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File: 585573-4

Doc No:

Action: Shane Murphy ☐

Application: Com/130/2008

Description: Submission in Objection by Teys Bros (Holdings) Pty Ltd.

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Scanned Date

Received by
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Date: 25/5/2009

By: KW

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11 May 2009

The Chief Executive Officer
Logan City Council
P O Box 3226
Logan City DC QLD 4114

Dear Sir/Madam

Council Application Number: COM/130/2008

We refer to the above-numbered Development Application (DA) and lodge this submission objecting.

The DA concerns an area that is in close proximity to cattle holding yards belonging to Teys Bros (Beenleigh) Pty Ltd. Residents living in close proximity to the cattle holding yards will have a reduced amenity to that experienced in a typical residential setting as issues such as noise, odour and Q Fever arise.

Noise & Odour

Cattle are unloaded into the holding yards up until midnight each night before an operating day, i.e. Sunday through to Friday, and again from 5am. This will result in an increase in noise and odour levels whilst the animals are being unloaded and settled.

Existing residents living in close proximity to the abattoir for many years are aware of the reduced amenity that is a by-product of residing close to industry. This is not the case for new residents however, who may expect the amenity experienced in a typical residential setting.

It is Teys' experience that residential encroachment results in an increase in complaints to the company and/or to the Environmental Protection Agency (EPA). Each and every complaint made to the EPA is investigated by the EPA even if one person makes multiple complaints about the same issue. This results in increased administration and cost to the company.

Q Fever

Q Fever is a disease caused by the organism *coxiella burnettii* which can be contracted from infected animal faeces, urine etc. The infected by-product breaks down into the dust and the organism becomes airborne. Whilst Teys have undertaken measures to reduce the risk of infection to residents, such as sprinkling the yards to reduce dust emissions, the risk is more appropriately reduced via maintenance of adequate buffer zones.

Studies into this area contain recommendations that a distance of 500m from residences is maintained to reduce the risk of Q Fever infection. In support of this we enclose: an extract from the *Investigation of Residential Development Report*[1], prepared for Consolidated Meat Group Pty Ltd in relation to the Lakes Creek Abattoir; an extract from *Environmental Guideline Abattoirs*[2]; and *Planning Guidelines – Separating Agricultural and Residential Land Uses*[3]. Also enclosed is a map[4] showing the position of the cattle yards in relation to the proposed development.

We welcome a meeting with Council to discuss the above issues and take this opportunity to explain that we consider ourselves a highly responsible corporate citizen. We are constantly striving to reduce any negative impact on the local community. In addition to this, we regularly donate to and sponsor local community groups, services and sporting clubs. We employ over 900 people at our Beenleigh operation and expend approximately $ 33 million per annum in wages.

Urban encroachment is a serious concern to Teys as the growth of residential development ultimately impinges on our long term viability.

Yours sincerely

Kirsty Jackson
Company Secretary

1 See Appendix 1
2 See Appendix 2
3 See Appendix 3
4 See Appendix 5

Table 1 - Guideline Buffer Distances

Activity	Authority	Nuisance	Buffer requirement (metres)
Holding yards	DoE	Odour	2000
Holding Yards	DPI	Odour	1500 head - 3,900
			2000 head - 4,500
Rendering Plant	DoE	Odour	1000

It is considered that the development of residential uses in the proposed rezoning area will lead to reduced amenity levels due to odour and complaints of environmental nuisance.

6 DUST

Like odour, dust can occur from the normal operation of the meatworks. Although the meatworks is meeting Environment Protection Act requirements, it is still possible for emissions of dust to occur from the movement, unloading and transfer of cattle. The majority of these effects occur at the holding yards on the east of the meatworks site directly adjacent to the proposed development area. Guideline recommendations recommend the closest distance for a conflicting use should be a minimum of 500 metres. This scale of separation will allow dispersion and settling of dust. The existing land is currently acting in this capacity for the greater residential area to the North and west, the direction of the prevailing wind in Rockhampton. The redevelopment of this land for residential purposes will bring 250 to 300 additional lots into direct contact with a conflicting land use and dust producer. Dust is an identifiable and environmental nuisance which is likely to lead to complaint without an effective buffer.

7 SOLID WASTE

7.1 Manure/Q-Fever

The operation in the holding yards includes storage of in excess of 1,500 cattle per day. This area directly abuts the boundary of the proposed residential rezoning. Manure from the cattle provides a vector problem in the form of flies and vermin and is the transmittal medium for Q-Fever. There are obvious inherent health problems in locating residential habitats in close proximity to this. The stock utilising the holding area are changed on a daily basis from all over Queensland.

Q-fever is a health problem associated with cattle and is transferred from cattle manure. The meatworks is currently implementing methods to reduce and/or eliminate Q-Fever through a vaccination program with its employees. The further development of residential housing in close proximity to the holding areas will increase the public health risk and will again increase pressure to remove the abattoir. The increase in this substantial health risk can be avoided by the enforcement of reasonable buffer zones around the existing holding yards.

The protection of public health and reduction or minimisation of possible health risks should be a priority in the future planning and development of Rockhampton. Ensuring an adequate health related buffer is maintained is a suitable and substantial move in this direction. The proposal for a buffer down to a minimum of 20 metres is not considered suitable and a minimum of 500 metres is necessary to provide a reasonable separation.

Corrective measures to ameliorate this situation are not possible with the exception of removal of the meatworks. Based on stress to the animals and animal welfare considerations, it is not acceptable to hold animals on concrete or in covered yards for extended periods.

8 NOISE

Noise at the meatworks is generated from several sources. These include stock transport vehicles, stock unloading, stock storage, cattle movement and plant machinery noise. Of particular concern for adjoining residential purposes would be night-time bellowing of cattle and operational noises.

Typical noise levels associated with these are provided in Table 2 below. Table 3 provides typical background noise levels for residential areas.

Table 2 - Typical noise levels at various distances (Tonal)

Equipment or Process	$L_{Amax,T}$ dB(A) (100m)	Typical $L_{Amax,T}$ dB(A) (100m)	Typical $L_{Amax,T}$ dB(A) (200m)	Typical $L_{Amax,T}$ dB(A) (300m)	Typical $L_{Amax,T}$ dB(A) (400m)
Truck pick up and delivery	51 - 73	62#	56#	48*	38*
Cattle bellowing		58#	52*	44*	34
Front end loader	63 - 71	67#	61#	53*	43*
Plant and fan noise	55 - 69	62#	56#	48*	38*
Truck and forklifts	51 - 73	62#	56#	48*	38*

\# Sound pressure level exceeding 5 dB(A) above background for all hours.

* Sound pressure level exceeding 3 dB(A) above background for 10:00pm to 7:00am time period.

Table 3 - Typical Residential Noise levels

Type of Use	$L_{Amax,T}$ dB(A)
Assumed background Noise Levels for rural and urban residential areas 7:00am - 10:00pm	45 - 55 (50 Used)
Assumed background Noise Levels for rural and urban residential areas 10:00pm - 7:00am	30 - 40 (35 Used)

In general, the background noise level for a residential area would range from a minimum of 30 dB(A) at night up to around 50 dB(A) during early morning and late in the evening.

The Environment Protection Act specifies maximum noise levels for noise sensitive places (residential) as shown in Table 4.

Table 4 - Maximum Noise levels

Period	**Noise level for noise sensitive place**
7:00 a.m. to 10:00 p.m.	background noise level plus 5 dB(A)
10:00 p.m. to 7:00 a.m.	background noise level plus 3 dB(A)

Based on the figures in Tables 2, 3 and 4, an estimated buffer distance for noise can be estimated. This represents the buffer zone requirements to meet current interim regulations under the EPA. The majority of the proposed development site will not meet this requirement.

No actual sound measurements have been taken on the site, however typical values have been obtained from Department of Environment guidelines and other literature and the subsequent calculations made have been based on noise and pollution control data from Deakin University Environmental Engineering information.

The values used are averages and would be exceeded in some situations and operations dependent on the plant used. Maximum values have not been applied. Although in the example above, forklift operation provided the greatest average sound level, if the same estimate was completed with a peak noise pressure for truck unloading (73 dB(A)), the necessary buffer distance required to meet the night time 3dB(A) sound pressure increase would be 500 metres.

Based on the above, it would be reasonable to expect that a minimum buffer zone of 500 metres be applied for operations at the plant including stock handling, to ensure that legislative values for noise are not exceeded. Any buffer zone of less than this

- major plant communities
- the status and conservation significance of vegetation
- the occurrence of any rare or threatened species
- the presence of any introduced species.
- heritage or cultural sites

Heritage and sacred sites listings should be checked before a decision on the proposed development is made.

10.1.3 Buffer zones

Buffer zones are particularly important as measures to separate conflicting land uses and to minimise any harmful effects of new developments in environmentally sensitive areas. Even if other control measures are used, odour, dust and noise emissions may still occur. Adequate buffer distances from nearby land uses are the best way of avoiding nuisance from air and noise pollution. Occupiers should include buffers in management strategies and local governments should include them in town planning approvals. New buffer zones should be created as part of the proposed development.

Buffer distances are cheap control options if additional land does not have to be purchased. Zoning buffers could be green space, or business uses which can occupy land near residential areas without causing problems themselves.

Planning and design must allow for changing conditions. The use of buffers needs to be balanced against possible future changes to the surrounding land use. For example, future development may bring neighbours closer to the development/land use, and other more effective control measures may become necessary.

Even when control measures are fully implemented, pollutant emissions can still occur. Adequate buffer distances from residents are the best way of avoiding nuisance arising as a result of air and noise pollution. Occupiers should include buffer distances in management strategies and local governments should include them in town planning approvals.

A minimum buffer distance to the nearest residence or residential area of 1000 metres is recommended downwind of an abattoir, dependent on prevailing winds, and may need to be increased if effective and reliable odour control equiptment is not installed.

10.1.4 Visual environment

The choice of aesthetically pleasing colours and finishes will enhance the look of premises. Features such as trees, shrubs, rock walls and grassed slopes incorporated into the landscaping will not only help with the visual impact, but also diminish the effect of operational lighting beyond the boundaries of the premises. Planting may also assist in dust control. Planted buffer zones can also serve as wildlife corridors.

Noise may not be reduced by plantings. However, earth banks may reduce noise if the source is close to the banks and the banks are high enough.

Endemic species are recommended for plantings as they will provide a habitat for birds and animals native to the area. Early plantings should be organised at new sites.

10.1.5 Contaminated land issues

Once waste streams, process operations, raw materials, fuel supplies and product ranges have been identified, the methods of storing and handling materials and ways of segregating, treating and disposing of wastes must be addressed to minimise the potential for land contamination and air and water pollution. Underground tanks can leak into soils for long periods before being detected, leading to high clean-up costs.

Planning Guidelines

Separating Agricultural and Residential Land Uses

Department of Natural Resources, Queensland
Department of Local Government and Planning, Queensland
DNRQ 97088

These planning guidelines are to be read in association with *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*

Design and production by Scientific Publishing, Resource Sciences Centre, DNR

ISBN 0 7242 7405 7

DNRQ 97088

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Resource Sciences Centre
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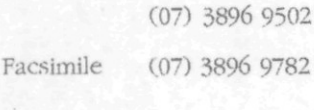

Preface

State Planning Policy 1/92: Development and the Conservation of Agricultural Land was approved by the Queensland Government in December 1992, under the *Local Government (Planning and Environment) Act 1990-1992*. State Planning Policy 1/92 addresses key principles for the protection of agricultural land. The policy is supported by planning guidelines which provide detailed advice on implementing the policy.

Planning Guidelines: The Identification of Good Quality Agricultural Land was released in 1993 and addressed the definition and identification of good quality agricultural land and appropriate planning approaches to achieve the protection of such land.

Planning Guidelines: Separating Agricultural and Residential Land Uses provides technical advice and guidance to local government, developers, consultants and landholders on minimising conflicts between farming activities and residential uses (Policy Principle No. 8 of State Planning Policy 1/92). The planning guidelines are a product of extensive public consultation: two drafts were published (1993 and 1995), and the document has been substantially amended in response to comments received. In particular, the document advocates a flexible approach that is responsive to specific circumstances.

Planning Guidelines: Separating Agricultural and Residential Land Uses has been prepared by the Department of Natural Resources and the Department of Local Government and Planning in consultation with a reference group formed from representatives of the following bodies:

Local Government Association of Queensland

Queensland Farmers' Federation

CANEGROWERS

Australian Cotton Foundation

Queensland Pork Producers' Organisation

Queensland Dairy Farmers' Organisation

Queensland Fruit and Vegetable Growers

Queensland Grain Growers' Council

Queensland Conservation Council

Australian Sugar Milling Council

Urban Development Institute of Australia

Royal Australian Planning Institute

Land Resource Consultants

Department of Environment

Department of Primary Industries

Contents

1. Introduction

1.1 *The Queensland Government considers that good quality agricultural land is a finite national and state resource that must be conserved and managed for the longer term.*

State Planning Policy 1/92: Development and the Conservation of Agricultural Land (SPP1/92) was introduced in December 1992 as an instrument to protect good quality agricultural land through local government planning. SPP1/92 Principle No 8 states:

Local Authority planning provisions should aim to minimise instances of incompatible uses locating adjacent to agricultural operations in a manner that inhibits normal farming practice. Where such instances do arise, measures to ameliorate potential conflicts should be devised wherever possible.

Purpose

1.2 The purpose of the planning guidelines is to provide technical advice and guidance on reducing the potential for conflict between farming activities and residential development in accordance with Principle No. 8 of State Planning Policy 1/92. The planning guidelines are intended to assist local governments, developers, landholders and consultants. In particular, the planning guidelines contain provisions which local governments should consider including in their planning schemes or adopting as local planning policies.

1.3 Although intended to support the protection of good quality agricultural land in accordance with State Planning Policy 1/92, the principles in the planning guidelines could be used to assist decision-making on other land where agricultural/residential conflicts could arise. Also, the principles can be applied to situations where conflicts are likely to arise between industrial, tourist, commercial or other urban uses and nearby agricultural uses.

1.4 It should be noted that conflict due to intensive animal industries is not specifically covered in these planning guidelines. Detailed guidance on dealing with the impact from these activities is provided in industry-specific codes of practice and guidelines which are listed in the reference section of this document.

Background

1.5 Conflict between residential development and agricultural land uses is likely to occur where residential land uses directly abut, or are sufficiently close to, farmland such that they are likely to be affected by agricultural activities.

1.6 Such conflict can arise from the use of agricultural chemicals, and noise, dust and odour generating activities. Adverse impacts of residential development on farmland include sediment and stormwater run-off. These planning guidelines outline planning measures to reduce such land use conflict.

The Environmental Protection Act

1.7 The *Environmental Protection Act 1994* (EP Act) was introduced by the Queensland Government primarily to protect the environmental values of air, noise and water. Under the EP Act and associated Environmental Protection Policies (EPPs), everyone has a general environmental duty of care to the environment and their neighbours.

1.8 Advice in the planning guidelines is based on certain assumptions:

(a) All agricultural activities incorporate reasonable and practicable measures to protect the environment in accord with the Environmental Code of Practice for Agriculture (prepared under the provisions of the EP Act) and associated industry specific guidelines.

(b) All agricultural activities are legally conducted as required by other legislation covering workplace health and safety, and the use and handling of agricultural chemicals.

(c) Nevertheless, certain activities practised by even the most careful and responsible farmer may result in a nuisance to adjacent residential areas through, for example, unavoidable odour drift and noise impacts.

1.9 The separation distances recommended in this document are drawn from relevant State and Commonwealth legislation and guidelines, notably the EP Act, relevant research and the sources cited.

The Use of Buffer Areas

1.10 Buffer areas are legitimate planning tools. They are used to separate land uses to ensure long-term protection of both areas impacted upon and areas used for the conflict generating activity. Examples of such activities include sewage treatment works, abattoirs, tanneries, composting plants and rendering works; and intensive animal and plant production facilities (such as feedlots, piggeries and poultry sheds). The principle of separating conflicting uses is also applied to the protection of natural resource areas (such as nature conservation reserves, streams, water supply storage areas and forest reserves).

1.11 By separating agricultural uses from residential and other urban uses, buffer areas can reduce conflict and the resulting complaints. Complaints about agricultural practices are often based as much on perception as reality, particularly in relation to chemical spray drift. Seeing or smelling the source of nuisance may heighten the perception of that nuisance. Buffer areas can contribute to the screening of agricultural activities from the view of residential areas. Thus a suitable visual barrier between the development and agricultural land in the form of a vegetation screen can significantly reduce the level of complaint by minimising both the cause and the perception of a nuisance.

1.12 Nevertheless, buffer areas designed in accordance with these planning guidelines will not totally eliminate all impacts of activities. Also, the planning guidelines do not limit the rights of individuals to take action under the common law or such legislation as the *Health Act 1937, EP Act 1994, Work Place Health and Safety Act 1995* or the *Agricultural Chemicals Distribution Control Act 1966*, if they believe their rights to enjoy a safe environment and the use of their land are restricted. Appendix 1 outlines existing controls and administering agencies for a range of issues.

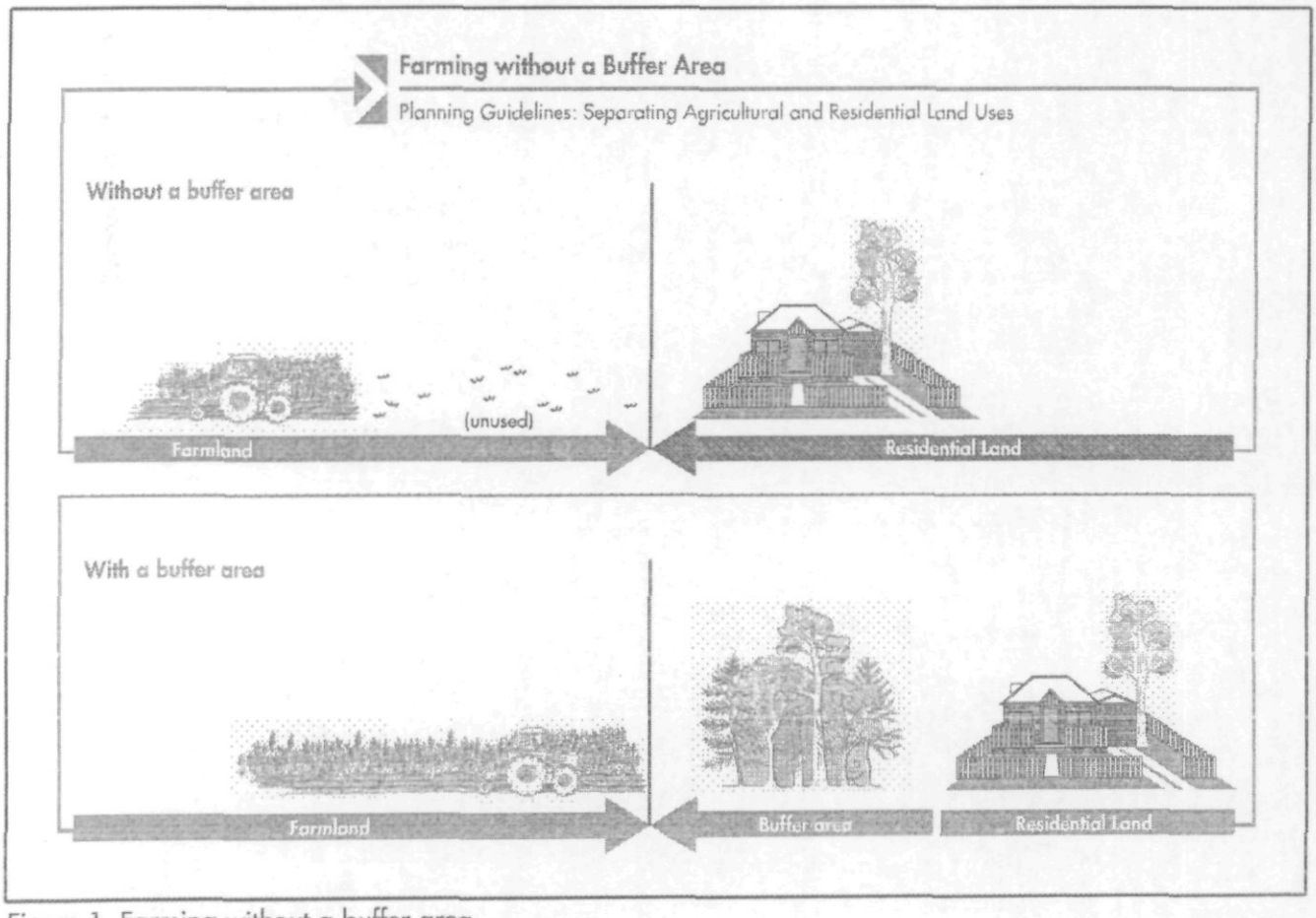

Figure 1. Farming without a buffer area

Principles

1.13 The planning guidelines should be applied with consideration to the following principles:

1. Provided agricultural practices are legally practised according to existing codes of practice, it is unreasonable for new adjacent uses to demand a modification of these practices to an extent which threatens efficient agricultural operations.
2. When preparing planning schemes, local governments should avoid, as far as practicable, locating residential development in close proximity to agricultural land. Where this is not possible, mechanisms such as buffer areas should be used to minimise conflicts.
3. Buffer areas should be determined on the basis of the sustainable agricultural land use with the potential to have the most impact on adjacent land uses and which is reasonably likely to be practised, regardless of current use.
4. Buffer areas should be located within the site being developed for residential purposes, and be provided/funded by the proponent of that development. This principle protects the prior rights of agricultural producers to practice agriculture on rural land.
5. Where conflicts already exist between agricultural and residential land uses, mechanisms including mediation, source controls and public education should be encouraged.

Objectives

1.14 The planning guidelines seek to achieve the following objectives:

1. To protect the use of reasonable and practicable farming measures that are practised in accordance with the Environmental Code of Practice for Agriculture and associated industry-specific guidelines.
2. To minimise scope for conflict by developing, where possible, a well-defined boundary between agricultural and residential areas and not interspersing agricultural and residential areas.
3. To minimise the impacts of residential development on agricultural production activities and land resources.
4. To minimise the potential for complaints about agricultural activities from residential areas.
5. To provide residents with acceptable environmental conditions in residential areas that are located adjacent to agricultural production areas.

Structure of the Planning Guidelines

1.15 The contents of these planning guidelines are as follows:

- **Section 2** provides advice on forward planning to prevent and/or minimise conflicts.
- **Section 3** details how to assess the need for buffer areas as part of development assessment and provides a performance based approach to planning scheme provisions.[1]
- **Section 4** deals with issues of use, ownership and maintenance of buffer areas.
- **Section 5** provides advice on situations where conflict may already exist.
- **Section 6** identifies roles and responsibilities.
- **Appendixes** provide information on existing controls and technical data to assist in the design of effective buffer areas.

Definitions and Abbreviations

1.16 For the purpose of these planning guidelines, the following abbreviations are used:

DLGP	-	Department of Local Government and Planning
DNR	-	Department of Natural Resources
DPI	-	Department of Primary Industries
ESD	-	Ecologically Sustainable Development
EP Act	-	*Environmental Protection Act 1994*
EPP	-	Environmental Protection Policy
$L_{Amax,T}$	-	The average maximum A-weighted sound pressure level in a specified time interval (T) or event
LG(P&E) Act	-	*Local Government (Planning and Environment) Act 1990*
SPP1/92	-	State Planning Policy 1/92: Development and the Conservation of Agricultural Land

1 The performance based approach is explained in paragraph 2.27

1.17 The following definitions have been adopted in the planning guidelines:

Agricultural land use—the use of land for the production of food, fibre and timber; including grazing, cropping, horticulture and forestry[2]. Agricultural land use is subject to constraints imposed by:

- climate
- slope, soil and water limitations
- processing requirements
- economic conditions.

Buffer area—an area of land separating adjacent land uses that is managed for the purpose of mitigating impacts of one use on another. A buffer area consists of a separation distance and one or more buffer elements.

Buffer element—a natural or artificial feature within a buffer area that mitigates an adverse impact. A buffer element may include open ground, a vegetation buffer and/or an acoustic barrier.

Building envelope—A diagram drawn on a subdivision plan, or other plan that forms part of a development application, defining the limits for the siting of buildings (and associated services and facilities e.g swimming pools).

Drift—airborne movement of agricultural chemicals onto a non-target area with the potential for risk of injury or damage to humans, plants, animals, environment or property[3].

Residential development—urban subdivision, low density residential subdivision (including rural residential) and rural allotments created primarily for residential purposes (residential excisions, concessional allotments, retirement blocks etc.), and other places used as human accommodation excluding dwellings associated with bonafide agricultural holdings.

Sensitive receptor

- a dwelling, mobile home or caravan park, residential marina or other residential place in a residential development;
- a motel, hotel, or hostel;
- a childcare centre, kindergarten, school, university or other educational institution; or
- a medical centre or hospital.

Separation distance—the total linear distance between a source and a sensitive receptor.

[2] Guidelines for the separation of residential uses from intensive agricultural production establishments including cattle feedlots, piggeries and poultry farms are available in separate publications listed in the references.

[3] The detection of odour does not necessarily correspond to the presence of an active chemical ingredient.

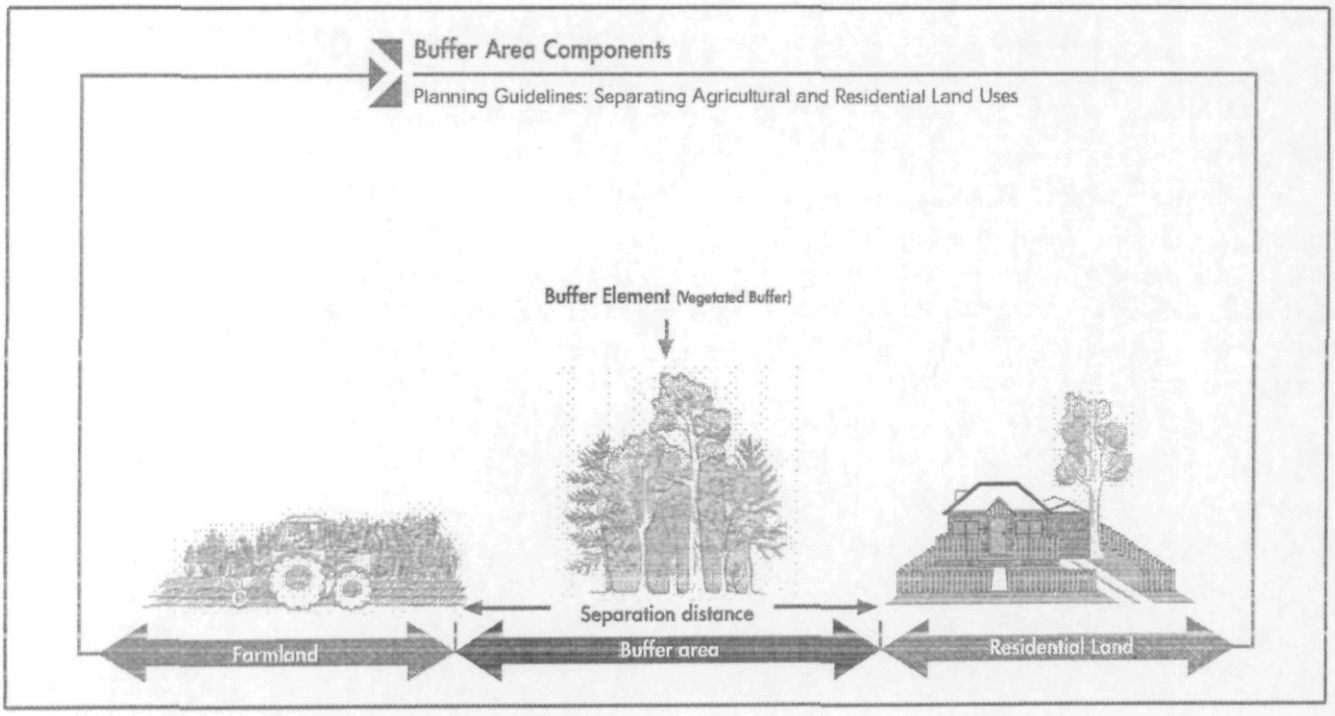

Figure 2. Buffer area components

2. PLANNING SCHEMES

2.1 Planning schemes provide local governments with the opportunity to minimise the potential for conflict between agricultural and residential land uses by separating those uses, thereby providing more certainty for land holders.

Methods of Achieving Separation

2.2 The main ways of achieving separation through planning decisions and the use of planning controls are as follows:

- As far as possible, isolate good quality agricultural land from uses likely to conflict with nearby farming activities.
- On the edges of urban areas, retain natural features (e.g. watercourses and ridge lines) free from development to act as buffer areas between newly developing areas and farmland.
- Ensure that, as far as practicable, newly developing areas are designed so that features such as public open spaces, road reserves or purpose-designed buffer areas provide the required separation.
- Require individual developments to be designed in ways that incorporate buffer areas.

2.3 Some or all of these methods will be appropriate, depending on the local circumstances. The rest of Section 2 describes how these various methods can be used when preparing planning schemes and assessing development applications.

Overview

2.4 Planning schemes comprise a forward-looking land use/development strategy complemented by development assessment provisions. These have been known respectively as the Strategic Plan and the Planning Scheme Provisions in the *Local Government (Planning & Environment) Act 1990*.

2.5 Preventing and/or minimising conflict between agricultural land uses and residential development will involve:

- determining the potential for conflict through investigations conducted as part of the preparation or review of planning schemes;
- reducing the opportunity for land use conflict by adopting appropriate planning strategies in the Planning Scheme;
- adopting provisions that are consistent with these planning guidelines and appropriate to local circumstances.

Strategic Planning

2.6 Strategic planning, supplemented as necessary by local area planning, establishes the broad framework to guide future land use and development. Therefore, when preparing or reviewing strategic plans, areas of good quality agricultural land should be identified and protected through appropriate land use designations[4] .

2.7 These designations should include additional areas considered essential for the protection of good quality agricultural land and its productive potential. Additional areas may need to include buffer areas or areas containing essential agricultural infrastructure (e.g. sugar mill tramways, irrigation pump stations, farm packing sheds and cool rooms).

2.8 Any analysis of future development options and settlement patterns should include an assessment of the potential for conflict between agricultural and other land uses. Areas designated for residential and other urban uses should be clearly delineated thereby providing some certainty about the intended boundaries between urban and rural areas. Designations should be based upon an assessment of future development needs for a reasonable time scale (approximately 15 years). This approach avoids blighting agricultural land long before it may be required for development.

Isolating Good Quality Agricultural Land from Incompatible Uses

2.9 Land use strategies in strategic plans and any supporting local area plans should, as far as practicable, aim to isolate good quality agricultural land from uses likely to conflict with certain farming activities.

2.10 Areas of poorer quality agricultural land, when used for purposes that will not cause land use conflicts, may serve to isolate more intensively farmed land from encroaching incompatible uses. Farm forestry and grazing are examples of rural land uses that are compatible with either adjoining areas of intensive agriculture or adjacent residential uses.

2.11 Where achieving isolation is not possible through forward planning, separation should be achieved in other ways.

[4] Advice on this is contained in *Planning Guidelines: The Identification of Good Quality Agricultural Land*.

Using Retained Natural Features as Buffer Areas

2.12 Boundaries of urban designations should, where practicable, take opportunities to follow natural features that will be retained undeveloped, such as watercourses, ridge lines, steeply sloping ground and areas for nature conservation *(see 4.9)*. All these features can act as natural buffer areas between farmland and urban areas.

Designing Urban Areas to Provide Buffer Areas

2.13 Certain facilities and uses, such as public open spaces, road reserves and golf courses, can also be located and designed to act as buffer areas.

2.14 Public open spaces and recreational uses should only be located at the edge of development and used as buffer areas if:

- the location is appropriate for satisfying the open space needs of the community;
- the use of the buffer area as public open space is compatible with adjoining uses,
- the impacts from the adjoining agricultural use do not preclude recreational use of the open space.

2.15 In many of the smaller towns in Queensland, a strip or a tract of Crown land is set aside as a town reserve or common that can act as a buffer area between agricultural and residential land. As well as a buffer area, such town reserves provide a 'land store' dedicated for various public purposes, including parks.

Designing Developments to Provide Buffer Areas

2.16 Despite designing land use strategies to minimise potential for conflict, there will be areas where residential and other urban uses have to locate adjacent to good quality agricultural land. Policies and measures to reduce the potential for conflict should therefore be set out in strategic plans or elsewhere in planning schemes.

2.17 Broad criteria should be included for determining the need for buffer areas and for the design of features such as vegetated buffers. In areas where potential for conflict is identified, each development application should be required to include an assessment of the need for buffer areas and design measures to ensure their effectiveness. Appropriate design requirements are described in Section 3.

2.18 Strategic plan maps can depict an 'area of investigation' where proposed residential uses adjoin existing agricultural areas *(see Figure 3)*. The size of the area of investigation should be determined by:

- the potential agricultural activities in the area concerned (see paragraph 1.13, Principle 3);
- the minimum separation distances appropriate to the likely sources of conflict *(see Table 2)*.

2.19 Planning schemes should provide scope for required separation to be achieved in different ways. A purpose-designed buffer area is one method. Alternatively, the buffer area could be incorporated into the design of the particular development.

2.20 For example, with residential development, large residential allotments incorporating the required buffer area could be located on the boundary between the residential subdivision and agricultural land. Planning schemes should allow for this approach by specifying minimum lot sizes sufficiently large to incorporate the desired buffer area into the allotment while allowing an adequate balance of the lot to be available for the house and normal residential use. To minimise any loss of development potential, a higher allotment yield could be offered over the balance of the development site to offset the use of the larger lots incorporating the buffer area.

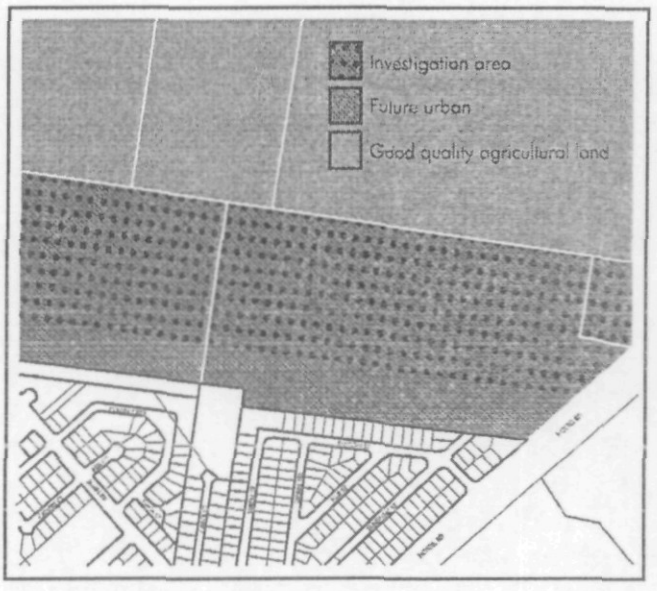

Figure 3. Strategic plan map

2.21 Designing and providing an adequate buffer as part of each residential allotment should enhance the prospect of the buffer areas being effective and well managed.

Temporary Buffers

2.22 In areas experiencing high levels of urban growth, relatively large areas of land might need to be designated for urban development. Situations will arise where good quality agricultural land is necessarily designated for development, but that development may be some years away. In such cases, consideration should be given to the need for temporary buffers at particular development stages to protect continuing farm operations until that farmland is developed.

2.23 Strategic plans or another part of the planning scheme should identify where the need for such buffer areas should be considered. Normally, the temporary buffer area should be incorporated in the future subdivision design, and planning schemes should include such a requirement. However, as the need for a buffer area is only short term, it need not be designed as a permanent feature, unless that feature has a desired role in the urban area (e.g. public open space or large residential allotments as described in 2.20).

2.24 Alternatively, land in the next development stage could still be farmed until required for development, but a buffer area incorporated into the farm management. This approach can only be required when the development approval includes the farmland concerned.

2.25 Depending on the degree of conflict and the lifespan of the buffer area, such temporary buffer areas may be considered unnecessary by council. Temporary buffer areas should be subject to the same design criteria as permanent buffer areas to ensure effectiveness at reducing conflict.

Development Assessment Provisions

2.26 Planning schemes should contain development assessment provisions to support the land use strategy and policies. Such provisions should be designed to achieve the appropriate protection of good quality agricultural land and reduce the potential for conflict between agricultural and residential land uses.

2.27 Development assessment provisions should preferably be performance based[5]. Such provisions focus on achieving specific outcomes, but allow flexibility in the means of achieving these outcomes rather than relying only on prescriptive requirements. Performance-based provisions can therefore ensure that agricultural impacts on adjoining residential and other urban uses are minimised, but allow for differing approaches and responsiveness to local circumstances. Examples of such provisions are provided in Section 3.

2.28 For local governments without a planning scheme, a policy[6] should be prepared to detail the mechanisms required when land use and subdivision approvals are being assessed in close proximity to agricultural land.

Appropriate Development

2.29 Minimising the potential for land use conflict can be achieved by limiting those uses regarded as inappropriate in areas of good quality agricultural land and immediately adjoining areas. The planning scheme should therefore aim to limit development in such areas to agricultural uses and other uses required to support agricultural activities. Such uses may include saleyards, grain drying facilities, animal husbandry services, storage for fresh produce, custom machinery operators.

2.30 In buffer areas between farmland and urban development, the planning scheme should aim to limit development to uses that do not detract from the effective operation of the buffer area. Such uses should therefore be compatible with the adjoining agricultural areas and adjacent residential development.

2.31 Examples of compatible uses (depending on the agricultural uses) include farm forestry, plant nurseries, horse trails, walking/cycling tracks, sport fields or other recreational activities. However, if the buffer area is created primarily to reduce conflict from agricultural chemical spray drift, some of these uses may not be compatible. In certain cases of land use conflict, it may be appropriate that minor loss of amenity is tolerated if the intrusion occurs on an infrequent basis without associated health risks.

2.32 In urban areas, the close proximity of any agricultural land should be a major consideration when deciding upon the type and design of development, including the need for buffer areas.

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[5] Such an approach involves clearly stated objectives and offers a choice of following prescribed development standards ('acceptable solutions'), or varying those standards in accordance with the objectives and performance criteria:
Objectives: describe the preferred outcomes for development and provide the opportunity for a variety of innovative solutions
Performance Criteria: the means of achieving the objectives—what is to be achieved rather than how this should be done
Acceptable solutions: set out some ways that guarantee the objectives can be met to the desired standards.

[6] Local planning policies under the *Local Government (Planning & Environment) Act 1990* or planning scheme policies under the Integrated Planning Act.

Subdivision of Land

2.33 SPP 1/92 requires local government to give due consideration to the protection of good quality agricultural land when assessing applications for subdivision.

Residential or Rural Residential Areas

2.34 Where residential areas have to abut farmland, adequate separation can be achieved through subdivision design *(see 2.20 and 2.21)*.

2.35 If the required buffer area is incorporated in large residential allotments, the buffer portion of the lot should be suitably designed and protected through conditions of development approval. These include requiring the provision and maintenance of planted areas in the buffer area, defining building envelopes for the location of houses outside the buffer area, or applying vegetation protection controls. The larger residential lots could be designed in such a manner as to allow redevelopment should the buffer area become redundant.

2.36 If buffer areas are proposed as one component of the public open space contribution, the issues set out in 2.14 above should be considered.

2.37 The ownership and maintenance of buffer areas are discussed in Section 4.

Single Residential Allotments

2.38 The creation of residential allotments in productive rural areas often fragments farmland and may lead to land use conflict, particularly when the occupants of the new dwelling have no direct connection with the surrounding agricultural activities. Where possible therefore, single residential allotments (such as 'concessional lots' or 'family excisions') should not be located on or adjacent to good quality agricultural land.

2.39 Local governments are encouraged to review and amend any subdivision provisions that permit residential allotments in rural areas to ensure that appropriate buffer areas are required adjacent to good quality agricultural land.

Conditions of Approval

2.40 Conditions should be set by local governments according to the relevant requirements of the planning legislation to ensure that on going maintenance and effectiveness of the buffer areas are binding upon successors in title.

3. Conflict assessment and buffer area design

3.1 Adequate consideration of possible conflict is necessary during development assessment. Development proponents should be required to assess the potential for land use conflict in areas of investigation *(see 2.13)*, or in proximity to good quality agricultural land. This should be done regardless of whether or not the good quality agricultural land is being utilised for agriculture at the time of an application.

3.2 Councils may require reports from suitably qualified consultants to address each element of conflict and accompany an application where:

- the proposed development is within the area of investigation; or
- the planning scheme has not resolved or is silent on the issue of land use conflict; or
- the proposed development is contrary to the planning scheme.

3.3 In investigating the need for appropriate buffer areas, the following steps should be taken:

- Determine the sustainable agricultural land use with the potential of causing most problems for adjacent residential uses and which is reasonably likely to occur on the subject land.
- Identify the elements that may cause conflict and the extent of the conflict. The elements should be quantified, where possible, in terms of frequency and duration of activities to determine the element's impacts.
- Explain how the proponent intends to address each element to achieve acceptable outcomes in terms of residential area design, size of lots, separation widths, tree planting, acoustic barriers etc.
- Propose the means by which the proposed measures will be monitored and maintained. This should include responsibility for implementing and maintaining specific features of the buffer areas to ensure continued effectiveness.

3.4 When assessing development applications, local governments will need to consider the information submitted, and ensure that the mechanisms proposed to ameliorate land use conflict address all elements. The mechanisms must be flexible enough to accommodate possible changes in agricultural practices on the adjacent land and be able to be implemented through the planning approval process. DNR is available to assist local governments in determining likely agricultural land uses.

3.5 The following provisions are provided for guidance in development assessment and for adoption by local government. Solutions other than those described may be acceptable to councils to meet the performance criteria.

Element: Agricultural chemical spray drift

Overview

3.6 The off-target movement of agricultural chemicals can be a cause for concern to residents in proximity to farming areas. These concerns are largely based on fears of exposure to agricultural chemicals but also due to detection of odours associated with the chemical *(see Appendix 5)*. It should be noted that the guidelines treat chemical spray drift and odour as separate elements for the design of buffer areas *(see section 3.15–3.20)*.

3.7 A Federal Government working group has conducted a review of agricultural chemical spray drift (CSIRO 1993). It concluded that 'there is insufficient knowledge to settle on a single distance for a buffer zone and that evidence indicates that buffer zones need to be chemical/formulation specific, based on supporting data.'

Available information

3.8 Studies at Emerald in 1990–91 concluded that the estimated average seasonal exposure for an adult or child of the five aerially applied insecticides detected did not exceed 0.2% of the World Health Organisation Acceptable Daily Intake. These studies did not measure the distance of measurement points from agricultural areas, but generally were in excess of 300 m from areas of chemical applications. However the perception of risk in the community associated with chemical spray drift persists.

3.9 Research and subsequent modelling has indicated negligible chemical drift at a range 300 m downwind from the release point of a chemical spray application (Spillman 1988). This research suggests a 300 m separation distance downwind of agricultural spraying is an acceptable minimum distance for adoption. It should be noted that the perception of 'negligible drift' may be influenced by the toxicity of the chemicals involved and may pose an unacceptable risk to some members of the community.

Other research and field trials have shown vegetated buffers are effective in capturing up to 80% of pesticide spray drift from an application upwind of a single row of trees (Harden 1992). Several Queensland councils now require vegetated buffers as a condition of development approval at the interface between agricultural and residential land use. Specific design criteria for vegetated buffer elements are presented in Appendix 2. Revegetation or thinning of existing stands of vegetation to the specifications in Appendix 2 may also be appropriate.

Buffer Area Width

3.10 From a planning perspective, it is not considered practical to base buffer area dimensions on individual chemicals or formulations. Based on the available research on chemical spray drift, the planning guidelines have adopted a minimum width of 300 m where open ground conditions apply; and a minimum width of 40 m where a vegetated buffer element can be satisfactorily implemented and maintained. These dimensions may vary according to local topographical or climatic conditions or as further knowledge is obtained.

3.11 Farm management can influence the effectiveness of buffer areas. The advice provided in the planning guidelines in relation to agricultural chemical use assumes farmers and their employees and contractors carry out their activities in accordance with reasonable and practicable measures as set out in the Environmental Code of Practice for Agriculture, and the *Agricultural Chemicals Distribution and Control Act 1966*. The Advisory Standard For the Storage and Use of Chemicals at Rural Workplaces provides additional guidance to persons with obligations under the *Workplace Health and Safety Act 1995*. It should be noted that currently there is no acceptable ambient air standard for agricultural chemical spray drift.

3.12 It should be noted that the recommended vegetated buffer (which includes multiple rows of trees) will not capture 100% of the chemical spray drift, but may reduce spray drift to less than 1% at a sensitive receptor when managed in terms of porosity, litter build up and noxious weed control to ensure effectiveness.

3.13 Factors affecting buffer area requirements for reducing agricultural chemical spray drift include:

- chemical composition/formulation e.g. toxicity, evaporation rates;
- method of application/release height e.g. aerial application, airblast mister etc.;
- spray technology e.g. nozzle type, droplet size;
- frequency of application;
- ability of the vegetation to capture spray droplets;
- target structure;
- weather conditions e.g. wind speed and direction, air turbulence, inversions;
- microclimate;
- geographical conditions and barriers e.g. topography.

3.14 Further information and advice on the use and effects of agricultural chemicals is available from:

Department of Primary Industries Agricultural Standards Ph: 07 3239 3936

Department of Training and Industrial Relations Division of Workplace Health and Safety (Rural Officers) Ph: 1800 177 717

Queensland Farmers Federation (Workplace Health and Safety Officers) Ph: 1800 818 006

Department of Environment district or regional offices

Element: Agricultural Chemical Spray Drift

Objective: To locate new residential areas so that the impact of agricultural chemical spray drift on amenity and health is avoided and complaints from residents regarding the use of agricultural chemicals is unlikely.

Performance Criteria	*Acceptable Solutions*
Residential development to be located or incorporate measures such that chemical spray drift does not adversely affect community public health and safety.	(i) The separation distance between a sensitive receptor and agricultural land is a minimum of 300 m. or: (ii) A vegetated buffer designed by a consultant acceptable to council and incorporating the criteria shown in Appendix 2 is located between the sensitive receptor and adjacent agricultural land. The vegetated buffer should: • be provided with a suitable watering system; • include access strips on either side which are kept clear of vegetation and other flammable materials; • be of a height, density and width (40 m min) acceptable to council prior to the development of residential areas within 300 m of the agricultural land. or (iii) Other measures which meet the performance criteria and which are acceptable to council.

Element: Odour

Overview

3.15 Odour in rural areas can arise from use of agricultural chemical sprays, fertilisers (inorganic and organic), effluent disposal and intensive livestock (e.g. feedlots, piggeries and poultry farms) and composting plants. Such detrimental odours can impact on residential amenity and have the potential to affect public health.

3.16 Odour is often a major factor in many complaints about off-site chemical spray drift where there is sometimes no objective evidence of toxic exposure. Some agricultural chemicals contain 'markers' (strong odours) to allow easy identification and these markers or mixing agents are sometimes detected at a distance from the target area and cause concern even though in some circumstances extremely low levels of the active ingredients may be present. Residents' association of the odour with the chemical is sufficient to raise fears of exposure *(see Appendix 5)*.

3.17 Factors affecting complaints from odour are influenced by the frequency, intensity, duration and offensiveness of the odour. An objectionable odour may be tolerated if it occurs infrequently at a high intensity, however a similar odour may not be tolerated at lower levels if it persists for a longer duration.

Available information

3.18 Odour can be emitted from a variety of sources and dispersed by the atmosphere. Ground level concentrations of odour have been reported as being inversely related to wind speed and atmospheric conditions, i.e. the lower the wind speed and the more stable the conditions, the higher the concentration. The subjective nature of conflict resulting from exposure to odour makes the determination of design goals difficult (Holmes et al. 1996).

3.19 Industry-specific guidelines have been developed to determine suitable separation distances to deal with odour for feedlots, piggeries and poultry farms. Factors influencing the separation distance required include the number of livestock, site factors and levels of management. The siting of such industry and other development should be carefully considered in areas with poor dispersion conditions e.g. valleys. The buffer area between a proposed residential development and existing or approved intensive livestock facilities or composting facilities should conform with standards specified in the relevant industry specific guidelines. The separation distance will be determined by consideration of the licence conditions applying to individual facilities set by DPI, DoE and/or local government.

3.20 While detection of odours may be instantaneous, often several hours are needed to confirm the presence and source of such odours. Odours from intermittent sources, such as chemical applications in rural areas, may only reach nuisance levels when exposure at a sensitive receptor exceeds a duration threshold. This is supported by research conducted by Holmes et al. (1996) who nominate 1% of time as an appropriate threshold.

Odour Duration Threshold

3.21 For the purpose of the planning guidelines and the design of effective buffer areas, the following odour duration threshold has been adopted:

- Odour from intermittent agricultural activities (e.g. fertiliser spreading, effluent disposal or chemical spraying) should not exceed nuisance levels outside any affected sensitive receptor for greater than 1% of the time (or 88 hrs/yr).

3.22 The duration threshold allows for some detectable odour levels provided they occur for less than 88 hrs/year. For the purposes of the planning guidelines, the following formula can be used to determine the potential time of odour impact upon a sensitive receptor:

$t = n \times o$

where:

t = potential hours of nuisance level odour per year

n = number of cropped hectares within 500 m of the receptor (40 ha max)

o = hours of operation per hectare per year of odour producing activity (a....z) (see tables in Appendix 4)

If the time 't' is greater than 88 hrs/year then the design goal has been exceeded and a buffer area may be required.

Buffer Area Width

3.23 Information on odours from poultry farms (DoE, 1994) indicate that 500 m would be an acceptable separation distance for odour mitigation should the duration threshold be exceeded.

3.24 Applicants who wish to propose alternative odour reduction measures should consider the following factors that influence odour dispersion:

- atmospheric stability wind speed and direction;
- terrain/topography and drainage flows;
- vegetation density;
- impact location;
- odour source, e.g. composting, chemical formulation, effluent disposal etc.

3.25 Information on odours associated with some agricultural chemicals is provided in Appendix 5. Additional advice should be sought from agricultural chemical suppliers, AVCARE and other sources to determine the nature and odours likely to be encountered in particular instances.

Element: Odour from agricultural activities

Objective: To locate new residential areas so that the impact of odour generated by agricultural activities on residential areas is minimised.

Performance Criteria	*Acceptable Solutions*
Residential development to be located or incorporate measures to minimise the impact of odour in excess of the duration threshold generated by intermittent agricultural activities at dwellings within the development.	(i) The separation distance between a sensitive receptor and agricultural land is a minimum of 500 m. or: (ii) A buffer area design based on a report consistent with the draft EPP (Air) from a qualified consultant acceptable to council detailing relevant factors and verifying that odour design goals in the EPP (Air) will be met at sensitive receptors within the development. or: (iii) Other measures which meet the performance criteria and which are acceptable to council.

Element: Noise

Overview

3.26 There are four types of noise associated with agricultural activity which may lead to land use conflict. These are the noises associated with intensive livestock facilities, aircraft activities, constant or long-term noise, (e.g. pumps or refrigeration plants), and intermittent noise from tractors and other machinery.

3.27 The draft EPP (Noise) and associated guidelines allows agricultural practices to generate noise provided the activity is in accordance with reasonable and practicable industry measures as described in the Environmental Code of Practice for Agriculture and other industry specific guidelines. Under the code, it is not a breach of the general environmental duty of care if noise is generated in circumstances where it can be shown that the activity is not frequent or that there are no practicable alternatives.

3.28 The Code of Practice and other industry specific guidelines, further advises that rural industry practices should seek to avoid causing excessive noise at night-time (10 p.m.–6 a.m.) which may affect residential areas. Modification of farm machinery and management practices may reduce noise levels, but there will be instances when the generation of noise due to agricultural practices is unavoidable and may result in conflicts between land uses. Planning may also reduce conflict arising from noise by requiring appropriate buffer areas.

3.29 Many noisy activities associated with agriculture are intermittent and may only affect a particular adjacent residence for a few hours several times a year. For example, small cropping on a two crop per year basis for potatoes generally requires approximately 25 hours of machinery activity per hectare per year; sugar cane production requires less than 5 hours machinery activity per hectare per year.

Noise Level and Duration Thresholds

3.30 For the purpose of the planning guidelines the following noise levels and cumulative time thresholds have been adopted to determine whether noise is likely to be excessive outside a noise-sensitive receptor. The noise source is classed as intermittent if the specified noise level in the following table is exceeded for a cumulative total of 10 hours per year. If this cumulative time threshold is not exceeded, the noise source is considered not sufficient to require a buffer area. The noise source is classed as long term if the specified noise level in the following table is exceeded for a cumulative total of 50 hours per year. Furthermore, stricter design goals are applied to night time operations between 10 p.m. and 6 a.m.

Table 1. Noise design goals

	Intermittent >10 hrs/yr	Long term >50 hrs/yr
Day-time 6 a.m.–10 p.m.	75 dB(A) ($L_{Amax,T}$)	60 dB(A) ($L_{Amax,T}$)
Night-time 10 p.m.–6 a.m.	55 dB(A) ($L_{Amax,T}$)	45 dB(A) ($L_{Amax,T}$)

3.31 The following formulae outline the steps for calculating cumulative hours of noise which exceed the design goals per year from agricultural activities.
The formula for deriving hours per year of excessive noise from intermittent day-time activities is as follows:

$$x = \sum\{(c \times f \times h) \times (\pi \times d^2/2)\}$$

where:

x = hours/year when noise exceeds 75 dB(A) ($L_{Amax,T}$)[7]

c = crops per year

f = frequency of activity (a...z) per crop

h = hours of noise per hectare for activity (a....z)

$d = 10^{\{(N-60.47)/16.6\}}$ where

N = noise measured as $L_{Amax,T}$ at 7.5 m for activity (a....z)

NB: For long-term day-time activity, use

$d = 10^{\{(N-45.47)/16.6\}}$

The formula for deriving hours per year of excessive noise from intermittent night-time activities is as follows:

$$y = \sum (c \times f \times n)$$

where:

y = hours/yr when noise exceeds 55 dB (A) ($L_{Amax,T}$)[7]

c = crops per year

f = frequency of night-time activity (a...z) per crop

n = hours of activity per night (prior to 6am) when noise levels exceed 55dB(A) ($L_{Amax,T}$)

[7] $L_{Amax,T}$ is the average maximum A-weighted sound pressure level in a specified time interval or event.