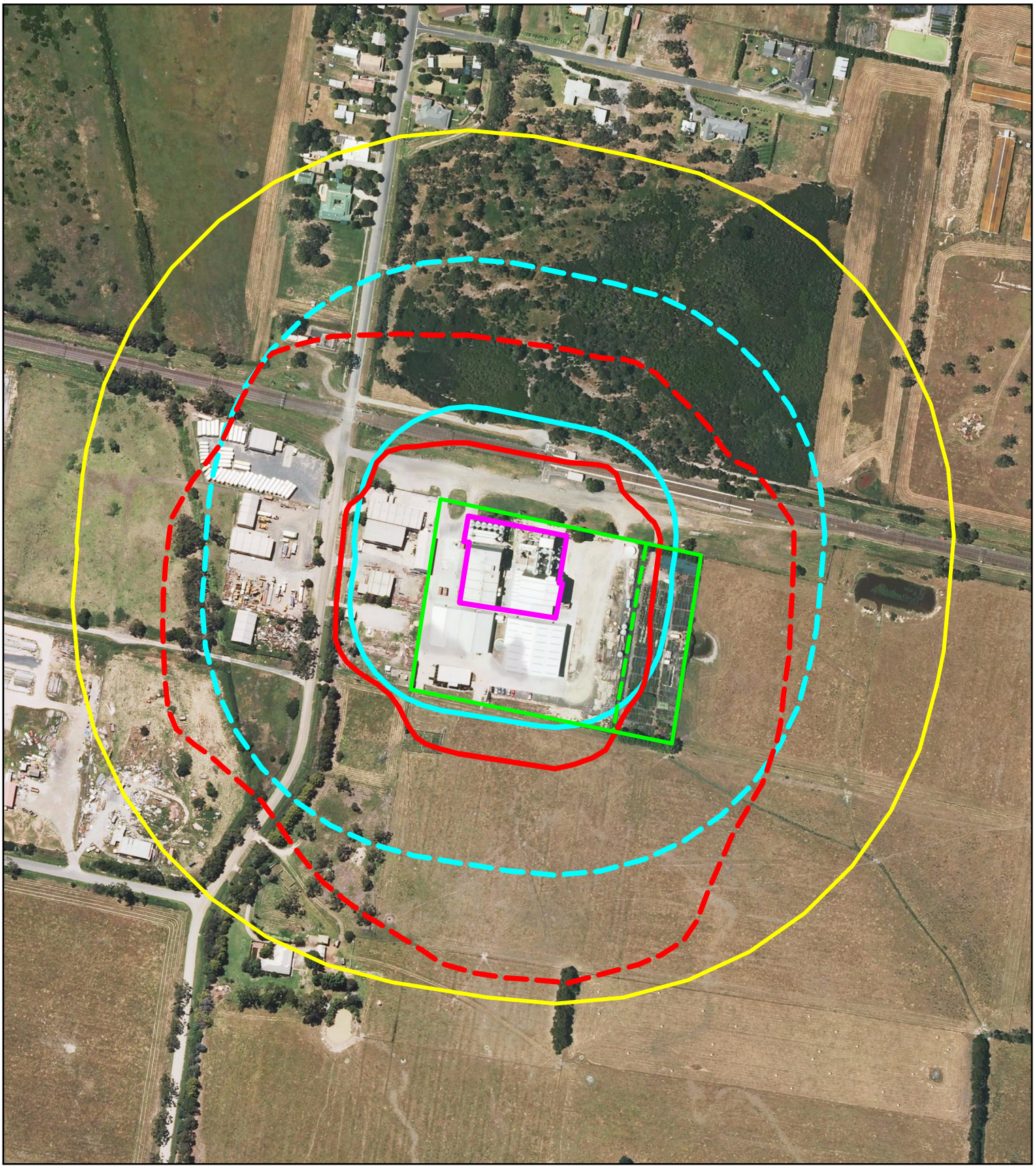
*"The subject site is located approximately 150 m from the nearest sensitive land use – a separation distance which we consider to be more than sufficient to avoid any loss of local amenity associated with emissions from the proposed (expanded) facility."*

Now, it appears (see Figure 1) that the 150 m referred to has been taken from the NW corner of the Hygain premises to the nearest lot on the west side of Station St that is zoned residential, whereas buffers are to be scribed from the envelope of potential odour sources on site (i.e. the internal buffer is counted). When the buffer is so scribed (see Figure 8) the buffer is ~ 170 m.

Then taking the exact alignment from the NW corner of the envelope (purple line in Figure 8) to the SE corner of the southern residential lot, the alignment is between NNW and NW. Table 2 gives the ratio of directional to default buffer in this direction as 0.5 x (0.76 + 0.97) = 0.86, so that the default buffer needed to generate a directional buffer in this direction of 170 m is 170 / 0.86 ~ 200 m.

The 200 m default buffer and the directional buffer based on the 200 m default buffer are shown as dashed lines in Figure 8. It can be seen that the 'upper limit' directional buffer now throws significant distances outside Hygain premises, especially to the south, and to some extent to the east.

GHD considers that this revised buffer will be acceptable to Hygain as it is consistent with their previous position as concluded in the CEE report and as detailed above. Moreover, in GHD's view the 'upper limit' directional buffer should be seen (in CEE's words) as "*more than sufficient*". Thus, where this buffer is compared to existing property boundaries, there should be no compunction to conduct minor 'trimming' of the 'upper limit' directional buffer (ie. local reduction in the buffer extent) in order to define an overlay that is coincident with property/precinct outlines.



**LEGEND**

- Premises Boundary
- Leased to Horticultural Supplies Firm
- EPA 300m (Grain Elevators)
- Envelope of potential odour/dust sources
- Derated 85 m buffer
- Directionally Dependent Buffer - 85 m
- 200 m Buffer
- Directionally Dependent Buffer - 200 m

1:4,000 (at A4)

0 40 80 120

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N

GHD

CLIENTS PEOPLE PERFORMANCE

VicUrban
Hygain Buffer Assessment

Revised Directionally Dependent Buffer applied to Hygain Facility

| | |
|---|---|
| Job Number | 31/26688 |
| Revision | B |
| Date | 12/08/11 |

Figure 8

G:\31\26688\GIS\Maps\Working\figure7.wor
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Data source: DSE Created by: MA

# 8. Conclusions and Recommendation

These conclusions should be read in conjunction with the Limitations section 9.

- The assessment has derived a reduced buffer of 85 m for Hygain operations compared to the default value of 300 m that is assigned to grain elevators, and to default separation distances of 300 m for 'rural industry handling, processing or packing agricultural produce' cited in VPP, Clause 52.10.
- The derated buffer is applicable to this site given its' low throughput compared to grain terminals. It is also consistent with the extent of dust impact observed in October 2004 when a malfunction occurred at the Hygain premises in one of the baghouses.
- There is a significant influence of local meteorology and directions of poor dispersion are directed to the south. The effect on the derated buffer (were the likelihood of dust impact in the event of a malfunction to be equalised independent of direction from the plant) is to increase it some 30% to 110 m.
- Similarly the direction of good dispersion in a fan of 120 degrees to the NNE where the buffer could be reduced ~ 25% to 65 m.
- The choice of a buffer that amounts to an almost fourfold reduction from the default value is supported by a logical methodology, and is consistent with the available buffers at other large feedmills in Victoria.
- The 'upper limit' directional buffer defined in Section 7 should provide appropriate guidance to VicUrban, GAA, Cardinia Shire in finalising the Officer Precinct Structure Plan.

It is recommended that the directional 'upper limit' buffer be applied to the Hygain site as a conservative upper limit when planning the proposed residential development on VicUrban land in the vicinity.

# 9. Limitations

This report presents the results of a buffer assessment prepared for the purpose of this commission. The data and advice provided herein relate only to the project and structures described herein and must be reviewed by a competent engineer / scientist before being used for any other purpose. GHD Pty Ltd (GHD) accepts no responsibility for other use of the data.

Where monitoring results, physical tests, data collection and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD.

The description of operations at Hygain has been based on information gathered during two visits to the site (restricted to outside the premises boundary), and on the information provided in the Planning Permit Application. Hence the assessment has been limited by the lack of access to the Hygain site, and the process description given has relied on a CEE[10] report for Hygain.

An understanding of site's environmental impact depends on the integration of many pieces of information, some regional, some site specific, some structure specific and some experience based. Hence this report should not be altered, amended or abbreviated, issued in part or issued incomplete in any way without prior checking and approval by GHD. GHD accepts no responsibility for any circumstances, which arise from the issue of a report that has been modified in any way as outlined above.

[10]CEE 2006. Proposed Expansion of Hygain Feed Mill, Officer – Air Quality Assessment. Consulting Environmental Engineers, 2 March 2006

Appendix A

# Odour Survey Field Sheet

Survey on Hygain Perimeter, 19 October 2010

# Odour Survey Field Sheet

**Operator:** ...M.Asimakis.....

**Job No:** ....31.../.26688...../.....

| | | |
|---|---|---|
| **Project: Hy Gain** | | **Address: Hickson Rd Officer** |
| **Date: 19/10/2010** | **Start Time: 10.40 am** | **Finish Time: 11.15am** |

**General Site Observations; Comments during Traverse (see also attached map):**

| Time: | Position (include street name and house number or annotate on map): | Observations/comments: |
|---|---|---|
| 10.40am | Officer Train Station (platform 1) | No detection of odour but noise very noticeable coming from Hy Gain |
| 10.45am | Corner of Station St and station car park | Grainy/biscuity odour detected – very weak |
| 10.50am | Ezibuild – along Station St | Smell of steel works/ wielding and paint also fairly noisy |
| 10.55am | Enter carpark from station st bridge | Definite grain/biscuit odour blowing towards the northwest total of about 150 m from the car park entrance. The smell is noticeable up to the last of the silos especially at the entrance to Hy Gain (the odour however is not offensive but consistent) |
| 11.05 am | Train entrance to platform 1 | Again odour of grain and biscuits is consistent and blowing towards me from the south |
| 11.10 am | On platform | No odour |
| | | |

# Odour Survey Field Sheet

**Operator:** ...M.Asimakis.....

**Job No:** ....31.../.26688...../.....

| | | |
|---|---|---|
| | **General Comments** | **Very noise in train car park from Hy Gain processing** |
| | | **The was no access to Hickson Rd – Fence was locked** |
| | | **Odour survey done only on the north and west perimeter (however winds were blowing in that direction)** |
| | | **Definite odour detected in the car park not offensive but consistent when wind blows** |
| | | |
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# Odour Survey Field Sheet

**Operator:** ...M.Asimakis.....

**Job No:** ....31.../.26688...../.....

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|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

**Weather Conditions:** Fine ☑ Overcast ❑ Light Rain ❑ Heavy Rain ❑ Other .....

**General Weather Comments: (include temperature)**

**Sun was out but partly cloudy with blue skies**

**Light to fresh breeze**

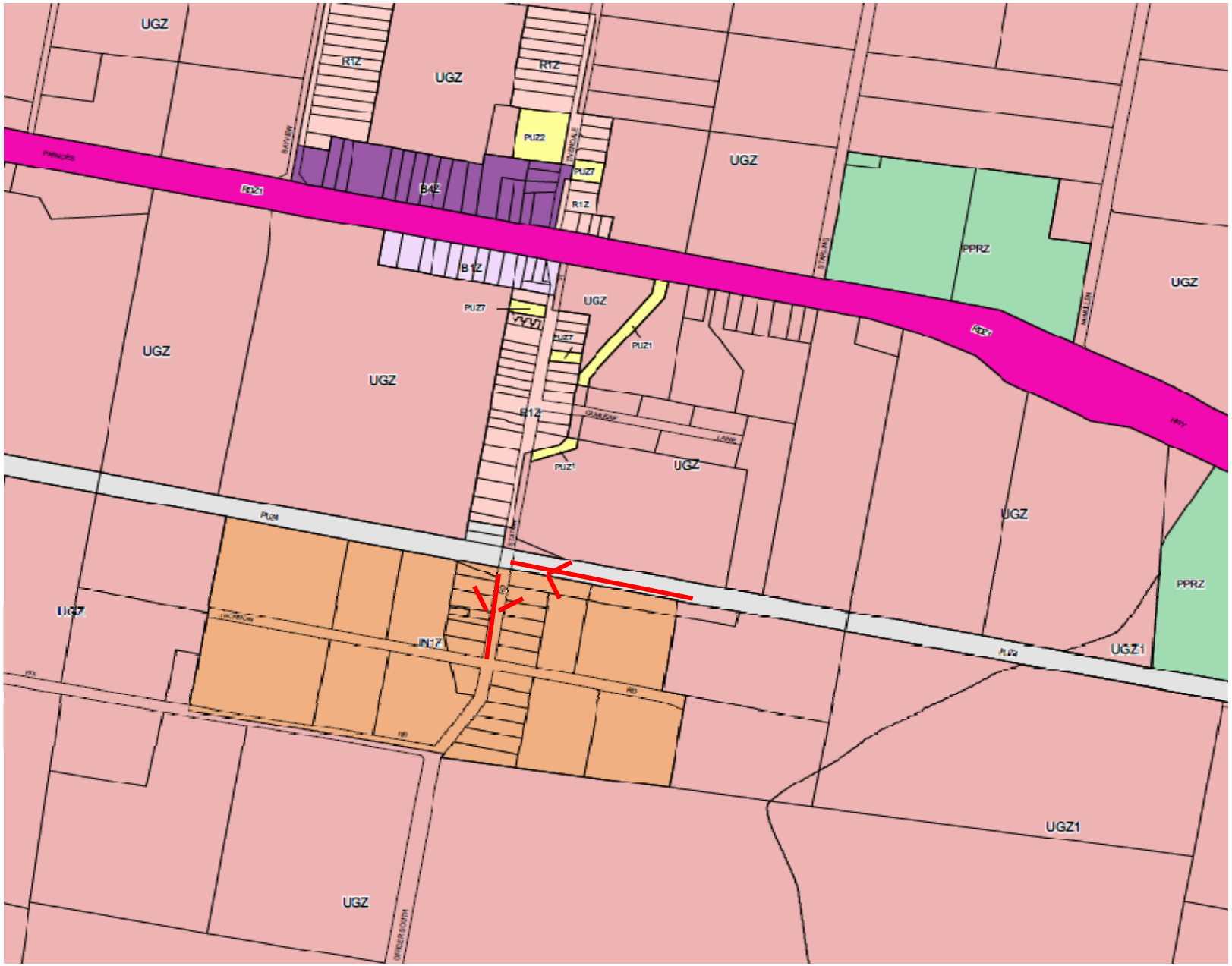
**Winds felt from E/ SE/S**

| | | |
|---|---|---|
| **Air Monitoring: Closest station is Dandenong AQMS (EPA)** | **Initial Wind Speed: 10 AM 0.7m/s**<br>**11AM 1.8m/s**<br>**12PM 2.1m/s** | **Initial Wind Direction: 10 AM 130 degrees (SE)**<br>**11AM 178 degrees (S)**<br>**12PM 212 degrees (SSW)** |

# Odour Survey Field Sheet

**Operator:** ...M.Asimakis.....

**Job No:** ....31.../.26688...../.....



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**Document Status**

| Rev No. | Author | Reviewer | | Approved for Issue | | |
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| | | Name | Signature | Name | Signature | Date |
| 1 | T Pollock | B Cook | | B Cook | | 15/08/11 |
| 2 | T Pollock | B Cook |  | B Cook |  | 07/09/11 |
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