Odour Impact Assessment

80 Silverdale Road, The Oaks

Project Number: 0294

Date: 21 October 2024

Document details	
Document title	Odour Impact Assessment
Document subtitle	80 Silverdale Road, The Oaks
Project No.	0294
Date	21 October 2024
Version	Final
Author	Sophie Hancock, Jane Barnett
Client Name	Mr & Mrs Nocera c/- Proficient Constructions (Aust) Pty Ltd

Document history

Version	Date	Author	Reviewed by	Comments
D01	19.10.2024	Sophie Hancock	Jane Barnett	Draft
F01	21.10.2024	Sophie Hancock	Jane Barnett	Final

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CONTENTS

1 INTRODUCTION

Mr & Mrs Nocera c/- Proficient Constructions (Aust) Pty Ltd, is currently in the process of preparing an application for a proposed development at 80 Silverdale Road, The Oaks, for Wollondilly Shire Council (Council). This development would constitute approximately 9 residences.

A planning proposal has been prepared, including a Land Use Conflict Risk Assessment (LUCRA). This proposal was reviewed by the Department of Primary Industries and Rural Development (the Department), who suggested to Council, in their letter dated 1 August 2024, that the LUCRA does not sufficiently address the risk of odour impact from a nearby poultry farm. This poultry farm is located approximately 750 m east of the proposed development. It is assumed that the farm contains 5,200 birds, as of a February 2024 audit noted in the Department's letter.

In their letter, the Department refer to their *Interim Buffer Guideline* (DPI, 2018) which recommends that new sensitive receivers should achieve a minimum separation of 1,000 m from poultry farms (sheds). However, the letter also acknowledges that site-specific factors should be used to determine the most appropriate distance.

The recommended 1,000 m referenced in the *Interim Buffer Guideline* notes that this value is "subject to environmental assessment in accordance with the *Best Practice Management for Meat Chicken Production in NSW* (DPI, 2012). In turn, this document refers to the *NSW Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW* (NSW DEC 2006) for a method for calculating appropriate separation distances from poultry farms. This is referred to as a Level 1 assessment in the Technical Framework and involves a simple method to identify the likely odour risk. This assessment follows this methodology, which is outlined in Section 4.

2 LOCAL SETTING

The location of the proposed development site in relation to the poultry farm is shown in Figure 2-1. The distance is approximately 750 m and there is a rise of approximately 85 m from the sheds up to the development site, which is shown in Figure 2-2.

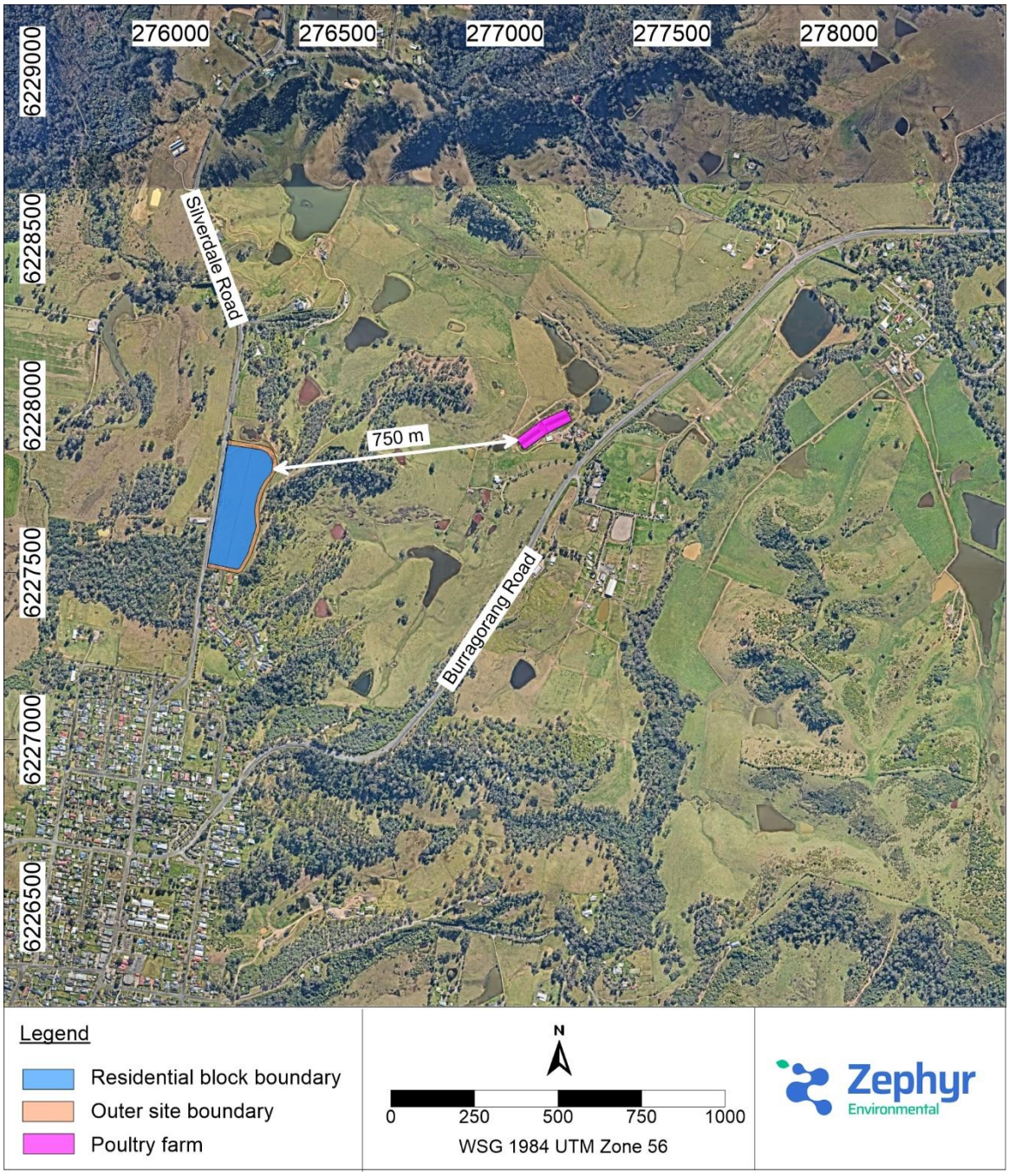

Figure 2-1: Local setting of the development site in relation to the poultry sheds

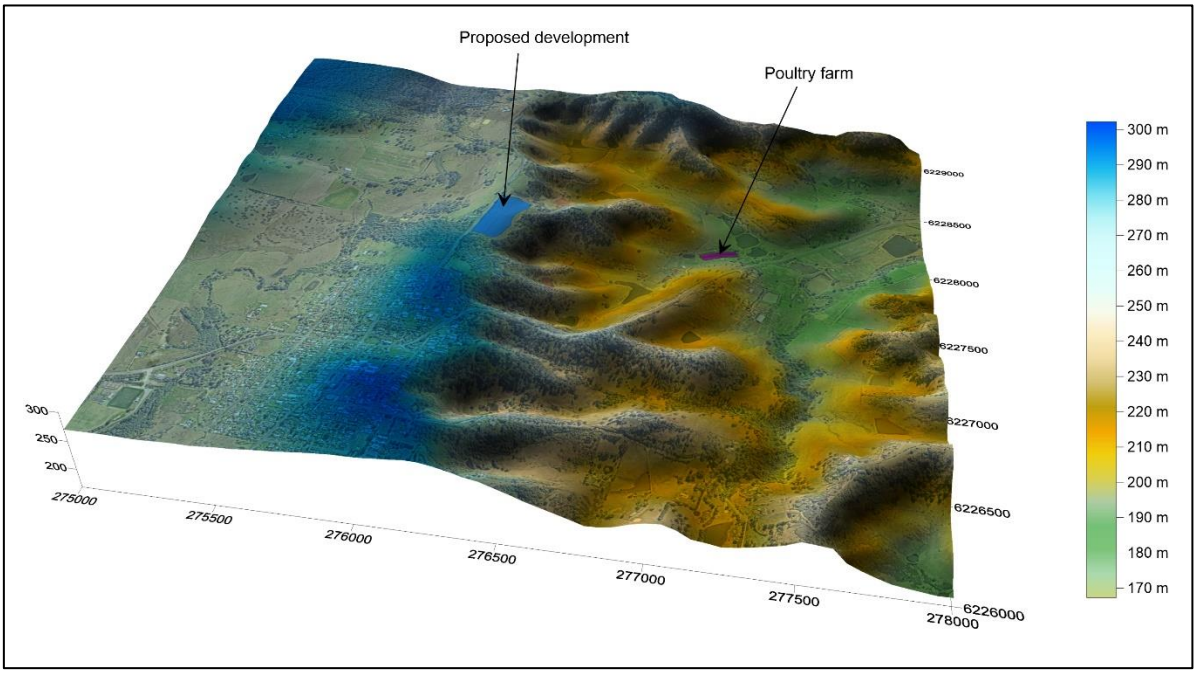

Figure 2-2: Pseudo 3-dimensional presentation of local terrain

3 METEOROLOGY

The nearest Bureau of Meteorology site is at Camden, approximately 10 km to the east of The Oaks. Figure 3-1 shows the annual windroses for Camden for the last six years. Wind directions are relatively spread throughout the compass points with the fewest winds coming from the northwest. Winds are most frequently from the southern sector. While winds from the northwest are less frequent, they represent many of the higher wind speeds, along with those from the west and southwest.

There is a significant proportion of calms, between approximately 25 – 30% across the years. Odour emissions from the poultry farms will typically remain in the valley during these times and are unlikely to move up the hills to the proposed development site.

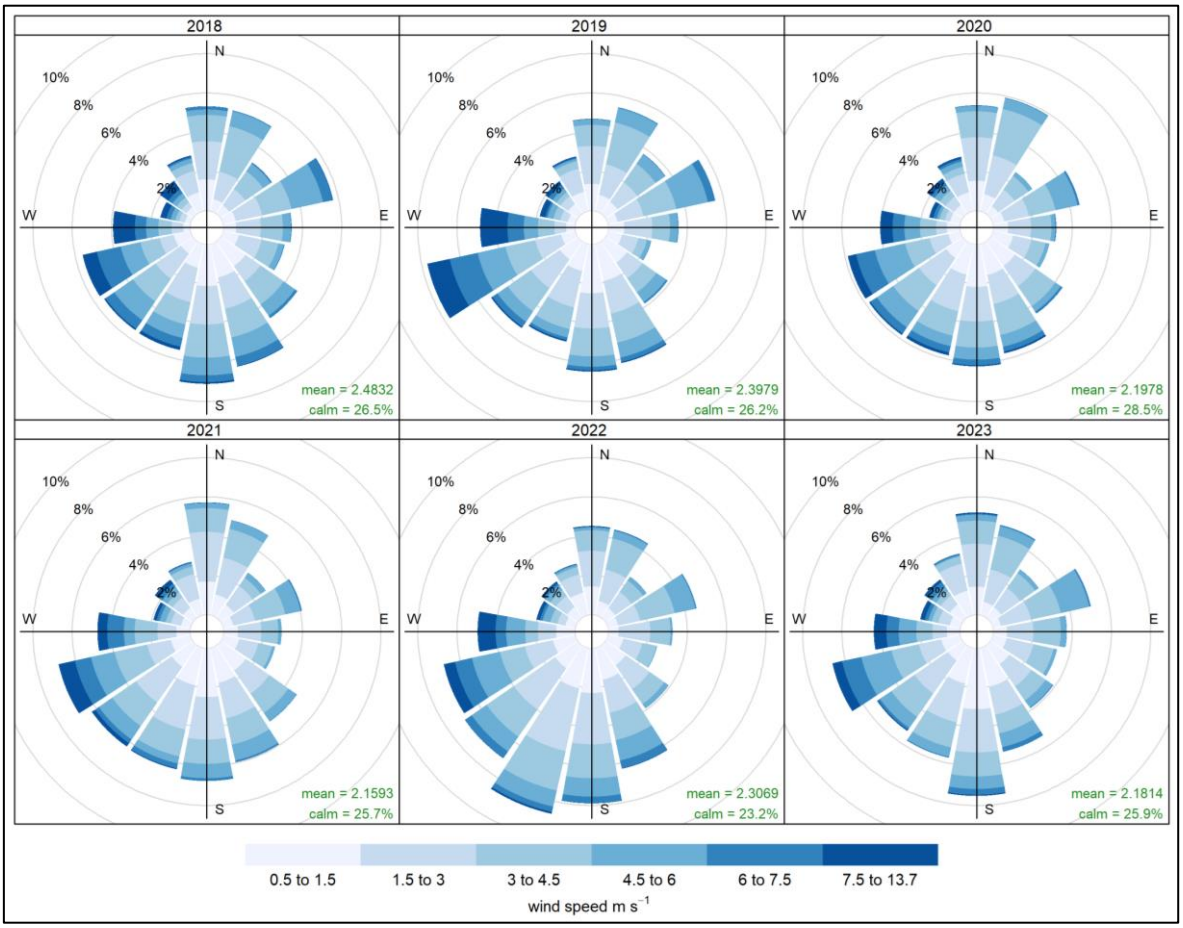

Figure 3-1: Annual wind roses for Camden 2018 – 2023

4 ASSESSMENT METHODOLOGY

The methodology used in this Level 1 odour assessment follows the guidance set out for by the NSW EPA in their *Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW* (Technical Notes) for how to calculate separation distances from poultry farms.

The objective of the assessment is to make sure the amenity of the local community is not unreasonably impacted by offensive odour. It is an assumption of the methodology that poultry farms employ current standard production technology.

The Level 1 odour impact assessment process is based on simple calculations to determine a separation distance, outside which there should not be any unreasonable impact of odour on the amenity of receptors. These calculations consider site factors such as management practices, local topography and landuse as well as the number of nearby receptors and prevailing meteorology.

The NSW EPA Technical Notes list an equation to calculate the separation distance, shown below:

$$D = N^{0.71} \times S$$

Where:

D = Separation distance

N = Number of standard poultry sheds

S = Composite site factor = S1 x S2 x S3 x S4 x S5. Site factors S1, S2, S3, S4 and S5 relate to shed design, receptors, terrain, vegetation and wind frequency respectively. Each of these are explained further in the following sections.

4.1 Number of poultry sheds

For the purposes of this methodology, a standard poultry shed is assumed to be 100 m x 13 m and contain 22,000 chickens. Where number of sheds is unknown, but number of chickens is known, the value of N may be calculated as:

$$N = number\ of\ chickens\ /\ 22{,}000$$

In the case of the current assessment, the number of chickens is known to be 5,200 based on a February 202 audit. Thus, the value of N used for this assessment could be as low as 0.24. To remain conservative the total number of sheds (4) has been used, but it should be noted that this is likely to be a significant overestimation if the number of birds is only 5,200.

4.2 Composite site factor

The composite site factor consists of five site-specific factors, accounting for shed design (S1), receptor (S2), terrain (S3), vegetation (S4) and wind frequency (S5).

For the purposes of this assessment, receptor factors were determined based on information provided by the client. Shed design, terrain and vegetation factors were determined based on a site visit conducted by Zephyr on Thursday 10 October 2024, as well as review of satellite imagery. The wind frequency factor was estimated by further processing the Camden Bureau of Meteorology (BOM) data (see Section 3).

4.2.1 Shed factor

The shed factor is determined by how the shed is ventilated, as shown in the table below.

From observations made on the site visit the sheds appeared to have natural ventilation, resulting in an S1 value of 690.

Shed type	Value
Controlled fan ventilation without barriers	980
Controlled fan ventilation with barriers	690
Natural ventilation	690

4.2.2 Receptor factor

The receptor factor is determined by the likely impact area, as shown in the table below. For towns, distance is measured from the closest part of the town boundary.

It is understood that the proposal seeks to facilitate approximately nine homes. For the current assessment, the receptor type is therefore determined to be a small town with 10 – 30 people, resulting in an S2 value of 0.35.

Receptor type	Value
Large towns, greater than 2000 persons	1.05
Medium towns, 500–2000 persons	0.75
Medium towns, 125–500 persons	0.55
Small towns, 30–125 persons	0.45
Small towns, 10–30 persons	0.35
Single rural residence	0.30
Public area (occasional use)	0.05

4.2.3 Terrain factor

The terrain factor is determined by topography and its ability to disperse odours and the different values for these factors are shown in the table below.

High relief is regarded as upslope terrain or a hill that projects above the 10% rising slope from the chicken sheds. Thus, the receptor location will be either uphill from the sheds, behind a significant obstruction or have significant hills and valleys between the sheds and the receptor.

Low relief is regarded as terrain which is generally below the 2% falling slope from the sheds. Thus, the receptor will be downhill from the sheds.

Undulating hills is regarded as terrain where the topography consists of continuous rolling, generally low-level hills and valleys with minimal vegetation cover, but without sharply defined ranges, ridges or escarpments.

A valley drainage zone has topography at low relief (as above) with significant confining sidewalls.

For the current assessment, and as per the discussion presented in Section 2, the terrain type is determined to be a high relief, resulting in an S3 value of 0.7.

Terrain type	Value
Valley drainage zone	2.0
Low relief	1.2
Flat	1.0
Undulating country	0.9
High relief or significant hills and valleys	0.7

4.2.4 Vegetation factor

The vegetation factor is determined by vegetation density, as shown in the table below. The vegetation density is assessed by the effectiveness with which the vegetation stand will reduce odour by dispersion.

Few trees, long grass is regarded as open country with a permanent covering of grass or pasture of around 1 m or more in height and with a light scattering of timber which is distributed continuously across the buffer area.

Wooded country is regarded as open forest country with tree density not sufficient to provide a continuous canopy, but sufficiently dense to influence air movement. There would be little or no lower storey vegetation.

Heavy timber is regarded as tall forest areas with dense timber stands providing a continuous canopy. There is limited understorey vegetation, mainly associated with regrowth.

Heavy forest, upper and lower storey is regarded as dense layers of taller timber with an interlocking canopy and with extensive amounts of lower storey vegetation of various species resulting in almost complete ground cover and a dense upper canopy.

For the current assessment, the vegetation type is determined to be few trees, long grass, resulting in an S4 value of 0.9.

Vegetation type	Value
Crops only, no tree cover	1.0
Few trees, long grass	0.9
Wooded country	0.7
Heavy timber	0.6
Heavy forest (both upper and lower storey)	0.5

4.2.5 Wind frequency factor

The wind frequency factor is determined by the proportion of time that winds blow towards the receptor, as shown in the table below. Wind speed and direction vary annually and diurnally. Although there is generally one direction that is the most frequently observed (prevailing wind), the wind direction usually blows from all directions at some time.

The wind can be classed as high frequency towards the receptor if the wind is blowing towards the receptor (± 40 degrees) with a frequency of at least 60 % of the time for all hours over a whole year.

The wind can be classed as low frequency towards the receptor if the wind is blowing towards the receptor (± 40 degrees) with a frequency of less than 5 % of the time for all hours over a whole year.

An analysis of the Camden meteorological data, the frequency of winds from the east (± 40 degrees) towards the proposed development is approximately 12%. While this is relatively low, it is greater than the 5% noted above to define low frequency. Therefore, for the purposes of this assessment, the wind frequency is determined to be normal, resulting in an S5 value of 1.0.

Wind frequency	Value
High frequency towards receptor (greater than 60%)	1.5
Normal wind conditions	1.0
Low frequency towards receptor (less than 5%)	0.7

4.3 Calculation of separation distance

For the current assessment, the separation distance is thus calculated based on the following values:

Factor	Value
Shed factor (S1)	690
Receptor factor (S2)	0.35
Terrain factor (S3)	0.7
Vegetation factor (S4)	0.9
Wind frequency factor (S5)	1
Composite site factor, S (S1 x S2 x S3 x S4 x S5)	**152**
Number of standard poultry sheds (N)	**4**

Using Equation 1 ($D = N^{0.71} \times S$), this results in a separation distance calculation of 407 m. This is does not reach the proposed development location, as shown in Figure 4-1.

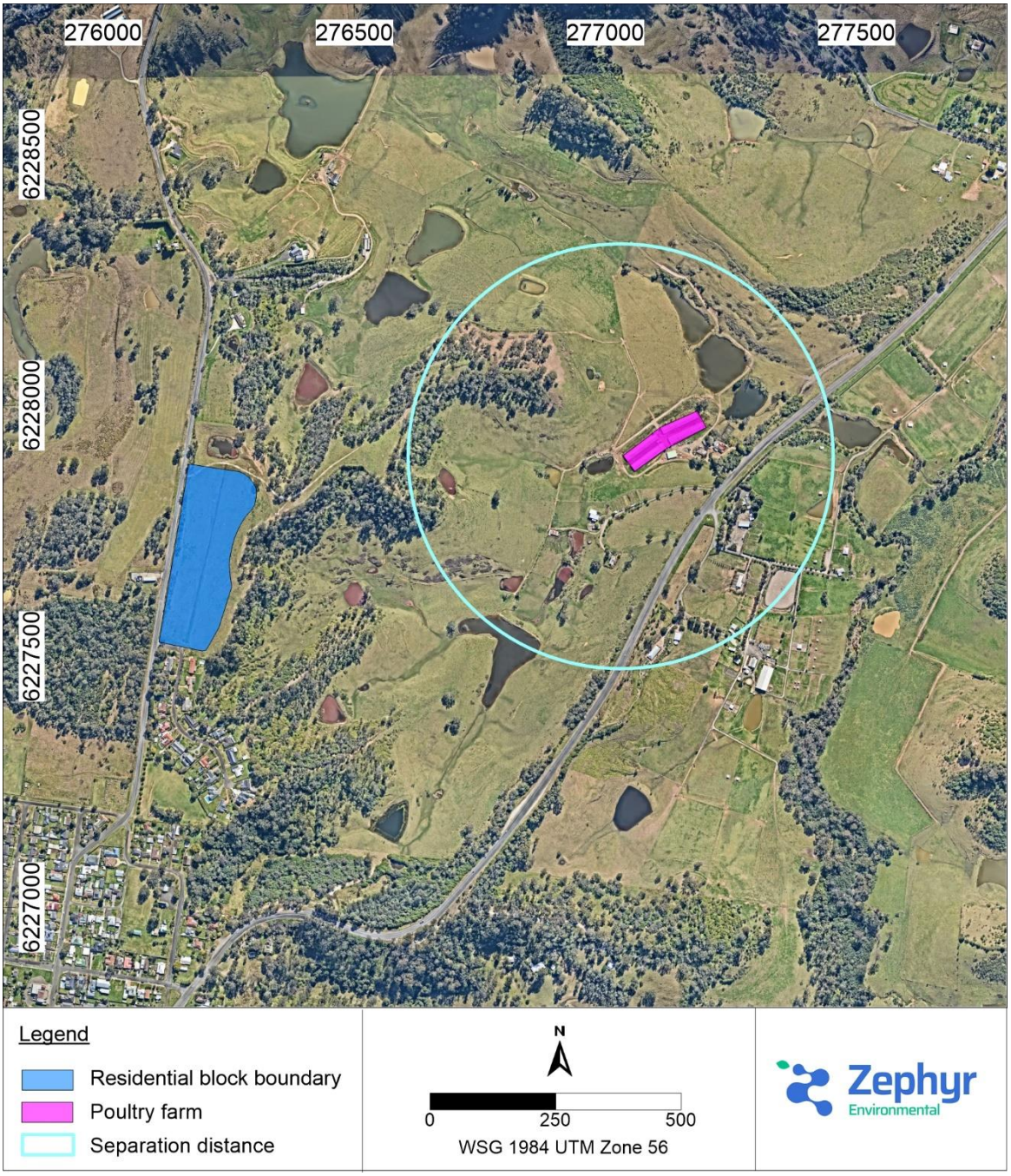

Figure 4-1: Separation distance of approximately 407 m from the western sheds

5 CONCLUSIONS

Mr & Mrs Nocera c/- Proficient Constructions (Aust) Pty Ltd is preparing an application for a proposed development at 80 Silverdale Road, The Oaks. This development would include nine residences.

In line with government guidance, a Level 1 screening assessment has been completed to determine the likely risk of odour impacts at this location due to a small poultry farm approximately 750 m to the west of the development site.

A site inspection was carried out to understand the local site factors so these could be used to complete the assessment. The screening assessment determined that the appropriate separation distance would be approximately 407 m and as a result the farm would be unlikely to cause adverse odour impacts at the development site.

6 REFERENCES

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