## Site Inspection and Management of Erosion and Sediment Control Measures

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## Inspection

- Inspection is a routine part of ensuring ongoing compliance
- Inspection of all erosion and sediment control measures should be undertaken both on a routine (periodic) basis and after any significant rainfall event

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## Required Standards

- Compliance with the required standards including management plans and the Blue Book
- Ensuring compliance of erosion and sediment management controls during construction
- Particularly when significant land disturbance is underway at sites adjacent to sensitive and/or residential receivers

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## Blue Book Guidance

- Limited guidance on inspection provided in the Blue Book
- Inspection and Test Plan, Figures 2.1a and 2.1b, outlines inspection activities and acceptable criteria and responsibilities of Subcontractors, Contractors and Superintendent through entire process from development of an ESCP to project completion; but is intended for residential development on sites <2,500m$^2$, so is not ideally suited to other types of construction works

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## IECA Manual Guidance on Site Inspection

- IECA Best Practice Erosion and Sediment Control manual, Book 1, Chapter 7, covers site inspection in detail
- Outlines best practice
- From the perspective of:
  - Project Manager, Site Supervisor
  - Engineering/Environmental Consultant
  - Regulator

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## Purpose of Site Inspection

- Determine if site activities are compliant
- If adopted plan is still appropriate
- Controls are being properly implemented
- Controls comply with relevant standards
- Controls are properly maintained
- Determine if works are contributing to or have potential to cause environmental harm
- Determine if amended plan is required

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## Monitoring and Maintenance Plan

- For sites with >2,500m$^2$ disturbed area
- Understand the local environmental values potentially at risk
- Have assessed the risk to determine if the measures in place are commensurate with the risk and site complexity
- Have sound working knowledge of applicable BMPs and their correct installation, operation and maintenance



## Measures Commensurate with Risk?




## Prior to Inspection

- Familiarise with legislative requirements
- Understand principles and practices of E&SC with respect to the site
- Understand expected weather conditions whilst ground is disturbed
- Understand the local soils
- Understand the receiving environments and their sensitivity
- Review approved plans and proposed measures
- Review compliance history



## Inspection

- Do measures in place minimise safety risks?
- Is it safe to undertake an inspection?
- Have measures been inspected by responsible staff in the past week (or 24 hours if rain expected or occurring) and records kept?
- Are daily/weekly inspections sufficiently rigorous?
- In addition, on longer jobs, monthly inspections should check cover adequacy, rehabilitation and future staging



## Water Quality Monitoring

- Sample at each point of concentrated discharge during rain event
- Monitor upstream and down stream for comparison
- Recommend testing at NATA lab if possible
- Monitor for appropriate parameters:
  - Suspended solids
  - Turbidity (TSS and turbidity do not readily correlate)
  - pH
  - Dissolved oxygen
  - Oil and grease
  - Litter



## Bear in Mind

- Are all measures according to the approved plans?
- Are all measures in working order?
- Is the site suitably prepared for rainfall events?
- Will amendments to the ESCP or SWMP be required?

## Review Drainage Controls

- Address rill erosion with additional drainage controls or cover
- Ensure measures prevent contamination of "clean" water
- Ensure measures do not exacerbate flooding on adjoining property

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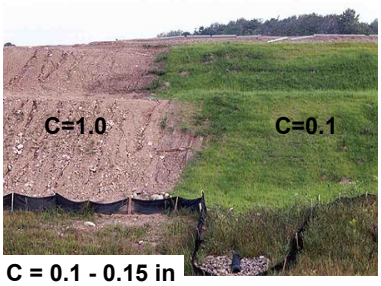
## Review Erosion Controls




**Target C = 0.1 - 0.15 in 20 working days**

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## Review Erosion Controls

- Ensure measures in place achieve and maintain adequate ground cover
- Ensure measures are not likely to be washed or blown away from intended location



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## Review Sediment Controls

- Ensure sediment controls allow ponding and settlement
- Ensure traps are not bypassed by sediment-laden water
- Ensure sediment fences do not allow flow along or around the fence
- Ensure sediment is being removed to reinstate capacity
- Ensure water in sediment basins is being appropriately captured and treated before release
- Ensure non-storm related water; wash water, dewatering water etc. is appropriately captured and treated

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## Sediment Controls




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## Tables in IECA manual

- Critical E&SC measures for specific soils
- Critical E&SC measures for specific topographic conditions
- Critical E&SC measures for various drainage conditions
- Critical E&SC measures for various receiving waters
- Critical E&SC measures for various weather conditions

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## IECA Manual Proformas/Checklists

- Inspection and Test Plan
- Non-conformance Report
- Weekly Site Inspection
- Site Inspection Checklists for various aspects of sites and measures. These detail specific aspects of sites, vegetation, soils, materials, waste, drainage, erosion controls, sediment controls, instream works and stabilisation



## Large Scale Developments

For example for coal mines:

- Often relatively long term
- Typically have approved plan
- Quality and effectiveness of plans variable
- Plans often conceptual and may be less well suited to on-the-ground application
- Plans may not capture construction stages well



## Moolarben Example



## Issues?

- Height of stockpiles
- Exposure to wind
- Break of slope
- Rilling
- Surface compaction/cover
- Flow velocity between stockpiles
- Check dams
- Sediment accumulation



## Possible Solutions

- Maintain low stockpile height
- Minimise exposure to wind
- Round off and compact at break of slope
- Keep batter gradients < 2:1, compact, cover
- Binders, mulch, rock cover
- Minimise flow velocity with check dams
- Maintain by clearing sediment from behind check dams



## Moolarben Example

## What are the Issues?

- Sediment fence running down gradient
- Guides/contains water to create channel flow
- No returns to slow flow along line of fence
- Velocity enough to trigger rilling
- Consequent erosion and sedimentation

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## Possible Solutions

- Place sediment fence on contour
- Find alternative on steep slopes (catch drain and check dams to sediment basin)
- Construct returns to impede/slow flow along line of sediment fence
- Maintain sediment fence and clear sediment from behind check dams and basins

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## Moolarben Example

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## What are the Issues?

- Erosion from cleared drill site
- Over-reliance on sediment fence
- Sediment fence overloaded, collapsing under weight of sediment
- Accumulated sediment build up not cleared
- What are the straw bales doing?

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## Possible Solutions

- Divert run-on water around drill site
- Cover cleared area to reduce erosion (gravel/rock)
- Maintain sediment fence by periodic clearing of accumulated sediment
- Maintain vegetation in front of and behind sediment fence
- Consider a second line of sediment fence
- Consider diverting stormwater to temporary basin (use straw bales and pickets)

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