

Session 4

Planning Your Project

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Plan Preparation

- What sort of plan do I require?
- Plan may comprise:
 - Drawing(s) to show layout of works
 - Commentary as annotated sketches or report
- If disturbed area is $>250\text{m}^2$ and $<2,500\text{m}^2$ require an ESCP
- If disturbed area is $>2,500\text{m}^2$ may require a more detailed SWMP

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Examples

- Disturbed area $<250\text{m}^2$: house extension, garage, small driveway
- Disturbed area $250\text{-}2,500\text{m}^2$: most new dwellings, commercial developments, small subdivisions, medium/high density housing, small civil works
- Disturbed area $>2,500\text{m}^2$: large subdivisions, large medium/high density housing, road construction and large civil works

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ESCP or SWMP?

- Chapter 2 of the Blue Book describes the difference between an ESCP and a SWMP
- ESCP:
 - Site plan to show Best Management Practices (BMPs)
 - Standard Drawings from Blue Book
- SWMP, in addition, requires:
 - Supporting calculations for sediment basins and structures (in Report)
 - Details of erosion and sediment controls
 - Inspection and maintenance notes
 - Stabilisation requirements

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ESCP

Typical measures include:

- Clean water diversion
- Access controls (barrier fence)
- Stabilised access
- Sediment fence
- Designated stockpile locations
- Waste disposal facilities/storage

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What are we trying to avoid?



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Clean water diversion

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This photograph shows a clean water diversion system. A long line of sandbags is placed along the edge of a road, with a white tarp laid over them to divert water away from the road surface. A red and yellow safety barrier is visible in the foreground.

Access controls/barrier fence

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This photograph shows a barrier fence made of chain-link fencing supported by wooden posts. A gate is visible in the distance. The fence is set up along a paved area, likely to restrict access to a site.

Stabilised access

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This photograph shows a stabilised access point. A concrete pad is placed over a gravel base to provide a stable surface for vehicles. A technical diagram to the right shows a cross-section of the structure, including labels for 'Stabilised area', 'Gravel base', 'Concrete pad', and 'Sediment fence'. The diagram also includes a list of materials and dimensions.

Sediment fence

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This photograph shows a sediment fence, which is a series of parallel concrete or metal pipes driven into the ground. A technical diagram to the right shows a cross-section of the fence, including labels for 'Sediment fence', 'Gravel base', and 'Sediment trap'. The diagram also includes a list of materials and dimensions.

Stockpiles

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This photograph shows a stockpile of material, likely gravel or sand, with a technical diagram to the right. The diagram shows a cross-section of the stockpile, including labels for 'Earth bank', 'Sediment trap', and 'Sediment fence'. The diagram also includes a list of materials and dimensions.

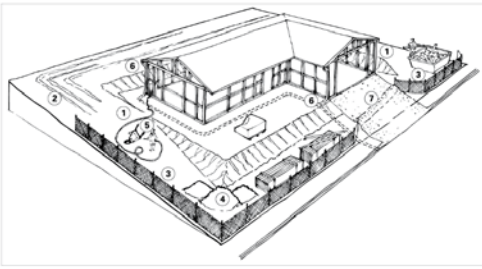
Waste storage

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This photograph shows waste storage containers, including a green bin and a brown bin, with a wooden pallet in front of them. The bins are located near a building.

Basic ESC measures for single lot development



Erosion and sediment control measures: 1 minimise disturbance, 2 diversion devices, 3 sediment barriers, 4 secure stockpiles, 5 other containments, 6 early stormwater connection, 7 controlled access point.

Source: www.yourhome.gov.au

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SWMP

- Applies same principles as ESCP
- For larger projects with:
 - Greater areas of disturbance
 - Higher pollution risk



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SWMP

- Is the area of disturbance >2,500m²?
- Undertake constraints analysis
- Waterfront/riparian land or flood prone?
- Complete erosion hazard assessment
- Run RUSLE and determine Soil Loss Class
- Consider timing restrictions
- Batter limitations required?
- Sediment basin test
- Determine appropriate type of basin (if required)
- Prepare SWMP to include erosion and sediment controls, maintenance notes, stabilisation requirements and BB Standard Drawings

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Assessment of Constraints

- Blue Book Reference Chapter 3


Consider:

- Waterfront (riparian land): vegetated land adjacent to waterbodies
- Flooding: <2 year ARI flood level, automatically considered Soil Loss Class 6 – high erosion hazard
- Need to focus on erosion control

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Riparian and flood prone land

- What are the ESC implications for riparian and flood prone land?



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Groundwater

- How can groundwater affect ESC?
 - Flow into bores, wells and open excavations
 - Collapse of excavations
 - Site access
 - Perched watertables
 - Moisture fluctuations
 - Seasonal and permanent watertables
 - Implications for plant growth and stabilisation

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Salinity

- How can salinity affect ESC?
 - Implications for plant growth
 - Reduction in C-factor and consequent increase in erosion hazard
 - Blue Book Reference Appendix C lists constraints in various Soil Landscapes throughout NSW

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Acid sulfate soils

- How can acid sulfate soils affect ESC?
 - Acid Sulfate Soil Risk Map
 - Common in coastal NSW
 - Excavations in and near coast and estuaries
 - Procedures for handling and pH stabilisation

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Soil Landscape Descriptions

Links soils to landscape by key features:

- Geology/rock type
- Soil type
- Position on slope
- Landforms
- Blue Book Reference Appendix C

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Potential Limitations Soils

High variability in soils across NSW:

- Soils range from sands to clays, various levels of stoniness, varying depths
- Typically poor soil fertility and low pH
- Constraints such as waterlogging, shrink/swell cracking, sodicity and dispersibility common
- Often moderate to high erosion hazard, particularly subsoils

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Soil Landscape Mapping

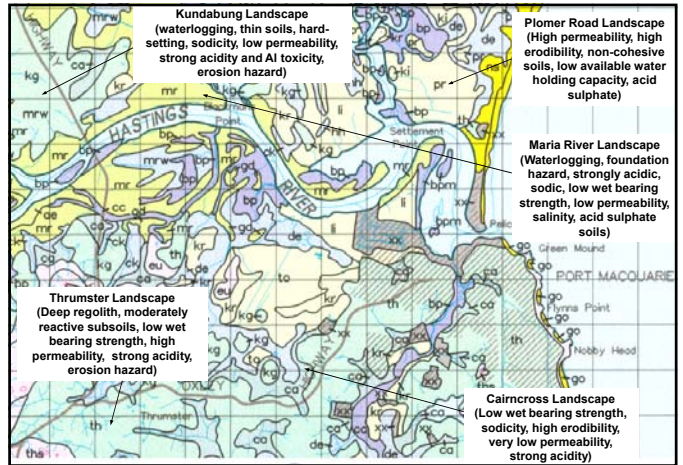
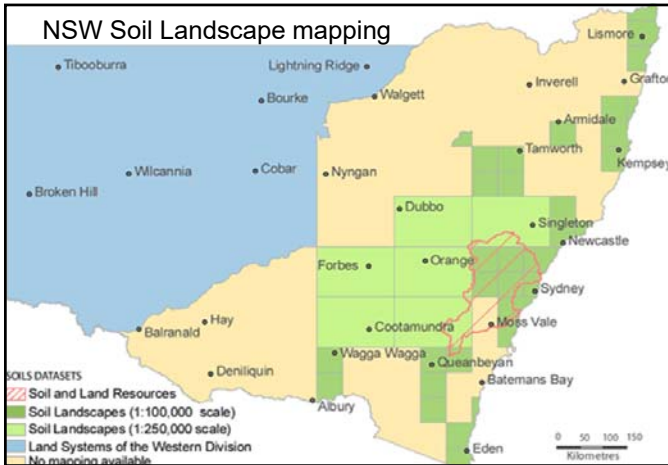
NSW Soil Landscape Maps (OEH)

- 1:100,000 – 1:250,000 scale
- Detailed information in companion books
- Available at shop.nsw.gov.au

SPADE in NSW NR atlas

- Electronic data, including borelogs
- <http://www.environment.nsw.gov.au/eSpade2Webapp>

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SALIS Soil Profile data

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Soil Essentials Report

Site Location: MGA Grid Reference: Easting 341754, Northing 620706 GOSFORD (8131) 1:100,000 sheet

Profile Details: Soil Landscapes of the Coastland 1:100,000 Sheet Survey, Profile 316, collected by Casey Skyles on May 08, 1993

Physiography: Located on the hills under dry sclerophyll forest on sandstone quartz (thin) and used for vetch-rhizome pasture. Slope 4% (estimated), elevation 155 m, aspect south-east, profile is rapidly drained, erosion hazard is high, and no salting evident

Soil Type: Fragile Hummocky Aeric Podsol (ASC), Podsol (GSD), U42.32 (PFF)

Soil Description

Layer 0
 Sandy sand with single granule (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident. Segregations are not evident, not evident, always (<5 mm) boundary to:

Layer 1
 sand with massive structure (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident. Segregations are not evident, not evident, not evident, always (<5 mm) boundary to:

Layer 2
 sandy sand with massive structure (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident. Segregations are not evident, not evident, not evident, always (<5 mm) boundary to:

Layer 3
 sandy sand with massive structure (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident. Segregations are not evident, not evident, not evident, always (<5 mm) boundary to:

Laboratory Test Date

Upper	Lower	%	UCSC	Ph	EC	OC	Ray	P	Soil	Each	Each	Each	Each	Na
Bound	Bound									Al	Ca	Mg	Na	

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Management Options?

- Where identified, suitable revegetation topsoils must be separated and preserved for later use
- Minimise exposure of sodic subsoils
- If excavation necessary, segregate sodic soils from other materials and treat/store appropriately to manage dispersion
- Treat sodic soils with gypsum or other stabilisers

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Potential Limitations Regional Climate

Variability across NSW (E-W & N-S):

- Predictable rainfall patterns over the long term record (changing?)
- El Nino Southern Oscillation (e.g. La Nina 2010)
- Wet summers or wet winters
- High variability in evaporation rates (spatially and temporally) from open water and soil surfaces
- Soil cover and permeability commonly limiting to soakage = runoff

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Rainfall Erosivity (R-factor)

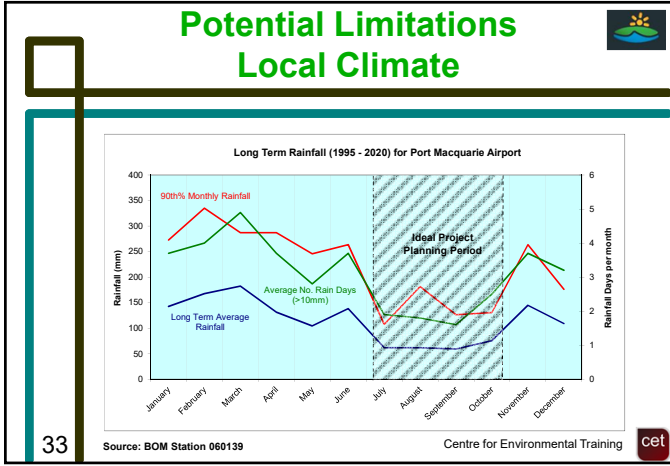
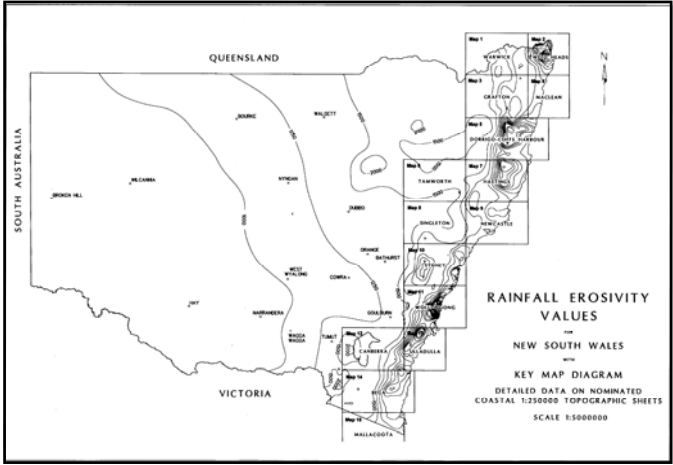
- A measure of the ability of rainfall to cause erosion
- Related to the energy and intensity of rainfall
- Varies throughout Australia and throughout the year
- Range in NSW 250-10,000

R = 4,000-4,500 (Annual for Port Macquarie)

R-Factor

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Courtesy: Landcom (2004) Centre for Environmental Training cet

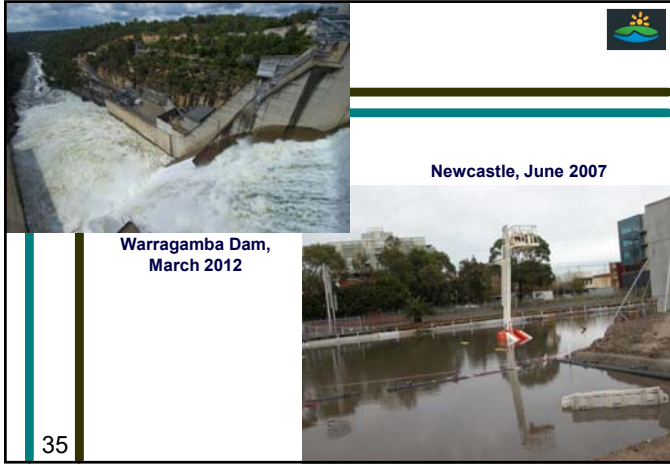


Potential Limitations Site Hydrology

- Urban stormwater systems
- Flood dynamics variable (spatially and temporally)
- Runoff close to 100% on impervious surfaces (urban); low time of concentration
- Drainage on and around your construction site – where will the water go?

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Other Potential Conflicts

- **Physical Assets**
 - access tracks, local roads, rail corridors, utilities, bridges etc.
- **Natural Assets**
 - Surface waters, catchment areas, groundwater, wetlands, cultural heritage areas, sensitive species and habitats

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Potential Conflicts

Water and Sewer Assets

- Water storages / reservoirs
- Water treatment plants
- Wastewater treatment plants
- Sewer mains
- Pump stations
- stormwater pipe, culverts and detention / treatment facilities

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Other Potential Conflicts

Infrastructure Assets

- Main and local roads
- Paths and cycle ways
- Kerb and gutter
- Bridges and culverts

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Endangered List NSW

Level of Threat:

- **Vulnerable** “likely to become endangered unless the circumstances and factors threatening its survival or evolutionary development cease to operate”
- **Endangered** “likely to become extinct or is in immediate danger of extinction”
- **Critically Endangered** (even more likely/sooner)

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Endangered List – Mid Coast

Species

- 48 terrestrial plants, 65 birds, 8 reptiles, 9 amphibians, 12 marsupials, 13 bats, 3 invertebrates, 2 rodents, 5 marine mammals, 4 aquatic plants

Protected Areas

- National Park and State Forest - ~166,000ha
- ~45% of LGA

Ecological Communities

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Management Options?

- Program critical works during times of ‘low probability’ for extreme rainfall conditions
- Store problematic materials (dispersive/sodic soils) well away from potential areas of inundation
- Maintain maximum surface cover (natural or installed) of exposed areas
- Minimise the use of temporary stream crossings (greenfield sites)

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