CONSISTENCY FOR ON-SITE EFFLUENT MANAGEMENT IN DIFFERENT LOCAL GOVERNMENT AREAS

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Abstract

Consultants in the field of on-site effluent management typically work in a variety of Local Government Areas (LGA) and are obliged to have a perspective of the overall picture and an ability to adapt to specific requirements at different localities.

The main documents controlling on-site effluent management are the 'Silver Book' (DLG, 1998), AS/NZS 1547:2000 (Standards Australia and Standards New Zealand, 2000) and where applicable State Environmental Planning Policy No. 58 (SEPP 58, Department of Urban Affairs and Planning, 1999). Whilst being guided by these documents, experience indicates that certain requirements hold precedence over others and their interpretation varies across LGA.

Is consistency between the documents imperative? Is consistency achievable? What level of consistency is sought? Such questions are raised and considered by both consultants and consent authorities.

Variations in the approach adopted in different LGA are a function of specific environmental considerations relating to surface and groundwater quality as well as climate, soil type, slope, vegetation, the nature of development, Lot size and density of development. These variations are also blended with particular requirements of landholders regarding the type of effluent management system.

This Paper presents examples to illustrate the approach to on-site effluent management in different LGA since the inception of the three documents cited above. It is seen that consistency is only achieved on a superficial basis. But does this represent a flaw in the 'system' and should it be viewed as a problem that needs to be addressed by the industry as a whole?

Keywords

consistency, guidelines, interpretation, standards.

1 Introduction

Consistency can be defined as an agreement between things, acts or statements where there is a logical connection and also agreement with previous acts, statements or decisions. It is human nature that a degree of consistency is needed in our everyday lives in order to function properly. The main documents controlling on-site effluent management are the Silver Book (1998), AS/NZS 1547 (2000), and where applicable, SEPP 58 (1999) as administered by the Sydney Catchment Authority (SCA). After at least a few years of being in place, have the guidelines led to a desired level of consistency in relation to environmental guidelines, controls and aims?

What does consistency mean in our industry? Is it the ability to apply relevant guidelines on different sites within a given Local Government Area in an equal manner over time? Is it the ability to have a level playing field regarding the requirements for effluent management in different LGA? Would consistency allow for quick and easy approval to be gained from consent authorities? Would consistency allow for a compatible approach for consultants and consent authorities in recognising and dealing with environmental constraints?

Alternately, what does it mean to be inconsistent? Is this evidenced by variations in the interpretation of the guidelines within a given LGA? Or by the variations in the approach adopted to effluent management in different LGA? Is it a function of the different types of environmental constraints encountered and the relative importance placed on them by the consent authorities? Is inconsistency demonstrated by straying from the recognised industry guidelines in a given locality? Inconsistencies with the application of the guidelines may indicate that either an ad-hoc approach is being applied to effluent management or conversely, there is a level of over-regulation in certain areas.

As a consultant in the field of on-site effluent management, consistency is something not often encountered. In response to the variations in physical conditions and environmental issues, the requirements for effluent management and interpretation of the guidelines can change markedly even between adjoining LGA. Such inconsistencies are often unavoidable, but they can add an undesired element to approvals. There is a need to be flexible in the approach to unsewered development and the requirements of consent authorities and the local knowledge gained from experience in a given Council area is therefore invaluable.

2 Physical Characteristics

There is a variety of physical characteristics that relate to the design of a given effluent management system. These include the topography, climate, soil types, native vegetation, groundwater regimes and the proximity to watercourses and/or water bodies. Watercourses can be intermittent or perennial and water bodies can include such things as farms dams, lakes, lagoons, coastal inlets and waterways such as Pittwater for example. Heightened environmental controls are also typically provided in relation to 'prescribed' watercourses and drinking water catchments.

Whilst particular physical characteristics such as the grade of the land and proximity to watercourses may take precedence over others when being assessed by consent authorities, the final design of an effective effluent management system is normally based the combination of all factors. The three documents pertaining to effluent management consider details regarding physical characteristics and the relationship to system selection/design and the location of land application areas.

3 Type of Effluent Management Systems Utilised

To gauge existing levels of consistency, Table 1 below lists the types of effluent management system that have gained approval in a variety of LGA since inception of the three guidelines. Results are based on the author's experience and 408 sites are referred to in 19 LGA. To assist with assessing trends, the LGA have been placed into five groups based on their relative localities.

4 Approaches Adopted to On-Site Effluent Management

The following examples indicate the typical approach adopted to effluent management in a variety of LGA. They are provided to demonstrate the level of consistency that has been experienced by the author, and may vary from other consultants.

GROUP 1

Blue Mountains City Council (BMCC)

There are a complex variety of land zonings and town planning issues that influence on-site effluent management in this LGA, as well as a specific Development Control Plan (DCP) for effluent management. Further to zoning and planning issues, there are also numerous considerations such as native vegetation, steep land, climate, soil depth, surface waters, groundwaters and requirements for bushfire control.

In this LGA, on-site effluent management systems are normally only allowed on parcels of land having a 'usable' area in excess of 4000m^2. All development and the land application of wastewater must be then contained within a 'Principal Development Area' of up to only 2000m^2. Such an area also has prescribed boundary set-back distances of either 10m or 15m. There is also a 'blanket' area of 1000m^2 stipulated for irrigation from an aerated system for domestic dwellings with a wastewater loading of up to 1500 litres per day, as well as a non-preference for any form of system with absorption trenching. Due to the climatic influences, there is a current preference for subsurface dispersal instead of surface irrigation from aerated systems. Reference to Table 1 indicates that a relatively small percentage of septics occur in the rural lands in BMCC, whilst the aerated water treatment system (AWTS) is dominant. One in five systems installed in recent years have been Ecomax due mainly to the climatic conditions, small area required (relative to irrigation over 1000m^2) and the impositions of a Principal Development Area at only 2000m^2. Whilst watercourse buffer distances are normally enforced, one particular Ecomax system gained approval in a locality approximately 25m from an intermittent watercourse.

Lithgow City Council (LCC)

This LGA has a blend of unsewered larger rural properties and small acreage subdivisions. There is relatively minimal native vegetation to consider and the landform is dissected by intermittent and perennial watercourses that form the dominant environmental constraint in the region. Many different soil types are encountered as a function of the variable parent bedrock. SEPP 58 (1998) covers the bulk of the Lithgow Council area and the SCA control the approval process.

There is a blanket stipulation restricting the use of the absorption trench septic system on some small acreage properties in LCC. Over 50% of sites utilise the AWTS due to the high proportion of development related to subdivisions. The 34% of septics occur on larger properties with areas normally exceeding 5 – 20 hectares. The 4% of Ecomax systems relate to 'commercial' scale developments such as holiday cabins and new toilet/shower facilities at Lake Lyell. Irrigation areas are normally sized on the basis of the largest derived from water and nutrient balance assessments. Due to the influence of the SCA, watercourse buffer distances are typically strongly enforced in LCC. The only variation to the buffers has occurred on some existing Lots within subdivisions created prior to SEPP 58 or where a system such as Ecomax has been proposed.

Table 1: Trends Regarding Choice of Effluent Management System in a Variety of Local Government Areas

Local Government Area	Absorption trench septic %	AWTS with surface irrigation %	AWTS with sub-surface dispersal %	AWTS with absorption trench %	AWTS with advanced secondary treatment %	AWTS & recycle in dwelling %	Total AWTS %	Composting toilet & grey-water trench %	Ecomax %	Other * %
GROUP 1										
Blue Mountains	28	33	4	2	2	2	43	3	20	6
Lithgow	34	51	0.5	0	1	2	54.5	7	4	0.5
Oberon	100	0	0	0	0	0	0	0	0	0
GROUP 2										
Winge-carribee	20	20	0	0	0	0	20	20	40	0
Wollondilly	0	83	0	0	0	0	83	0	0	17
Shoalhaven	0	60	0	0	0	0	60	20	0	20
Mulwaree	17	66	17	0	0	0	83	0	0	0
Tallaganda	40	40	0	0	0	0	40	0	0	20
GROUP 3										
Hawkesbury	8	76	4	0	0	0	80	4	4	4
Pittwater	0	72	14	14	0	0	100	0	0	0
Hornsby	11	56	0	0	0	11	67	11	0	11
Baulkham Hills	0	36	0	14	0	0	50	0	28	20
GROUP 4										
Penrith	0	80	0	0	20	0	100	0	0	0
Campbell-town	0	100	0	0	0	0	100	0	0	0
Liverpool	0	17	17	0	66	0	100	0	0	0
Fairfield	0	67	0	0	0	0	67	0	33	0
Blacktown	0	100	0	0	0	0	100	0	0	0
GROUP 5										
Cessnock	0	80	20	0	0	0	100	0	0	0
Singleton	25	50	0	0	0	0	50	0	25	0

* Others include Dowmus (now out of business) and wetland ponds. NOTE: all data based on projects carried out by the Author.

Oberon Shire Council

In the unsewered parts of this LGA, there are mainly large acreage properties with minor subdivision and the creation of concessional lots. Due to the relatively high elevations that range from about 800 – 1300m AHD, the influence of the climate dominates the requirements for effluent management. There are also prescribed watercourses in the Shire that can affect effluent management.

In general, Council has a simple and effective approach to unsewered development. Detailed investigations are not normally required on lots larger than about 20 hectares. Due to the typically cold conditions in Oberon Shire and relatively prolonged periods of snow/frosts encountered, the use of the AWTS with irrigation is not permitted due to the potential for such a system to freeze on occasions. Irrespective of lot size, all recent developments since the inception of the Silver Book and AS/NZS 1547 (2000) therefore have the absorption trench septic system and watercourse buffer distance requirements from the guidelines are enforced.

GROUP 2

Wingecarribee Shire Council

Council has a DCP for effluent management and the Shire has large acreage properties, smaller acreages and unsewered residential lands in the northern villages. On large acreage properties where watercourse buffers can be achieved, there is almost an equal mix of septics and AWTS. On smaller acreages, the AWTS is the predominant system.

In the northern villages that remain unsewered where the Lot size is typically less than 1000m^2, the main system used is Ecomax (or basic sand mounds after secondary treatment). This is due to the inability to site irrigation areas large enough to satisfy water and nutrient balance assessments combined with the heightened potential to impact on adjoining properties where appropriate boundary set-back distances cannot be achieved. Council's insistence for this arrangement is at the preclusion of an AWTS, even when subsurface dispersal for land application and advanced secondary treatment is proposed.

Wollondilly Shire Council

Due to the prevalence of rural/residential small acreage subdivisions, there is a high percentage of the AWTS with a surface irrigation arrangement in this LGA. Absorption trench septics are precluded on these lands and the typical clay subsoil would result in excessive lengths, thereby making their use impractical. Irrigation areas are sized on the basis of the largest areas for water, nutrient and hydraulic assessments. The SCA covers much of this LGA and appropriate watercourse buffer distances are maintained.

Shoalhaven City Council

This LGA is situated in a coastal/escarpment environment and there is a mix of larger and smaller acreages, as well as unsewered villages such as Kangaroo Valley. There is also a DCP that details particular requirements in relation to effluent management. Strict controls are in place in drinking water catchments such as Kangaroo Valley, hence the prevalence of the AWTS for new developments on small acreages (60%) and the 20% of composting toilets.

GROUP 3

Hawkesbury City, Hornsby Shire and Baulkham Hills Shire Councils

These LGA have a combination of typically smaller acreage properties and unsewered villages such as Glossodia and Wisemans Ferry, some located near major rivers and waterways. Due to the relatively large areas with native bushland, issues in relation to flora, fauna and bushfire control commonly have a bearing on the requirements for effluent management. The AWTS is predominantly used (50 – 80%), but there is also a reasonable percentage of septics, composting toilets and Ecomax. Where possible, irrigation areas are sized on the basis of the largest area for water, nutrient and hydraulic assessments.

Many sites have areas of less than about 1000 - 2000m^2 that are rocky, comprise steep terrain and are positioned near dominant rivers and waterways. This largely accounts for the use of systems such as Ecomax and composting toilets. On the highly constrained sites, a given Council will normally accept a best-fit solution for effluent management. This has resulted in the unavoidable situation where effluent management systems are approved in localities that are much closer than 100m from perennial watercourses in these LGA. In some instances, wastewater from an aerated system is applied to the land with an absorption trench when large enough irrigation areas cannot be properly established.

Pittwater Council

This LGA has a combination of unsewered small acreage properties in suburbs such as Bayview and Ingleside, and residential sized allotments (typically less than 1000 – 1500m^2) in waterfront localities around Pittwater. Native vegetation is prevalent, particularly in the waterfront areas that are surrounded by National Park.

The prevalence of the AWTS in this LGA is a function of implementation of the septic safe program and system upgrades when dwellings are being extended or renovated. The sizing of irrigation areas is based solely on a hydraulic assessment and/or delineating the largest that is possible on a given site. Irrigation areas as small as about 150 - 200m^2 have been approved for dwellings in localities as close as 20m from the waterfront at Pittwater.

Whilst there is no strict adherence to watercourse buffer distances, slope stability and native vegetation are issues actively pursued throughout the whole LGA. The application of wastewater must not exacerbate slope instability or affect individual eucalypt trees or angophoras in the Pittwater spotted gum community. For given trees in the community, minimum buffer distances typically ranging from about 2 – 5m. This can complicate an irrigation design when the trees are randomly dispersed throughout a given area. It is slope and vegetation, combined with small Lot sizes, that has resulted in the 14% of AWTS with subsurface dispersal and 14% of the same with absorption trenching for land application.

GROUP 4

Penrith, Campbelltown, Liverpool, Fairfield and Blacktown City Councils

These LGA are dispersed throughout the majority of the remaining unsewered parts of western Sydney and individual properties typically range in area from about 0.5 – 3.0 hectares. With the same climatic and topographic conditions, as well as a consistent medium to heavy clay subsoil, the requirements for effluent management are somewhat similar. In most cases, the land has already been cleared and there are no concerns in relation to flora, fauna and bushfire control.

The AWTS is predominantly used because of the clay subsoil. Surface irrigation is mainly used for the same reason, with the exception of land application areas in relatively close proximity to market gardens in Liverpool City, where subsurface dispersal is stipulated. With the exception of Liverpool Council, irrigation areas are sized on the basis of the largest area for water, nutrient and hydraulic assessments. In Liverpool City LGA, water balance can be ignored to avoid irrigation areas that are 'too large'. Due to the location of certain suppliers across western Sydney, aerated systems with advanced secondary treatment are relatively common in Penrith and Liverpool City LGA.

The required watercourse buffer distances can usually be achieved on sites in the Group 4 LGA and there is limited steep land. Due to the pressure for vacant parcels of land in Sydney, one-acre subdivisions are being created on sometimes moderately to highly constrained sites. In Fairfield City where large homes are commonly built, one-third of the systems are Ecomax to overcome the need for large relatively irrigation areas.

5 Conclusions

From the trends in system type and the methodologies adopted to approvals in different LGA, it is seen that the approach to on-site effluent management is not consistent. This is a typical scenario for most things in the real world and unavoidable in this industry. Whilst the guidelines for effluent management have standardised certain issues, significant differences are encountered as a function of physical and environmental characteristics.

In light of the inconsistencies, it is considered that the level of input required for site assessments has increased across the board since inception of the relevant guidelines for effluent management. Due to the variety of types of effluent systems that have become available in recent years and the increased knowledge by Council and SCA staff, significantly improved outcomes with respect to wastewater management and environmental/public health are being achieved. Furthermore, a more reasonable approach is usually adopted by the consent authorities by allowing a best-fit solution to be implemented for effluent management on existing small and/or constrained Lots. This is largely a function of the improved variety of wastewater treatment technology and land application methods currently on the market.

It is considered that the inconsistencies encountered with respect to implementation of the guidelines for effluent management do not represent a flaw in the system. It is a matter of being able to recognise the physical characteristics and environmental constraints on a given site and then adopting the required approach in different LGA. This is a positive situation because of the benefits it is providing to public health and the environment as a whole.

References

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