

1. INTRODUCTION

The adverse impacts from sediment deposited in waterways are well recognised as a primary contributor to the degradation of waterways and water quality. Regulation by planning and building authorities is used to reduce the amount of erosion, sedimentation and nutrient export associated with the development of land.

On the Swan Coastal Plain and particularly in the Darling Range, there is increased evidence of adverse impacts from sediment deposition in waterways. These impacts include:

- Nutrient enrichment and eutrophication of our rivers, as phosphorus and nitrogen bind to eroded particulates;
- Reduced capacity of flood ways, particularly as weeds grow on deposited sediment, stabilising it into permanent barriers;
- Adverse impacts on native fauna (including fish) from turbid water reaching the watercourse, weed growth on new sediment and loss of river pools and deep water habitat.

The causes of these impacts are related to the export of sediment, for example from turbid water reaching the watercourse, which results in weed growth on nutrient-rich sediment, and consequent loss of river pools and deep water habitat through siltation. In many cases these processes are exacerbated by land development.

The costs and difficulties associated with remediation of these impacts are significant. Control of sediment from erosion at source is considered to be a more cost-effective measure. Effective control of erosion and sediments is considered to be best management practice.

In section 2.2.1.5.4 of The Institution of Public Works Engineering Australia (WA Division Inc) (IPWEA) Subdivisional Guidelines (Edition No. 2 – 2009) it states:

Prior to the commencement of any works on a development site involving the movement of soil and/or sand, the developer shall submit a site classification assessment and soil stabilisation strategy in accordance with “Land Development Sites and Impacts on Air Quality - A Guideline for the Prevention of Dust and Smoke Pollution from Land Development Sites in Western Australia” (DEC 1996).

It is the intent of this policy to broaden the scope of the soil stabilisation strategy required by the IPWEA WA Guidelines to also address the potential for water erosion in the Darling Range.

The Upper Canning Southern Wungong Catchment Team, which covers the Cities of Armadale and Gosnells, has prepared an *Erosion and Sedimentation Control Manual for the Darling Range, Western Australia*. The Manual reviews best practice in eastern Australia and provides recommendations for best management practice erosion and sedimentation control based on an assessment of local soil and rainfall conditions.

This policy seeks to ensure best management practice erosion and sedimentation control measures are implemented for all land use, subdivision and development in the City of Armadale to prevent sediment reaching waterways.

2.0 POLICY OBJECTIVES

- a) To assist in protecting the beneficial uses of the Canning River and watercourses, consistent with the Swan and Canning Rivers Management Act 2006. In particular, by preventing adverse impacts from sedimentation of eroded material, this policy seeks to enhance protection of the following beneficial uses of the Canning River and waterways:
 - As a habitat for:
 - Locally indigenous fauna, including migratory and threatened species; or
 - Locally indigenous flora, including threatened species;
 - For the maintenance of the diversity and abundance of locally indigenous fauna and flora species;
 - To provide a biologically productive and genetically diverse natural environment;
 - To maintain ecological processes;
 - Together with their beds, banks and contours, the use of fringing native vegetation as an important element of the natural landscape of the policy area.
- b) To reduce turbidity of runoff from disturbed sites by taking measures to prevent erosion and detain any sediment.

3. APPLICATION OF THE POLICY

3.1 Local Structure Plans or Outline Development Plans

Local structure plans or outline development plans should ensure the potential for erosion is minimised. The following guidelines should be considered (where practical) in the preparation and assessment of Local structure plans or outline development plans:

- The erosion risk should be assessed using the Work Sheet reproduced as Attachment 1 to this policy;

- Roads should be located on or parallel to ridges and have gentle slopes generally following contours or be located perpendicular to the contours if necessary. Roads should not be placed obliquely to contours. Consideration may need to be given to visual amenity in the location of roads;
- Lot boundaries or roads should not cross watercourses if it can be avoided;
- Lot orientation should maximise boundary length along contours and minimise boundary lengths down slopes. If practical, in order to minimise the need to construct cross-drains on firebreaks, property boundary lengths should not exceed 80m for slopes of less than 10% or 35m for slopes greater than 10%;
- The location of existing or proposed erosion prevention control measures such as diversion drains, level spreaders or level sills, level banks, and contour banks or contour sills should be indicated on the plan;
- Strategic Firebreaks/Fire Access Ways should be utilised if lot boundaries have steep slopes;
- Strategic Firebreaks/Fire Access Ways should have gentle slopes (ie less than 10%) to reduce the likelihood of erosion and need for cross drains; and
- Stands of remnant vegetation should be retained where practical and should not be fragmented by lot boundaries. Revegetation to prevent or control erosion should be utilised where appropriate and practical.

3.2 Subdivision

Where the City of Armadale is of the opinion that soil stabilisation is likely to be necessary to prevent erosion from drainage run-off during or after subdivision construction, it will recommend appropriate subdivision Conditions and Advice to the Western Australian Planning Commission's to ensure this matter is addressed.

The City will have regard to whether the procedure below has been followed by the developer to address the matter discussed in the preceding paragraph:

- (a) An Erosion Risk Assessment has been carried out for areas to be disturbed by subdivisional works using the Work Sheet reproduced as Attachment 1 to this policy;
- (b) The soil stabilisation plan has been prepared consistent with the development approaches identified in Table 3 of the Work Sheet reproduced as Attachment 1 to this policy; and
- (c) Erosion and sedimentation control measures described in Section 5.2 of the *Erosion and Sedimentation Control Manual for the Darling Range, Perth Western Australia* have been considered and applied where appropriate and practical.

3.3 Development

Where the City of Armadale is of the opinion that soil stabilisation is likely to be necessary to prevent erosion from drainage run-off from a proposed

development during or after construction, it will apply appropriate conditions and advice to ensure this matter is addressed.

4.0 DEFINITIONS

“Best management practice” means best management practices identified in the Upper Canning Southern Wungong Catchment Team’s Erosion and Sedimentation Control Manual for the Darling Range, Perth Western Australia.

“Beneficial uses” in this policy are uses of the environment that are required to be protected under Western Australian law, namely the *Environmental Protection Act (1986)*.

“Local structure plan/ outline development plan” means any plan that is intended to guide the pattern of land use, subdivision and development.

POLICY ATTACHMENT 1

EROSION AND SEDIMENT CONTROL MANUAL - WORK SHEET

Site Location (Lot No.) _____

Proposed area of disturbance at the site _____

Catchment area upslope of the site _____

Upslope catchment characteristics (ie % cleared) _____

Average gradient of the site _____

(Note slope gradients may be changed by works at the site).

Other features such as the natural drainage lines etc. _____

EROSION RISK ASSESSMENT

Table 1 Soil Erodibility Potential

| Soil Erodibility Potential | Soil Description | Group Symbol | Emerson Class No. |
|----------------------------|---|----------------------------|-------------------|
| Low | Sandy gravels | GP | >2 |
| Moderate | Non dispersive and slightly dispersive clays and clayey sands, clayey gravels, silty gravels, sands | CH, CL, CI, SC, GC, GM, SP | >2 |
| High | Silts, silty sands, fine sands, dispersive clays and clayey sands, water repellent sands | ML, SM, CH, CL, CI, SC | 1, 2 |

Table 2 Erosion Risk Assessment by Soil Loss Class

| Soil Erodibility Potential (as defined in Table 1) | Site Slope 5% - 10% | Site Slope 10% - 20% | Site Slope > 20% |
|--|---------------------|----------------------|------------------|
| Low | 1 | 1 | 1 |
| Moderate | 1 | 1 | 2 |
| High | 1 | 2 | 2 |

Table 3 Development Approaches

| Development Approaches | Soil Loss Class | |
|---|-----------------|----------|
| | 1 | 2 |
| | Action | Action |
| Planning of control measures as part of an ESCP | Recommended | Required |
| Implement control measures described in Section 3 of the Manual where appropriate | Required | Required |
| Staged Construction and Progressive rehabilitation | Consider | Required |
| Divert runoff around the site | Consider | Required |

Site Soil Loss Class (based on Tables 1 and 2) _____

Proposed Control Measures _____

D106/6/03 Development Services Committee 9 June 2003 - Adopted by Council 16 June 2003

D160/9/04 Development Services Committee 13 Sept 2004 - Adopted by Council 20 Sept 2004

D25/4/13 Development Services Committee 15 April 2013 - Adopted by Council 22 April 2013