DEVELOPMENT OF AN OSD POLICY FOR GOSFORD

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1. BACKGROUND

Gosford is located on the Central Coast of NSW, midway between Sydney and Newcastle.

The City of Gosford is generally bounded on the east by the Pacific Ocean and on the west by the Old Great North Road between Wisemans Ferry and Bucketty. The northern boundary of the City is located near the settlements of Kulnura, Central Mangrove, Somersby, Lisarow and Forresters Beach. The southern boundary, for the most part, runs through the middle of the Hawkesbury River at Broken Bay.

The Gosford Local Government Area (LGA) comprises an area of approximately 1,028 km^2 and has an annual rainfall of 130cm compared to Sydney which has 121cm.

The main urbanised area of Gosford is made up of approximately 21 major drainage catchments (see **Figure 1**). Most of these catchments either drain into the Pacific Ocean, Brisbane Water or Broken Bay. Most of the LGA consists of steeply sloping hills and narrow valleys with short flat plains at the toe.

2. FLOODING AND DRAINAGE PROBLEMS

In the late 1980's and early 1990's the City of Gosford received periods of heavy rainfall which resulted in the flooding of many houses and properties. At the time it was estimated that $80 million worth of flood mitigation and drainage improvements were required to alleviate the problems. With only limited funds for flooding and drainage, (approximately $600,000 per annum at that time), it would have taken Council close to 100 years to fix all the problems.

However under the Water Supply Act, Council was able to apply a levy of $40 to all properties which provided an extra $2 million per annum to Council's drainage budget. With the addition of this levy and governments grants, Council has been able to alleviate a proportion of its flooding and drainage problems.

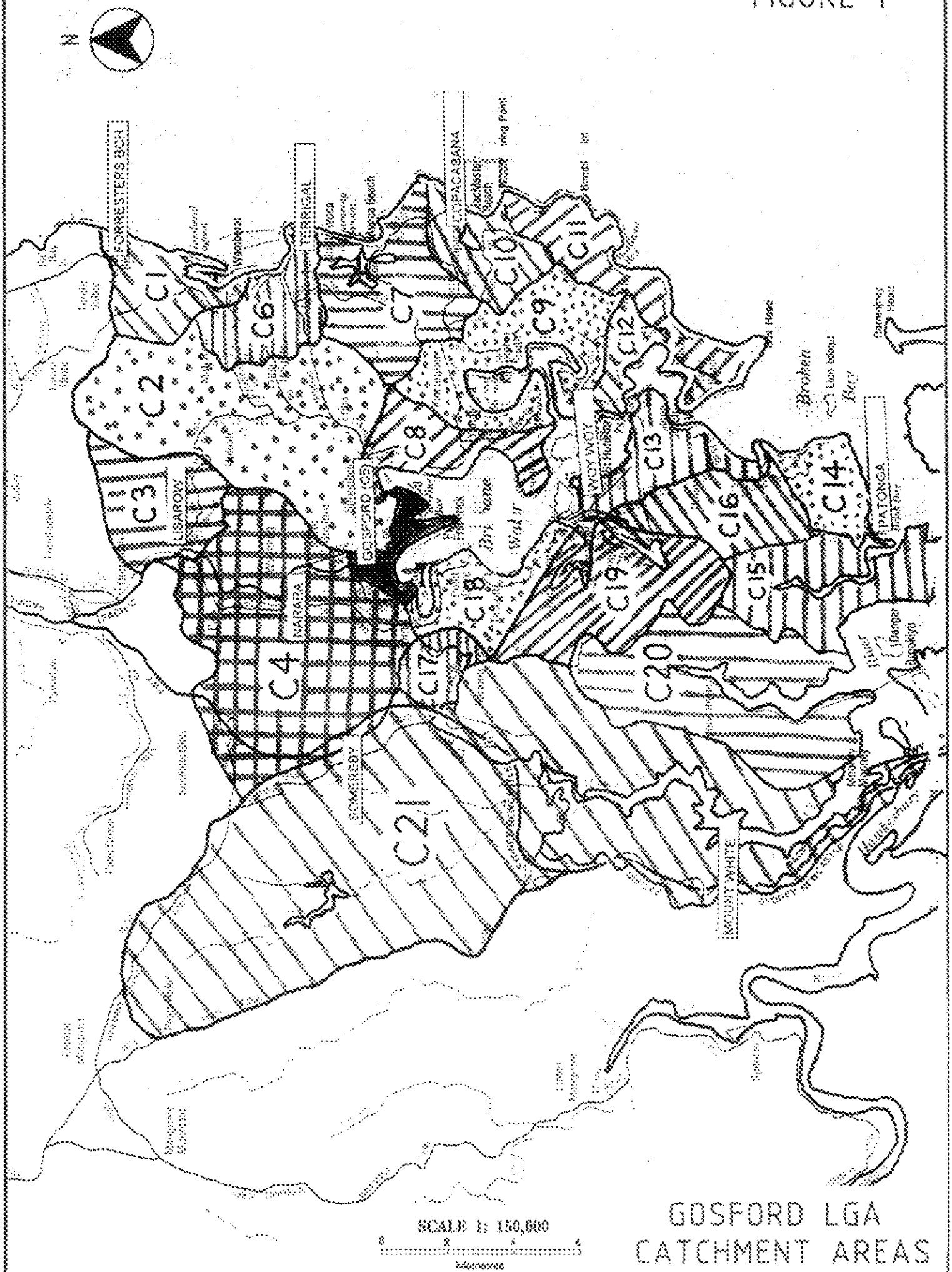
Gosford Council has considered the introduction of an on–site stormwater detention (OSD) policy for many years and has still not formally adopted a policy for the whole LGA. This is in contrast to the majority of councils in the greater Sydney area which have adopted such policies.

3. GOSFORD COUNCIL'S RELUCTANCE TO ADOPT A `BLANKET' OSD POLICY

Council believes there are unique issues in the Gosford area which have made the adoption of a`blanket' OSD policy, impractical and unsuitable. These issues are briefly discussed below.

Firstly there is a wide variation in topography both within and between Gosford's 21 catchments. In a large proportion of these areas, urban development is located close to the receiving water body with no major flooding problems between the development and the receiving waters. In these cases it would seem unnecessary to retard flows through OSD systems. In addition, soil permeabilities vary considerably and in some sandy areas, groundwater infiltration is a partial or sole means of stormwater disposal.

FIGURE 1



GOSFORD LGA
CATCHMENT AREAS

Secondly, Council has to date upgraded many of the trunk drainage systems and has included provisions within these upgrades, for future development. In these areas, or in areas where upgrading is imminent, the provision of OSD is seen as unnecessary.

Thirdly, Council has been sceptical about whether OSD systems can be properly maintained in the future, whilst in private ownership, and has noted the experience gained from studies in Sydney that suggest that a large number of OSD storages are not operating as designed. Council believes that in some cases, monies spent on OSD storages may be more efficiently spent on trunk drainage improvement works, for which Council is responsible for future maintenance.

4. PRINCIPLES GUIDING DEVELOPMENT OF OSD POLICY

As with the development of any new policy, it is important that the underlying principles and objectives be developed through proper consultation. Within Council, this process has been going on for some years. The details presented in this paper are the draft recommendations of a working group comprising four Council staff and three consultants, which has been considering OSD policy options for the last six months. The draft policy has yet to be further refined through a final review by Council and the community.

The key principles embodied in the draft OSD policy are discussed below.

4.1 Preference For Community Basins

Council prefers the construction of community basins in lieu of individual site OSD. The term 'community basins' refers to larger basins constructed on public land and owned and operated by Council. Council believes such basins are more cost efficient than smaller basins, and given the maintenance problems associated with privately owned OSD storages, there is reasonable certainty that community basins will continue to operate as originally designed.

4.2 Selective Application Of OSD

As discussed in **Section 3** above, Council believes that a 'blanket' OSD policy is inappropriate for Gosford. It is therefore proposed to require OSD only in selected subcatchments, where the specific problems and characteristics of these subcatchments indicate that no other alternative is practical. These subcatchments would be shown on maps and updated from time to time, allowing additional OSD areas to be added, or existing areas removed.

4.3 OSD To Address Both Flooding And Environmental Issues

OSD subcatchments would be identified upstream of known flooding problems and/or, upstream of areas of environmental significance or where an erosion hazard exists. This would include environmentally sensitive areas, national parks, rainforests, wetlands, etc.

4.4 Existing Building Lots Excluded

OSD will not be required on existing vacant residential lots with development approvals which have not recognised the need for OSD.

4.5 OSD Design Parameters To Be Specified By Council

For reasons of cost efficiency and consistency, Council would specify the OSD site storage requirement (SSR) and permissible site discharge(PSD) for each individual development. To this end, Council is currently developing storage and discharge parameters on a per hectare basis, for application across Gosford. Where special circumstances exist or where large developments are proposed, Council may accept alternative OSD calculations from the developer, provided these are based on a comprehensive analysis of the catchment.

Council has currently engaged consultants to carry out hydrologic modelling of typical catchments to determine appropriate SSR and PSD values to be applied on a catchment basis. This analysis is proceeding using the

ILSAX model to test various development scenarios within a typical catchment, and to determine the resultant SSR and PSD needed to ensure that flood flows are not exacerbated at any points in a catchment. The models are also being used to test the sensitivity of the resultant SSR and PSD values to changes in soil types, catchment slopes and development sizes.

4.6 Encouragement For Alternatives To OSD

Council recognises that in many catchments which have existing flood problems, OSD is the only alternative available to Council. However in some catchments, Council believes improvements to the existing trunk drainage system may yield greater benefits, at a cheaper price, than OSD. In these catchments, Council wishes to encourage developers to consider alternatives to OSD. These alternatives would be identified during negotiations between Council and the developer, after the Conditions of Consent for the DA had been prepared.

4.7 Infiltration And On–Site Stormwater Use

Council wants to encourage measures to maximise infiltration to groundwater and on–site use of stormwater (e.g. rainwater tanks) in an attempt to restore the level of runoff and infiltration on each site towards natural levels.

The reasons for this objective are twofold. Firstly, there are some catchments within Gosford where groundwater is important, both as a resource and as a contributor to surface flooding problems. Secondly, it is recognised that degradation of stream habitats is being exacerbated by additional volumes (and not solely peak flows) of stormwater being directed to these systems.

5. TREATMENT OF INFILTRATION AREAS

As noted above, Council wishes to increase on–site infiltration, where development has reduced infiltration from natural levels. In catchments where infiltration measures are practical and where there are no adverse geotechnical or flooding impacts, infiltration may be used to complement OSD. At present, the only suitable area identified for this purpose is the Woy Woy sand plain.

Council will be developing guidelines for the sizing of such infiltration systems in the near future. It is also recognised that these systems provide nutrient removal benefits and are consistent with Council's existing draft nutrient control policy.

6. SELECTION OF AREAS WHERE OSD IS TO APPLY

Some measures within the draft OSD policy will apply to the whole of Gosford whilst others will apply only to specific OSD subcatchments. These measures and the methodology used to select the OSD subcatchments, are summarised below.

6.1 Measures Applicable To All Of Gosford

a) All land zoned 5a, 5b and 5c (ie. the special use zones) and major redevelopment sites (i.e. sites larger than 3,000m^2) will be subject to OSD, irrespective of whether or not the sites are within an OSD subcatchment.

b) Rural areas including open space, scenic protection and national park zones, will not normally be subject to OSD. In these areas, Council will condition developments to ensure runoff generated from buildings, tracks and paved areas, is directed to absorption trenches or heavily vegetated areas to prevent an increase in runoff and/or erosion problems.

c) OSD will be necessary for sites located upstream of environmentally sensitive areas.

6.2 Measures Applicable To Specific OSD Subcatchments

Within the residential, commercial and industrial zones located within OSD subcatchments, OSD systems will be required as part of new developments. Council will provide the SSR and PSD for each development within its development consent conditions.

6.3 Methodology Used To Select OSD Subcatchments

Council is currently in the process of preparing maps showing subcatchments within Gosford where OSD is to apply. These maps have been prepared by:

- adding areas upstream of:
  - serious flooding problems (usually above floor level flooding), where these are known;
  - potentially serious flooding problems, should development within the existing zonings continue to take place;
  - valuable creek habitats that need to be protected from increases in peak discharges;
- subtracting areas:
  - which are now protected by improvement measures recently implemented by Council;
  - which are anticipated to be protected by improvement measures as currently proposed within Council's Three Year Works Program;
  - where there is a Section 94 contribution plan in place to address flooding and drainage problems;
  - where OSD has little benefit or may possibly aggravate downstream flooding problems.

The OSD subcatchment maps will be varied from time to time as new drainage and flooding problems are identified, or as existing problems are eliminated through implementation of improvement measures.

7. SUMMARY

a) Given the topography and other unique characteristics of Gosford, Council believes the application of a `blanket' OSD policy across the whole of the LGA is inappropriate.

b) Council's draft OSD policy favours alternatives to OSD wherever possible. These alternatives include the construction of community basins and developer contributions to trunk drainage improvement works.

c) Council will not require OSD unless there are demonstrated flooding or drainage problems downstream, or there is a significant potential for these problems to exist, or there are valuable creek habitats that need to be protected from peak discharges.

d) Infiltration and maximisation of on–site use of stormwater is encouraged, where such measures will not aggravate existing geotechnical or flooding problems.

e) Council is developing maps showing areas of residential, commercial and industrial land where OSD systems are necessary. These maps will be dynamic and updated as new flooding information comes to hand, or as improvement works are constructed.

f) Council will provide developers with SSR and PSD design values to improve efficiency and consistency within the application of the OSD policy. Council is currently developing catchment wide SSR and PSD values (on a per hectare basis) through detailed hydrological modelling of typical catchments and development scenarios.

g) In rural or semi rural areas, disposal of stormwater to infiltration trenches or to heavily vegetated areas may be used as an alternative to OSD.