The Queensland Water Directorate

Sewerage Infrastructure Buffer Zones (existing): Information for Service Providers
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1. Purpose

The following guidelines have been developed to assist sewerage service provider employees with responding to requests from planning authorities regarding development of land near or within sewerage infrastructure buffer zones. The intention is to prevent development encroaching inappropriately into sewerage infrastructure buffer zones and promote the provision of appropriate buffer zones around such infrastructure in order to minimise the impact of odour, noise, and hazards on nearby residents and ensure that the infrastructure is protected for future growth. Where encroachment is sometimes inevitable, the intent is to ensure that the real costs of plant upgrades are appropriately considered in making that planning determination.

This guideline specifically relates to existing infrastructure such as Sewage Treatment Plants and development around those plants, not proposals for development of new plants. New sewerage infrastructure is subject to additional approval processes, e.g. those relevant to Environmentally Relevant Activity (ERA 63).

The buffer zone requirement for sewerage infrastructure will be influenced by a number of factors including the nature and size of the plant, the topography, micro climate and the sensitivity of neighbouring land uses. Although this guideline provides a general framework for decision making and working with planning authorities, a standard solution will not always be possible for all infrastructure.

2. Summary of Land Use Planning in Queensland

2.1 Legislation

Planning and development activities in Queensland are (as of July-2017) undertaken in accordance with the Planning Act 2016, the Planning and Environment Court Act 2016 and the Planning (Consequential) and Other Legislation Act 2016. The Acts set high level requirements for planning and development in Queensland. The Planning Act 2016 provides for the making of documents which guide all strategic planning and development throughout the state.

The Planning Regulations set out the triggers and thresholds for when development applications are referred to the state government for assessment. The regulation includes:

- requirements and process matters, such as the process for Ministerial call ins, and the assessment matters applying generally to all development applications
- mandatory matters, such as zone names, purpose statements, and definitions
- the prescribed amount for infrastructure charges
- the state's development assessment schedules prescribing assessable development; assessment benchmarks and other assessment matters; assessment managers; referral agencies; and fees for development applications
- requirements for public access to planning documents and information.

(DILGP, 2016a)
The *Queensland State Planning Policy (SPP)* articulates the state's interests in planning and development and provides direction to local government about how the state's interest should be taken into account in local plan making and development assessment.

The SPP outlines the state interest in regards to emissions and hazardous activities which includes, for example, protecting approved land uses or areas (such as sewage treatment plants) “from encroachment by development that would compromise the ability of the land use to function safely and effectively” (p.49). There is an SPP guideline for each state interest, which is provided to assist local government to implement part E (state interest policies) of the SPP.

### 2.2 Local Government Planning Scheme

In accordance with the requirements of the Acts in addition to the *Planning Regulations* and *Queensland State Planning Policy* each Local Government area develops and maintains Local Government Planning instruments. The Local Government Planning scheme is the key instrument that outlines development across the local government area. The Local Government must ensure that the needs of the state and the regional community are incorporated in the Planning scheme and must also consider all the state interests and any regional plan that applies in their areas. In the planning scheme, the local government uses the terms and categories of development set up in the Planning Act and establishes how these different types of development will be assessed under the planning scheme.

New applications for development (if required under the Act) will need to go through an assessment and approval process, generally through the local government planning authority. The local government planning authority will then review the application in line with the current Local Government Planning Scheme. A local government must assess each ‘properly made’ application it receives in accordance with provisions (the 'decision rules') in the Planning Act. The local government must comply with the regulations and cannot prohibit a type of development in its planning scheme unless the regulations permit it.

Refer to Appendix A for a list of relevant planning legislation.

### 2.3 Dispute Resolution

The Planning and Environment Court and the Development Tribunal provide a dispute resolution avenue which local government, applicants and community members can access, as specified under the legislation. Each party bears their own costs, except in limited circumstances to do with frivolous, vexatious or improper action (DLGP, 2016b).

### 3. Guidelines for Buffer Zones around sewerage infrastructure

While using a number of techniques to avoid and minimise the creation of odours at sewerage infrastructure must proceed any reliance on a buffer zone, the use of buffer zones for avoiding unexpected odour issues and protecting the community in unforeseen events is still an essential risk management factor for sewerage infrastructure.
The Queensland Department of Environment and Heritage Protection (EHP) has released a *Guideline for Odour Impact Assessment from Developments*. The Guideline promotes the use of proper land use planning to avoid incompatible land uses in close proximity to odour causing industries. For the purposes of the guideline, EHP adopts the current Victorian EPA approach on buffer distances (i.e. that they are provided as a risk management tool to manage unexpected, non-routine or accidental emissions) and the *Victorian EPA’s Recommended Buffer Distances for Residual Air Emissions, Publication No. AQ 2/86* is to be adopted as the interim guideline on buffer distances. The current Victorian EPA recommended buffer distance for STP buffer distances is provided in Table 1 below.

**Table 1: Vic EPA Separation distances for sewage treatment plants (in metres)**

<table>
<thead>
<tr>
<th>Type of Installation</th>
<th>Separation Distance (N=equivalent population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical/biological wastewater plants</td>
<td>$=10n^{1/3}$</td>
</tr>
<tr>
<td>Aerobic pondage system</td>
<td>$= 5n^{1/2}$</td>
</tr>
<tr>
<td>Facultative ponds</td>
<td>$= 10n^{1/2}$</td>
</tr>
<tr>
<td>Disposal areas for secondary treated effluent by spray irrigation</td>
<td>200m</td>
</tr>
<tr>
<td>Disposal areas for secondary treated effluent by flood irrigation</td>
<td>50m</td>
</tr>
</tbody>
</table>

Although the above buffer zone guidelines are generally accepted as industry best practice, in reality, there may be considerable pressure from planning authorities and developers to allow some development within an established buffer zone. While reductions of the buffer zone could be considered, appropriate modelling, odour investigations and risk analysis should first be carried out.

The *Victorian EPA’s Recommended Buffer Distances for Residual Air Emissions, Publication No. AQ 2/86* (2013, p.14) states that the following criteria should be satisfied before detailed consideration is given to site-specific variation of the guideline distances provided:

- (a) The plant has a standard of emission control technology significantly greater than the good level of control assumed in the preparation of this document. Best Available Technology would normally be necessary.
- (b) An environmental audit of residual emissions has been completed.
- (c) There is no history of complaints arising from residual emissions (in the case of an existing plant).
- (d) The plant is significantly larger or smaller than those on which the recommended distance is based, to an extent which will substantially affect residual emissions performance.
(e) There are exceptional topographic or meteorological characteristics which will affect dispersion of residual air emissions.

Before considering any encroaching development applications including changes to existing buffer zones, planning authorities should be encouraged to consider whether the guideline criteria set out above have been met. Relevant service provider staff will therefore need to ensure that the details relating to the above information have been provided.

4. General Guidelines for responding to planning requests

Service providers can expect to continue to receive requests from Council planning authorities and developers to rezone land for residential/incompatible purposes in the buffer zone areas around existing sewerage infrastructure. It is therefore crucial to ensure that planners are aware of how incompatible development can impact the viability of sewerage infrastructure unless buffer zones are identified and enforced. The rezoning of land surrounding sewerage infrastructure to ‘residential’ is the most common issue.

In the event of a development application or rezoning proposal services providers should ensure that they have the information needed to develop a business case to feed into the process of planning scheme changes, clearly explaining;

- Scenarios and impacts, including costed options to mitigate impacts – e.g. buying land etc.
- Evidence of similar experiences/ other case studies including associated costs (qldwater has published case studies for this purpose – see Appendix A of ‘Sewerage Infrastructure Buffer Zone - Info sheet for planners’).

4.1 Key issues with encroachment on sewerage infrastructure buffer zones

Service providers should discuss the key issues with encroachment on buffer zones with planning authorities. The qldwater Sewerage Infrastructure Buffer Zones – Information sheet for Planners has been developed to inform this process and includes information on the;

- Environmental obligations and licence requirements of STPs.
- Obligation to provide services to the community/capacity for future upgrades.
- Potential cost of mitigating any odour issues due to encroachment.

4.3 Provision of Buffer Zones in Planning Instruments

Service Providers should work with their local government to ensure that designated buffer areas for sewerage infrastructure are created through relevant Local Government Planning Schemes, before they are finalised. Local governments are required to review their planning scheme every 10 years.

It is also important to ensure that service provider staff are aware of the contents of the current planning scheme in relation to sewerage infrastructure (e.g. how the sewerage infrastructure and associated buffer is zoned as well as how other surrounding areas are zoned) and any impacts of encroachment on the infrastructure if the planning scheme changes (e.g. if areas are rezoned to residential).
4.3.1 Planning Zones and definitions

Planning codes and definitions for Local Planning Schemes are contained within the Planning Regulations 2017. To assist in proper land use planning in relation to sensitive receptors, service providers should encourage planners to ensure that all relevant STPs (and associated buffers) are coded “Special purpose Zone”. As per Schedule 2 of the Planning Regulations 2017, the purpose of this code is to “a) provide for public facilities publicly or privately owned and operated and b) ensure that incompatible uses do not encroach on the public facilities and infrastructure” (p. 57). Ensuring that sewerage infrastructure is coded appropriately in the Local Government Planning scheme should assist in making it more difficult to approve incompatible uses, in particular sensitive use, within the zone.

4.2 Individual modelling (e.g. odour models)

If the sewerage infrastructure and buffer zone is in proximity to a development proposal, it would generally be the responsibility of the proponent of the encroaching development to request a variation to the existing buffer zone, and to undertake any investigations necessary to support its assessment of the impacts of the development on the infrastructure operations. These investigations could include studies on odour, noise, risk analysis and visual impact.

Modelling is however an imprecise science. Modelling can be misused in designing installations, and service providers report that it is commonly a point of contention when developers engage consultants whose modelling produces a contrary outcome to the service providers to ultimately lead to buffer reduction. There are one-dimensional and three-dimensional models with different associated costs, and the latter is considered more appropriate in dealing with a range of scenarios including low wind velocities with temperature inversions.

The potential issues with odour modelling and any discrepancies that arise should be discussed with planning authorities. Where possible, planning authorities should be encouraged to rely on the modelling provided by the service provider, whose interests are managing the infrastructure efficiently to minimise hazards and costs to the broader community. Existing sewerage infrastructure modelling (from the initial development) may already exist but may need to be updated to be relevant to current conditions.

4.4 Compatible/Incompatible Buffer Zone Land Uses

When commenting on draft planning instruments, rezoning and development proposals, the service provider should recommend compatible development within the buffer zone area while encouraging planning officials to avoid residential and most commercial development within the buffer zone.

Compatible buffer land uses are generally those land uses which do not warrant a high level of protection from any residual air emissions or other adverse impacts from the sewerage infrastructure for example, open space, recreation areas, public roads, drainable basins, natural bush/forest, constructed wetlands, flora and fauna reserves, certain industries, and agricultural use.
Other land uses may be considered compatible in certain circumstances and individual cases will need to be assessed on their merits. This should specifically take into account site specific considerations.

Some consideration might also be given to the likelihood of a plant being decommissioned in the future, which would enable development to occur within the buffer zone as a long term option.

4.5 Provision of Information for Land Owners/developers

Relevant service provider staff should request that planning staff make end purchasers, potential developers and owners aware of potential odour problems which might occur as a result of their proximity to sewerage infrastructure. This advice should be given at the planning stage (rezoning and subdivision) and/or when land within a buffer zone is sold to a new owner.

Whilst such a strategy would ensure prospective purchasers were not taken by surprise, it would not be a substitute for having appropriate buffer zone requirements and it would not absolve any responsibility under the Environmental Protection Act including requirements of the STP environmental authority. For example, there have been instances in which a developer has offered a Deed of Covenant indemnifying the council from odour complaints by occupants. However, this approach does not preclude the risk of complaints from visitors, and does not bind future owners not negate the service provider’s responsibilities under the Act.

4.6 Possible Purchase of Buffer Zone Land

The service provider does not always own the existing buffer land around its sewerage infrastructure. The service provider is therefore often unable to directly control land uses and restrict further development within buffer zones. In cases where it is considered critical to minimise the odour complaints at a particular plant (and likely that complaints will occur) which is likely to be operational for the long term, the service provider may consider purchasing buffer land around that plant. The service provider may be able to use purchased buffer land for part of its effluent or solids disposal strategies.

If it is not cost-effective to acquire buffer zone land as a means of managing odour impacts, then the costs and benefits of alternative measures for control of noise and odour emissions will need to be considered on a case by case basis, and outlined clearly to planning authorities.
References


Appendix A. Relevant Queensland Planning Legislation

The *Planning Act*

The *Planning and Environment Court Act*

The *Planning (Consequential) and Other Legislation Act*.

*State Planning Policy*

P. 49 of the *State Planning Policy* outlines the state interest in regards to emissions and hazardous activities and states the following:

Community health and safety, sensitive land uses and the natural environment are protected from potential adverse impacts of emissions and hazardous activities, while ensuring the long-term viability of industrial development, and sport and recreation activities.

Protection from emissions and hazardous activities:

(1) Industrial development, major gas, waste and sewerage infrastructure, and sport and recreation activities are located, designed and managed to avoid or mitigate adverse impacts of emissions on sensitive land uses and the natural environment.

Protection of industrial development, major infrastructure, and sport and recreation facilities from encroachment:

(5) Protect the following existing and approved land uses or areas from encroachment by development that would compromise the ability of the land use to function safely and effectively:

(a) Medium-impact, high-impact and special industries. (b) Extractive industries. (c) Hazardous chemical facilities. (d) Explosives facilities and explosives reserves. (e) High pressure gas pipelines. (f) Waste management facilities. (g) Sewage treatment plants. (h) Industrial land in a state development area, or an enterprise opportunity area or employment opportunity area identified in a regional plan. (i) Major sport, recreation and entertainment facilities. (j) Shooting facilities. (k) Motor sport facilities.

Mitigation of adverse impacts from emissions and hazardous activities:

(6) Development that is incompatible with the existing and approved land uses or areas included in policy 5 above, is located to avoid adverse impacts of environmental emissions, or health and safety risks, and where the impacts cannot be practicably avoided, development is designed to minimise the impacts.

*Local Government Planning Scheme*

Local government planning schemes describe a council’s plan for the future direction of a particular local government area and can span 20 years or more. Local Government Planning Schemes will incorporate relevant state legislation including requirements of the State Planning Policies in accordance with the Qld planning provisions.
Appendix B. Relevant Queensland Environmental Legislation

The *Environmental Protection Act 1994* is and the *Environmental Protection Regulation 2008* establish a list of industrial activities (called environmentally-relevant activities—ERAs) that must have a current development approval or environmental authority (including Sewage Treatment Plants).

The legislation also creates a general duty for all people, companies and government bodies to take all reasonable and practicable steps to avoid harm to the environment.

*Environmental Protection (Air) Policy 2008*

- Establishes long-term objectives for sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, particles, lead and a number of air toxics.
- Includes specific air quality objectives for hydrogen sulfide, an odorous gas often emitted from STPs
- Includes the qualities of the air environment that are conducive to human health and wellbeing.

*Waste Reduction and Recycling Act 2011*

- Contains a suite of measures to reduce waste generation and landfill disposal and encourage recycling. Includes information on emission controls etc.

*DEHP Guideline Odour Impact Assessment from Developments*

The purpose of this document is to provide information on odour impact assessment from developments under the *Environmental Protection Act 1994*. The Guideline recommends use of the Victorian EPA Buffer Zone Guidelines.

*Model operating conditions ERA 63—Sewage Treatment*

Provides advice to potential environmental authority holders on the model operating conditions that will be applied to their environmental authority.