Section 20 - Erosion and Sediment Control

INTRODUCTION

This Development Control Plan was developed based on the Erosion and Sediment Control Regional Policy and Code of Practice prepared by the Department of Land and Water Conservation, Hunter Catchment Management Trust and the Lower Hunter & Central Coast Regional Environmental Management Strategy incorporating the areas of the Central Coast, Hunter, Karuah Great Lakes and Manning Regions of NSW.

This Section contains the following subsections:
20.1 – Legal requirements
20.2 – Erosion and sediment control planning
20.3 – Management of erosion and sediment control
20.4 – Environmental performance bond
20.5 – Exempt works

This section of the DCP relates to land within the Shire of Muswellbrook to which the Muswellbrook Local Environmental Plan applies, which may be impacted by private and public building work, developments, subdivisions and activities subject to the assessment and consent/approval of Council under provisions of Parts 4 or 5 of the Environmental Planning and Assessment Act 1979 and/or under the Local Government Act 1993 for any proposal or practices which will or could involve:

- The disturbance of or placement of fill on the soil surface, and/or result in change to the contours of the land
- Change in the rate and/or volume of runoff flowing over land or directly or indirectly entering “waters” as defined under the Protection of the Environment Operations Act 1997.

OBJECTIVES & CONTROLS

Objectives:

a) To apply appropriate erosion and sedimentation controls on individual development sites;
b) To demonstrate through the preparation of an Erosion and Sediment Control Plan or Strategy for developments over 250 m^2 of disturbance that appropriate controls are planned to be installed;
c) To identify all aspects of site disturbance, erosion and sediment control and address with appropriate control measures;
d) To stage works as required to reduce potential for erosion and sedimentation to occur;
e) To remove existing vegetation only as required;
f) To address site rehabilitation for the duration of the project;
g) To provide a mechanism for any remaining exposed soil to be treated and for ongoing site maintenance;
h) To cover the contingency of change or delay in the project implementation, activity or work scope.

Controls:

(i) Areas of disturbance less than 250 m^2 which are environmentally sensitive (ie within 100m of a water course), on steep sites (gradient greater than 20^o) require the completion of an Erosion and Sediment Control Plan;
(ii) Areas of disturbance 250 m^2 to 1000m^2 must submit an Erosion and Sediment Control Plan and a schedule of works with a development application;
(iii) Areas of disturbance 1000 m^2 to 2500 m^2 must submit an Erosion and Sediment Control Plan and Landscape Plan with a schedule of works with development application;
(iv) Areas of disturbance greater than 2500 m^2 must submit Erosion and Sediment Control Plan, a Soil and Water Management Plan and a Landscape Plan with a schedule of works;
(v) All subdivisions which are proposed as staged developments must provide a staged Erosion and Sediment Control Strategy with an associated schedule of works;
(vi) Completion of the Erosion and Sediment Control Plan must be undertaken by a suitably qualified person in accordance with this section of the DCP and contain all elements detailed by 22.2;
(vii) A regular maintenance program for all erosion and sediment controls must be submitted with any plan or strategy;
(viii) Existing vegetation must not be cleared in areas not relevant to direct impact from the development;
(ix) Vegetation must not be cleared prior to development approval being granted or before erosion and sediment controls are fully installed;
(x) All proposed controls must be consistent with this section of the DCP and the *Managing Urban Stormwater: Soils and Construction* manual prepared by Landcom.

DEVELOPMENT CONTROL ELEMENTS

20.1 LEGAL REQUIREMENTS

Failure to comply with the requirements of this section may result in action being taken by Council, or another responsible authority, under relevant legislation. Proponents need to be aware of the extensive amount of legislation relating to the protection of soil, water, habitat and land resources of the NSW environment. Relevant sediment and erosion legislation includes the following:

(a) Environmental Planning and Assessment Act 1979
(b) Protection of Environment Operations Act 1997
(c) Local Government Act 1993
(d) Soil Conservation Act 1938
(e) Rivers and Foreshores Improvement Act 1948
(f) Crown Lands Act 1989

The applicant is responsible for satisfaction of all legislative requirements associated with the activity approval. Council will consider necessary action to be taken under the

relevant legislation if approved erosion and sediment control measures are not carried out or regularly maintained.

Options include, but are not limited to: the issue of an Order or infringement notice under one of the Acts listed above, the charging of a reinspection fee, the forfeit or partial loss of an environmental bond, the issuing of stop work notices and/ or other legal action.

If the proponent or other agents cause damage to any structure or surface that is the responsibility of Council while carrying out works to comply with this Code, repairs will be undertaken immediately at the proponents cost.

20.2 EROSION AND SEDIMENT CONTROL PLANNING

(i) Erosion and Sediment Control Strategy (ESCS)
Major proposals that are staged over an extended period requires the completion and submission to Council of an Erosion and Sediment Control Strategy which include staged Erosion and Sediment Control Plans and a schedules of works for implementation. The fundamental issues are:

- Erosion control measures need to be applied within the site to minimise erosion;
- Coordinate works to minimise the disturbed areas and apply appropriate staged controls to the progress of the development;

(ii) Erosion and Sediment Control Plans (ESCP)
An Erosion and Sediment Control Plan (ESCP) is essential for any development with potential to cause significant soil erosion and sedimentation. The greater the potential for these impacts the more detailed the plan. For example, a small development may require a simple sketch with accompanying notes but a large complex development would need a comprehensive plan, documentation and design/construction data.

An Erosion and Sediment Control Plan must be approved by Council prior to the commencement of any works onsite. This plan will contain a schedule of works for implementation that addresses all aspects of site or vegetation disturbance, runoff, flow rate change, erosion and sediment control, ongoing maintenance and site rehabilitation for the duration of the project.

This plan may be required to be modified by the proponent as required to achieve erosion and sediment control throughout the life of the development or activity.

(iii) Aims of an Erosion and Sediment Control Plan
The ESCP should be prepared by a suitably accredited or experienced person. It can be a “stand alone” document or incorporated into a site management or construction plan that shows drawings and notes that the site personnel can fully interpret and implement. Such plans are not limited to erosion and sediment control, but may also address other water quality and/or quantity issues during the construction and operational stages of an activity.

(iv) Structure of Erosion and Sediment Control Plans
The degree of detail supplied by the proponent to Council depends on:

- The scale of the activity

- The area of potential disturbance
- The complexity of the site characteristics e.g. slope, soil type
- The sensitivity of the adjoining environment.

Where an Erosion and Sediment Control Plan is required it should be prepared in accordance with the broad structure set out below. The ESCP must be submitted to Council with all necessary supporting information to allow a critical review and approval.

(a) Site characteristics – including:
- Locality plan (1:1000 scale)
- Existing contour data
- Catchment area boundaries
- Principal geographic features
- Natural water flow patterns
- Critical natural areas (eg. River, wetlands)
- Location and limitations of major soil types
- Location, nature and condition of existing vegetation
- Soil subsidence
- Climatic data including rainfall and storm events.

(b) Clearing and disturbance of site – including:
- Nature and extent of vegetation to be cleared, including area and depth of clearing
- Scheduling and time of proposed disturbance
- Methods of site clearance
- Final site contours data
- Identify areas of cut and fill, location of stockpiles and spoil/vegetation dumping proposals.

(c) Existing and proposed drainage patterns – including:
- Catchment Boundaries
- Existing watercourses or drainage patterns flowing through or adjacent to the site
- Location and extent of impervious surfaces
- Location and capacity of the proposed temporary and permanent site drainage or stormwater system.

(d) Erosion control practices – including:
- Location, design criteria and construction details of temporary control measures to be implemented
- Location, design criteria and construction details of permanent control measures to be implemented;
- Scheduling details of works to be undertaken
- Monitoring and maintenance details.

(e) Sediment control practices – including:
- Location, construction details and design criteria of temporary and permanent control measures

- Scheduling details of works to be undertaken
- Monitoring and maintenance details.

(f) Rehabilitation program – including:

- Location of temporary and permanent revegetation sites
- Materials and species selection
- Application and planting methods
- Types and rates of fertilisers and other soil ameliorants
- Mulching details
- Scheduling details of planting and maintenance works
- Monitoring and maintenance details.

(v) Plan Variations

An ESCP needs to demonstrate that appropriate controls have been planned to minimise erosion and soil movement both on and off the site.

Complex plans completed for disturbance areas over 1000m^2 need to include specifications and calculations which illustrate that the control measures have a completed capacity that exceeds the calculated output anticipated from the catchment during the proposed project or stage.

Review and variation of the original ESCP or ESCS may be required during the life of the development. However where the site conditions necessitate the modification of a plan, changes must be endorsed by Council.

(vi) Sample Erosion and Sediment Control Plan

Sample residential development ESCP that provide a guide for proponents in the creation of a site specific drawing for submission to Council are attached as Appendix B. Copies are also available from Councils Administration Centre.

20.4 MANAGEMENT OF EROSION AND SEDIMENT CONTROL

(i) Introduction

The requirements for a plan, strategy or control measures depend on the area to be disturbed and the type of activity as set out in Table 1:

Table 1:

Disturbance	Activity Type	Scope of Works
<250 m^2	House extensions, small driveways, garages	No Erosion and Sediment Control Plan required, except for environmentally sensitive (such as that within 100m of a water course) and very steep sites (gradient greater than 20^o), but proponents are expected to follow the general principles of this section of the DCP
250 to 1000 m^2	Houses, small commercial development, long driveways, small subdivisions	Erosion and Sediment Control Plan and schedule of works for implementation required
1000 to 2500 m^2	Houses, medium/high density houses, small civil infrastructure / commercial / industrial development, small subdivisions, etc	Erosion and Sediment Control Plan and a Landscape Plan with their associated schedule of works for implementation required. A staged Erosion and Sediment Control Strategy is required for developments which are proposed for extended periods of time (longer than 12 months) or those that will be staged over a period of time.
>2500 m^2	Extensive medium/high density houses, large civil infrastructure / commercial / industrial development, subdivisions, etc	Erosion and Sediment Control Plan and a Soil and Water Management Plan and a Landscape Plan with their associated schedule of works implementation required A staged Erosion and Sediment Control Strategy is required for developments which are proposed for extended periods of time (longer than 12 months) or those that will be staged over a period of time.

(ii) Compliance Responsibility

The proponent is responsible for the full cost of all work required to comply with this Section of the DCP, as determined by Council. Any off-site damage resulting from the activity is also the responsibility of the proponent. All erosion and sediment control measures or works and rehabilitation measures must conform to or exceed the specifications or standards set out in the *Managing Urban Stormwater: Soils and*

Construction manual prepared by *Landcom.*

(iii) Development Control
While carrying out any approved work covered by this section of the DCP, the proponent must minimise erosion and retain sediment eroded by water or wind on the development site.

This will involve as a minimum those requirements listed below to meet this objective:

- Erosion and Sediment Control Plan (ESCP)

Installation and maintenance of the erosion and sediment controls set out in the approved Erosion and Sediment Control Plan or Strategy, or associated development/activity approval conditions of consent and the associated vegetation clearing and works implementation schedule.

- Access

(a) Where possible, a single access (3 to 5 metres width per lane) shall be provided to the building facadé.
(b) A layer of 30mm to 60mm aggregate at a depth of 200mm must be applied to the access for stabilisation. For those accesses which may receive consistent heavy traffic geotextile fabric may be used as an underlay. This aggregate must be reinstated as required if soil is able to be tracked from the site onto adjoining properties or roadways.
(c) The proponent must control vehicular access to prevent sediment being tracked onto adjoining lands and roads. Aggregate and any construction site sediment on sealed roads must be thoroughly swept and removed to prevent this material entering the drainage system. Runoff from access surfaces must drain into an approved sediment trap device, and be treated where required before release from the development site.

- Groundcover

(a) A turf filter strip shall be installed and maintained along the road nature strip/footpath area adjacent to street kerbs (or along the downslope boundary It is to act as a final filter for the runoff leaving the property. Any exposed soil on the footpath and allotment shall be seeded or otherwise revegetated to limit runoff water and sediment. Existing groundcover may also be retained during clearing works to accommodate this requirement.
(b) In areas where the property is adjacent to bushland, care is needed to prevent the spread of turf grasses or hydromulch material beyond the rehabilitated area. Use of tree mulch or sterile seed/grass stock or native seed/seedling may be preferable to pasture species or couch turf in such locations.

- Roof Water Disposal

(a) All roof guttering and downpipes (temporary downpipes are acceptable) shall be installed and connected to Council's drainage system immediately after roof material fixing. If this connection cannot be made immediately, then additional onsite sediment control devices must be installed to receive and mitigate roof water runoff.
(b) Where no Council drainage system is provided, the roof stormwater shall be discharged away from the building site onto a stable vegetated area within the property boundary with sediment control devices installed.

- Sediment Control

(a) A sediment fence shall be installed to provide a temporary barrier or filter geotextile structure that captures sediment from the sheet flow runoff. It will be located within and/or along the downslope boundary of any construction site or upstream of a turf filter strip or native vegetation. Generally sediment fencing is restricted to small catchment areas with a slope length of less than 60 metres, and away from concentrated flow paths.
(b) Sediment traps will be installed to provide a temporary sediment control measure to intercept and retain sediment laden runoff in an excavation and/or an embankment located at all points where stormwater can leave a construction site or enter a drainage system. On sites with highly dispersible or erodible soil Council requires runoff within sediment traps to be filtered of flocculated before the water is released to the environment.
(c) Use of water runoff detention and sediment interception measures, where required. These will reduce flow velocities and prevent disturbed material (including topsoil, sand, aggregate, road base, spoil or other sediment) escaping the site or entering any adjacent lands or receiving waters.
(d) For a proposal within a disturbed area greater than 5 hectares, the proponent must demonstrate that runoff frequency or peak downstream of the development will not be increased. This must be demonstrated through calculations and modelling undertaken by a suitably qualified person.
(e) Sediment detention basins will be installed if total sediment volume calculated for the proposal catchment exceeds 150 cubic metres in the design Annual Recurrence Interval (ARI) 5 year storm event. These basins must be maintained until consent conditions are fulfilled.
(f) Where the subsoils within the development site contain more than 10% dispersal soils material, the proponent will capture and treat all runoff to a level specified by the Department of Environment and Climate Change (DECC) before discharge to receiving waters.
(g) Wind erosion mitigating practices and associated sediment interception structures must be applied to the land to reduce wind erosion where required.
(h) Appropriate water and wind erosion control measures will be in place before land is disturbed and maintained until effective land stabilisation is completed.

(iv) Runoff Water Control

During the implementation of any approved work covered by this section, the proponent must retain sediment eroded by water on the development site. This can be achieved by carrying out as many of the following principles and practices as are required to meet this objective:

(a) Intercept and divert all uncontaminated runoff around all areas to be disturbed. Alternatively runoff can be directed through these areas in a controlled manner;
(b) Control all runoff from the proposed development which is likely to cause flooding or erosion of downstream watercourses with appropriate drainage, channel or detention works. These works can be located above, within or below the approved development site provided that these measures are located on private land with the approval of the property owner.
(c) Ensure all drainage conduits and related structures are completed before they are commissioned.

(v) Rehabilitation
The proponent will carry out progressive land surface stabilisation on all disturbed areas until the site is satisfactorily rehabilitated, and where appropriate, landscaped to the satisfaction of Council.

(vi) Topsoil and Stockpile Management
(a) Topsoil will only be stripped from approved areas to a predetermined depth. It must be stockpiled separately from subsoil for re-use during site rehabilitation and landscaping, or removal if there is an excess. Subsoil spoil not required may be removed or placed on-site, in approved areas, shaped to appropriate land contours, topsoiled and stabilised by the proponent.
(b) Stockpiles of topsoil, sand, aggregate, spoil, building products or other material shall be stored within the boundary of the property at least 2 metres clear of any drainage line or easement, natural watercourse, footpath, kerb, road surface or established tree.
(c) Stockpiles must not be greater than 2m in height.
(d) Stockpiles must have measures in place to retain such materials on the stockpile. Controls shall be installed or constructed to divert stormwater flows away from stockpile areas.
(e) Stockpiles must not be placed so as to encroach on erosion and sediment controls which have been installed, stabilised accesses or the nature strip.
(f) The land adjoining the stockpile shall be protected from degradation by the implementation of erosion and sediment control measures such as a diversion drain, sediment fence, geotextile or other approved devices.

(viii) Erosion and Sediment Control Maintenance
All erosion and sediment control measures must be maintained at workable capacity or condition until permanent rehabilitation measures are fully operational.
(a) All erosion and sediment control measures, including permanent sediment traps, shall be maintained as per the schedule of works within the approved Erosion and Sediment Control Plan or Strategy (or as required). At least 70% of their design capacity is to be operational until they are decommissioned.
(b) All material removed from erosion and sediment devices must be either stabilised in situ or removed to an approved disposal site.
(c) Decommissioning of erosion and sediment control measures must comply with the schedule of works within the approved Erosion and Sediment Control Plan, Strategy or associated develop/activity conditions of consent. Material held in sediment control measures during decommissioning shall be either stabilised in situ or removed to an approved disposal site. All structural materials used to construct temporary erosion and sediment control measures are to be dismantled and removed from site on decommissioning.
(d) All site debris and unused construction material must be removed from the site or protected from erosion before the site is vacated.

20.5 ENVIRONMENTAL PERFORMANCE BOND
Council may require the proponent to lodge a bond. This is to ensure effective erosion and sediment control measures and rehabilitation works are implemented and maintained. The bond can be required for any activity deemed by Council including the

following situations:

- Proposals adjacent to environmentally sensitive areas
- Proposals with a disturbed area greater than 5 hectares
- Proposals involving exposure or disturbance of the land surface for periods greater than 6 months.

20.6 EXEMPT WORKS

The following situations are exempt from this Code of Practice:

(a) Emergency Situations – This policy does not apply to land uses and/ or activities such as emergency flood mitigation or to emergency bushfire backburn operations. It also does not apply to other such specific land uses more appropriately addressed by separate policies. However, after the emergency situation has passed, remedial measures should be undertaken to address any erosion hazard and to rehabilitate the site in a manner consistent with this section of the DCP.

(b) Bushfire Management – Trails and tracks for bushfire prevention and control can be constructed and maintained provided they comply with the appropriate guidelines for fire trail construction and maintenance such as the Department of Land and Water Conservation's Guidelines for Fire Trail Construction and Maintenance, or a Plan prepared in accordance with section 41A of the Bushfires Act (1949).

APPENDIX A - DEFINITIONS

The following glossary of terms is provided in relation to Erosion and Sediment Control:

Activity

a) The erection of a building;
b) The carrying out of work in, on, over or under land;
c) The use of land or of a building or work; and
d) The subdivision of land, and includes any act, matter or thing for which provision may be made under Section 26 of the Environmental Planning and Assessment (EP&A) Act and which is prescribed for the purpose of this definition, but does not include:

- any act, matter or thing for which development consent under Part IV of the EP&A Act is required or has been obtained;
- Or any act, matter or thing which is prohibited under any environmental planning instrument.

Approval

A licence, permission or any authorisation under the EP&A Act 1979.

Approving Authority

A Council, authority or determining body.

Authority

In relation to a development application, means:

a) The Council having the function to determine the application and/ or regulate the activity; or
b) The Minister or public authority or the Director where an environmental planning instrument specifies as having the function to determine the application.

Building Works

Includes building/structure or part thereof.

Consent

Means a licence or permission or any authorisation under the EP&A Act 1979.

Construction Site or Area of Disturbance

Is that portion of a site disturbed by the development and/or building and includes the areas where building materials are placed and access traversed by vehicles.

Cultivation

The mechanical preparation of the soil required for the growing of crops/pasture.

Development

in relation to land, means; the erection of a building on that land; the carrying out of a work in, on, over or under that land; the use of that land or of a building or work on that land; the subdivision of that land.

Dispersible Soil

Dispersible soil is soil which is structurally unstable. In water it will break down into its

constituent particles (clay, silt and sand). Highly dispersible soils are highly erodible and are associated with high exchangeable sodium and low soluble salt concentrations. In the absence of better defining criteria, soils that contain > 10% dispersible material can disperse and need flocculation. Soil dispersability can be determined by laboratory tests.

Earth Bank and Channel
A bank is a ridge or embankment of compacted earth. A channel is an excavated earth drainage ditch or path used to intercept and direct runoff to a desired location.

Erosion and Sediment Control Plan (ESCP)
Is a plan showing how potential erosion and sedimentation on a given site resulting from approved building works, development or activity will be minimised or controlled.

Erosion and Sediment Control Strategy (ESCS)
Is a staged plan showing how potential erosion and sedimentation on a given site (which is proposed to be developed over an extended period of time or via staged development works), resulting from approved building works, development or activity will be minimised or controlled.

Environmentally Sensitive Land
Is land that is located within 100m of a water course, is steeper than 20 degrees of slope; liable to degradation due to erosion, sedimentation, salinity/acidity, inundation by sand/soil or water, invasion by exotic vegetation; or native vegetation and wetlands.

Landscape Plan
Is a plan showing the location, type and quantity of vegetation and structural elements to be placed on the site to gain visual amenity and screen sections of the site from public view or use.

Level Spreader
An excavated outlet constructed at zero grade and level across the outlet edge.

Perimeter Banks and Channels
Are earthen structures that collect and divert runoff and have a level spreader (level sill) outlet to prevent erosion at the discharge point.

Receiving Waters
Means either:

a) natural water bodies, including rivers, streams (perennial or intermittent), flowing in natural channels with natural beds or in artificially modified channels, lakes, lagoons or wetlands, either naturally formed or artificially modified, or tidal waters, including bays, estuaries or inlets, or
b) constructed water bodies including waterways, channels, canals, dams, ponds, or wetlands, lakes, bays or inlets no matter whether they are permanently or intermittently inundated with water.

Sediment
Means either mineral or organic material that is being, or has been moved from its site of origin by transporting agents such as water, wind and gravity to a lower position in the

catchment.

Sedimentation
Means the deposition of sediment, usually in locations such as a channel, along a fence, in an area of low slope or a sediment trap, dam or water body.

Soil Erosion
Means the wearing away of the soil surface by wind, water or gravitational effects. Natural rates of erosion are accelerated by some human activities.

Soil and Water Management Plan
describes the planned measures to be undertaken at an activity site which will mitigate soil transport and control pollution by sediment or nutrient to downslope lands and receiving waters.

Subdivision
"Subdivision", "subdivide", and similar expressions refer to dividing land into parts.

Vegetation
Means native and exotic trees, shrubs, understorey and grasses found within the Council area.

Waters
means any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), or part thereof, and includes water stored in water mains, water pipes and water channels, and any underground or artesian water, or any part thereof.

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