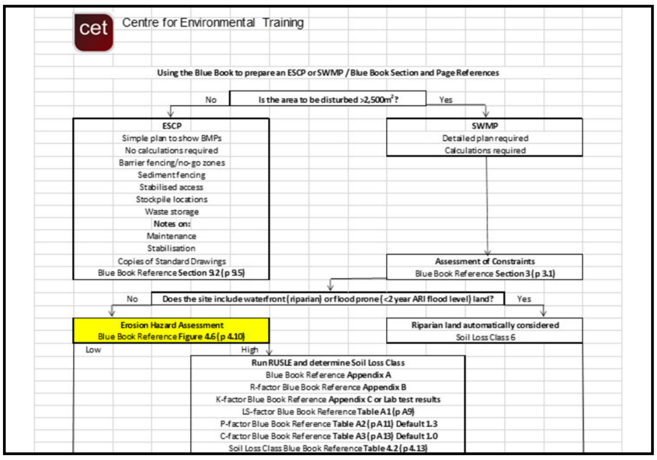
Quantifying Erosion Risk using RUSLE

1

Centre for Environmental Training



Assessment of erosion hazard

Blue Book Reference Chapter 4, Section 4.4

- Preliminary assessment of potential erosion hazard (A-line test)
- Special requirements for high erosion hazard land (Section 4.4.2):
  - Batter gradient restrictions Figures 4.7, 4.8
  - Timing of works (low rainfall intensity periods) Table 4.3, Figure 4.9
  - Stabilisation restrictions, C-factors >0.1 only when 3-day forecast suggests rain unlikely

3

Centre for Environmental Training

Measured erosion rates

Natural conditions:	(t/ha/yr)
• Forest	0.005 – 0.05
• Grassland	0.1 – 1.0
Human Activity:	
• Grazing land	0.1 – 5.0
• Developed Residential	5 – 10
• Active Construction sites	60 – 100+

4

Centre for Environmental Training

Measured erosion rates

By how many fold do we increase erosion rates by undertaking construction on land that was previously grassland?

Natural conditions:	(t/ha/yr)
• Grassland	0.1 – 1.0
• Active Construction sites	60 – 100+

5

Centre for Environmental Training

Measured erosion rates

By how many fold do we increase erosion rates by undertaking construction on land that was previously grassland?

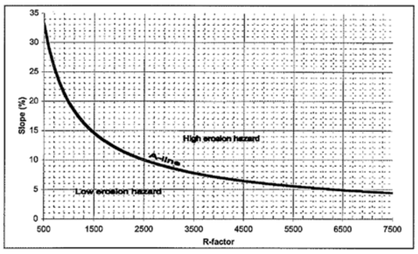
- Between 60 and 1,000 fold!

6

Centre for Environmental Training

Erosion hazard assessment

- Blue Book Reference Figure 4.6 (page 4-10)

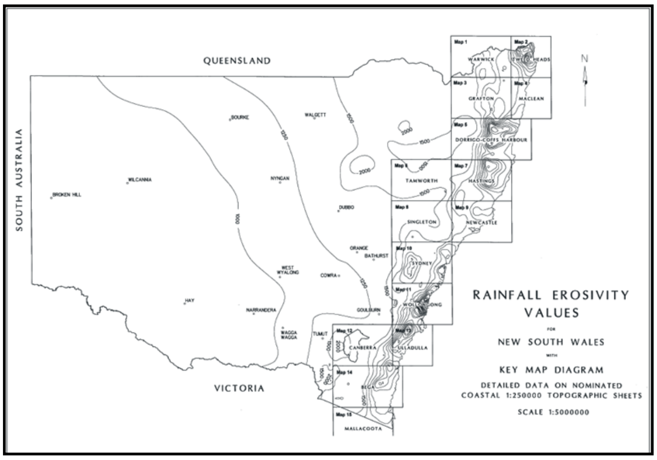


7 Centre for Environmental Training cet

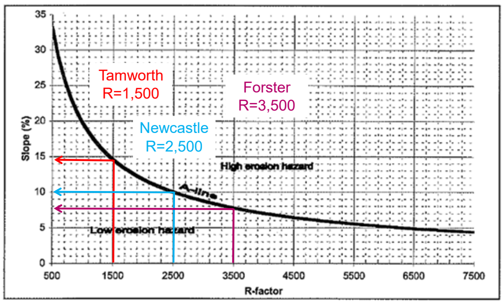
Erosion hazard assessment

- Relates erosion hazard to Slope and Rainfall Erosivity
- Blue Book Reference Appendix B for R-factor maps
- What slope gradient would define land as high erosion hazard in Tamworth?
- Newcastle?
- Forster?

8 Centre for Environmental Training cet



A-line test



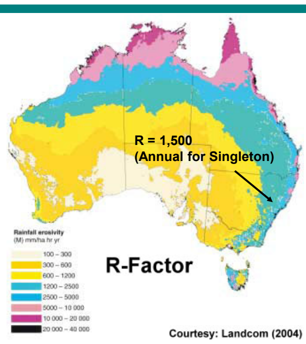
10 Centre for Environmental Training cet

Erosion hazard assessment

- If you were planning to duplicate the width of an unsealed road and upgrade box culverts at a creek crossing at Singleton, where the slope was 13%, what would the erosion hazard be?

11 Centre for Environmental Training cet

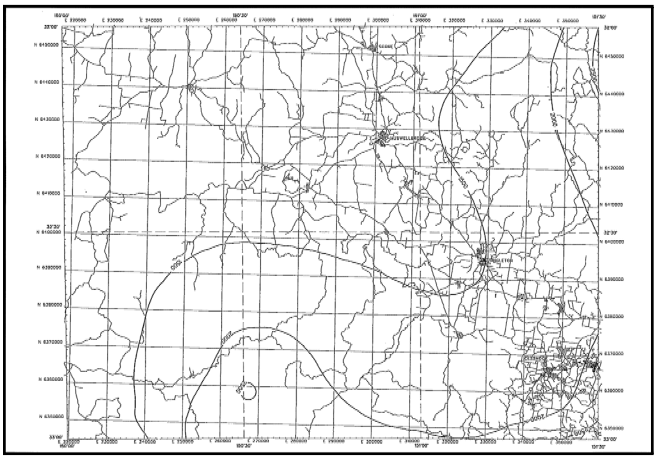
Rainfall Erosivity (R)



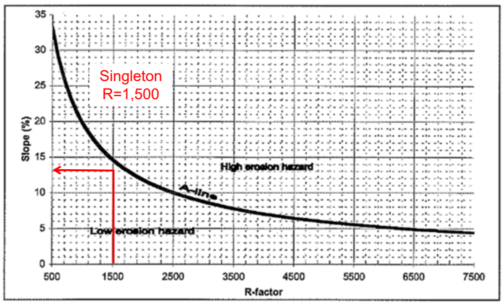
Courtesy: Landcom (2004)

- 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
- BB Ref Appendix B for R-factor maps

12 Centre for Environmental Training cet



A-line test



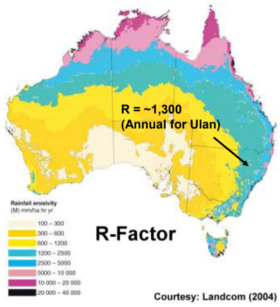
14 Centre for Environmental Training cet

Erosion hazard assessment

- At what gradient do works become “high hazard” at Moolarben?
- In such circumstances, how might you reduce the risk?

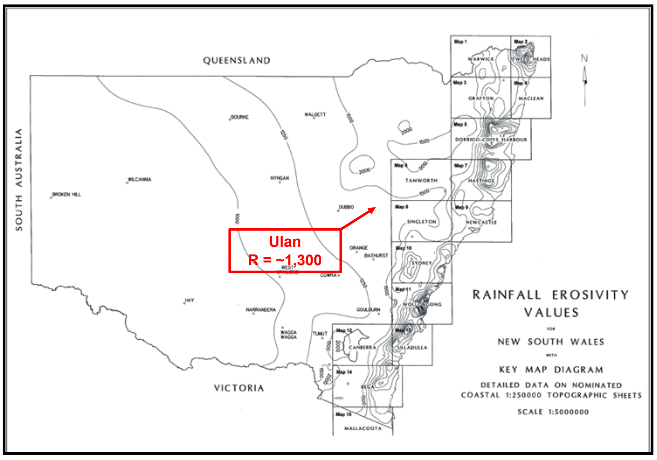
15 Centre for Environmental Training cet

Rainfall Erosivity (R)

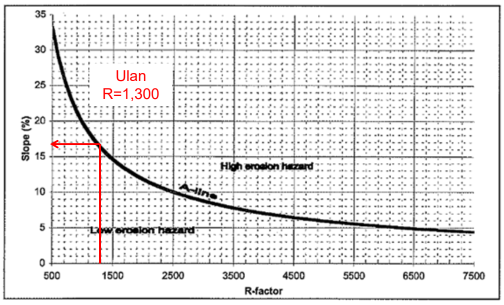


- A measure of the ability of rainfall to cause erosion
- Related to the energy and intensity of rainfall
- Varies throughout Australia and throughout the year
- BB Ref Appendix B for R-factor maps

16 Centre for Environmental Training cet



A-line test for Ulan



18 Centre for Environmental Training cet

Erosion hazard

Standard erosion controls apply to all sites:

- Stabilised access (SD 6-14)
- Water management (BB Ref Chapter 5)
- Stockpile management (SD 4-1, p4-5)
- Stabilisation requirements (BB Ref Chapter 7)

High erosion hazard sites also require:

- Timing of works (Table 4.3)
- If not possible, C-factor >0.1 (60% cover) only when 3-day forecast suggests rain is unlikely
- Management of batter gradients (Fig 4.7, 4.8)

19 Centre for Environmental Training cet

Assessing erosion hazard

Erosion hazard is the susceptibility or risk of land to erosion

- Depends on a combination of factors
- Varies from site to site

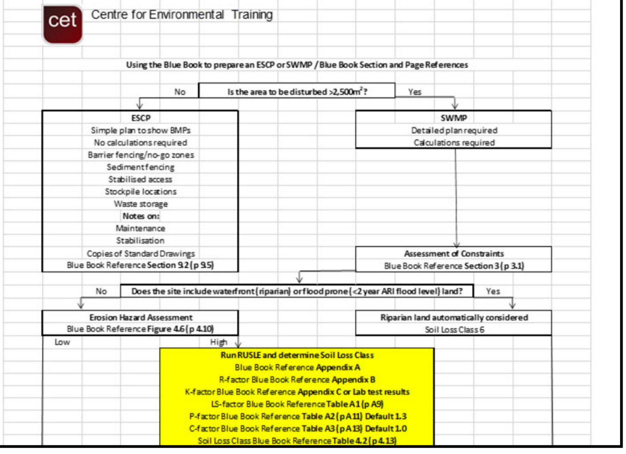
20 Centre for Environmental Training cet

Erosion factors

The following factors are significant:

- **Rainfall** erosivity / intensity
- **Soil** type and erodibility
- **Slope** length/steepness
- **Conservation practice**
- **Cover** type

21 Centre for Environmental Training cet



RUSLE

- Factors influencing erosion form the basis for the **R**evised **U**niversal **S**oil **L**oss **E**quation
  - Empirical equation used to estimate erosion hazard for a location
  - How much soil is likely to be lost from a site?
  - What factors influence the amount of erosion?

23 Centre for Environmental Training cet

RUSLE

- Equation:

$$A = R \times K \times LS \times P \times C$$

Where:

- A = Computed soil loss (tonnes/ha/year)
- R = rainfall erosivity factor
- K = soil erodibility factor
- LS = slope length / gradient factor
- P = erosion control practice factor
- C = ground cover and management factor

24 Centre for Environmental Training cet

RUSLE

- Equation:

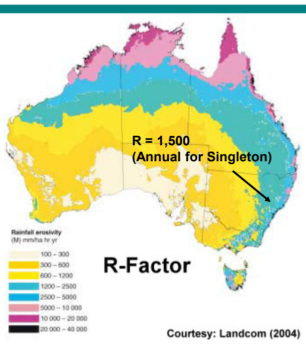
  A = R x K x LS x P x C

- If any one factor increases, A (computed soil loss) increases
- Equally, if any one factor decreases, A decreases
- Important to determine the relative influence of the factors

RUSLE

- Blue Book Reference Appendix A
- Use to assess erosion hazard
- Use to estimate Soil Loss Class
- Use in sediment basin design
- Note that RUSLE only applies to non-channelised erosion (i.e. not concentrated flows)
- Also, RUSLE does not consider dispersibility
- RUSLE is a major element of the Blue Book approach

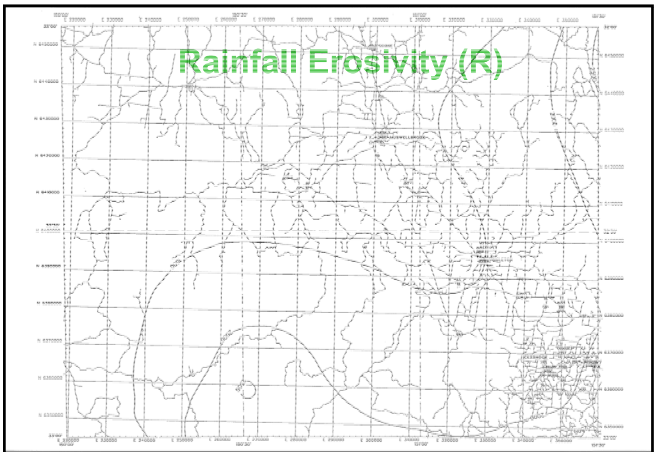
Rainfall Erosivity (R)



Courtesy: Landcom (2004)

- 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
- BB Ref Appendix B for R-factor maps

Rainfall Erosivity (R)



Rainfall Erosivity (R)

- Predominant rainfall droplet size (energy)
- Based on average annual rainfall data
- Ignores prevailing soil moisture
- $R = 164.74 \times 1.1177^{S} \times S^{0.6444}$, where
  - S is the 2-year, 6-hour storm event
- Calculated for Singleton using the new Intensity-Frequency-Duration (IFD) data

  R = 1,257

Rainfall Erosivity (R-factor)

- Does not account for seasonality or antecedent conditions affecting peak flow and total runoff
- If a seasonal rainfall pattern is evident work on land with a high erosion hazard should be undertaken in the “drier” months

Rainfall Erosivity (R-factor)

SINGLETON ARMY	61275											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	94.3	88.9	72.7	58.4	59.7	37.9	28.2	37.1	45.3	69.1	68.5	63

Which months would you choose to work in Singleton?

31 Centre for Environmental Training cet

Soil type and Erodibility (K)

- A measure of the susceptibility of soil particles to erosion
- Affected by soil texture, structure, organic matter, profile permeability and other parameters
- Generally, fine sands and silts are most erodible, but dispersible clays can be highly erodible
- BB Ref Appendix C or Lab test results

32 Centre for Environmental Training cet

Soil texture

- Coarse sand 0.2 – 2.0 mm
- Fine sand 0.1 – 0.2 mm
- Very fine sand 0.02 – 0.1 mm
- Silt 0.002 – 0.02 mm
- Clay < 0.002 mm

33 Centre for Environmental Training cet

Soil organic matter

- % Organic carbon x 1.72
- Based on laboratory analysis

34 Centre for Environmental Training cet

Soil structure

- Very fine granular - particles mostly < 1mm diameter
- Fine granular – particles mostly 1 - 2 mm diameter
- Medium or coarse granular – particles mostly 2 – 10 mm diameter
- Blocky, platy or massive

35 Centre for Environmental Training cet

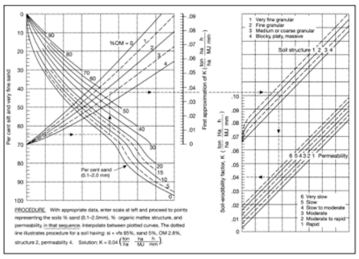
Soil profile permeability

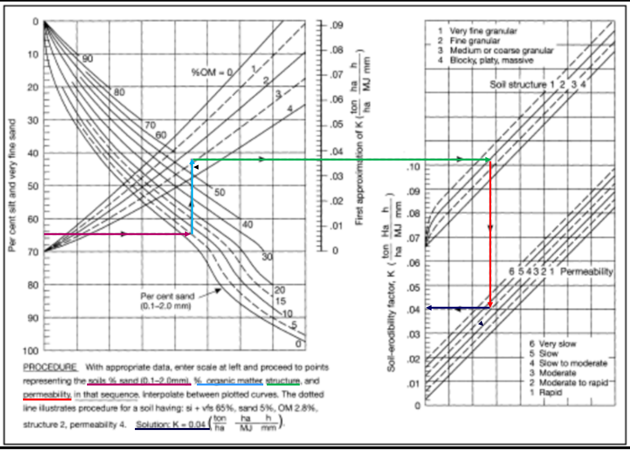
- The rate of infiltration of water (K_{sat}) into the whole soil profile
- Rapid >130 mm/hour
- Moderate to rapid 60 - 130 mm/hour
- Moderate 20 - 60 mm/hour
- Slow to moderate 5 - 20 mm/hour
- Slow 1 - 5 mm/hour
- Very slow <1 mm/hour

36 Centre for Environmental Training cet

Soil Erodibility K-factor nomogram

- Blue Book Reference Figure A3 (page A7)





K-factors (after Rosewell 1993)

Table E4 – Default soil erodibility K-factors based on soil texture class

Soil texture	Symbol	Estimated clay content (%)	K-factor [1]
Sand	S	< 10	0.015
Clayey sand	CLS	5–10	0.025
Loamy sand	LS	5–10	0.020
Sandy loam	SL	10–15	0.030
Fine sandy loam	FSL	10–20	0.035
Sandy clay loam	SCL	15–20	0.025
Loam	L	about 25	0.040
Loam, fine sandy	Lfsy	about 25	0.050
Silt loam	SiL	about 25 and more than 25% silt	0.055
Sandy clay loam	SCL	20–30	[0.043]
Clay loam	CL	30–35	0.030
Silty clay loam	SiCL	30–35 and more than 25% silt	0.040
Fine sandy clay loam	FSCL	30–35	0.025
Sandy clay	SC	35–40	0.017
Silty clay	SiC	35–40 and more than 25% silt	0.025
Light clay	LC	35–40	0.025
Light medium clay	LMC	40–45	0.018
Medium clay	MC	45–55	0.015
Heavy clay	HC	> 50	0.012

Soil type and Erodibility (K-factor)

- K-factor is least accurate component of RUSLE
- Much data based on topsoils, yet subsoils are generally of more significance in construction
- Increase by 20% for dispersive soils (Emerson Class 1 and 2)

Soil type and Erodibility (K-factor)

- Soil is 600mm of silty clay loam topsoil
- Overlying light-medium clay

What is the K-factor of the topsoil?

0.040

How would the K-factor change if the subsoil was exposed?

0.018

Soil type and Erodibility (K-factor)

What is the implication of this for the A value (calculated soil loss)?

If you were working on a site with these soils what might be a good course of action to reduce erosion hazard?

Moolarben Coal
Practical Erosion and Sediment Control Training
18 September 2025

Slope Length / Steepness (LS)

- A measure of the combined effect of slope length and gradient on soil loss
- Increases as slopes get steeper and longer
- Gradient has greater influence
- Blue Book Reference Appendix A, Section A4
- If >1,000m² is to be disturbed, Table A1 assumes slope lengths do not exceed 80 metres before forecast rainfall or during shutdown periods (i.e. 80 metres is default)

43 Centre for Environmental Training

LS-factor (Table A1)

Table A1 LS-factors on construction sites using the RUSLE

Slope ratio	Slope gradient (%)	Slope length (m)														
		5	10	20	30	40	50	60	70	80	90	100	150	200	250	300
100:1	1	0.09	0.11	0.13	0.15	0.16	0.17	0.18	0.19	0.19	0.20	0.20	0.23	0.24	0.26	0.27
50:1	2	0.14	0.18	0.24	0.28	0.31	0.34	0.36	0.39	0.41	0.43	0.44	0.52	0.58	0.64	0.69
33.3:1	3	0.17	0.24	0.34	0.41	0.47	0.52	0.57	0.61	0.65	0.69	0.72	0.87	1.00	1.11	1.22
25:1	4	0.21	0.30	0.44	0.54	0.63	0.71	0.78	0.85	0.91	0.97	1.03	1.26	1.47	1.65	1.82
20:1	5	0.24	0.36	0.54	0.68	0.80	0.91	1.01	1.10	1.19	1.27	1.35	1.70	2.00	2.28	2.53
16.6:1	6	0.28	0.42	0.64	0.81	0.97	1.11	1.24	1.36	1.47	1.58	1.68	2.14	2.54	2.91	3.25
12.5:1	8	0.34	0.53	0.83	1.08	1.31	1.51	1.70	1.88	2.05	2.21	2.37	3.07	3.70	4.28	4.82
10:1	10	0.42	0.68	1.09	1.44	1.75	2.04	2.31	2.56	2.81	3.04	3.27	4.06	4.94	5.75	6.52
8.3:1	12	0.52	0.85	1.39	1.85	2.27	2.66	3.02	3.37	3.70	4.02	4.33	5.77	7.07	8.28	9.42
7.1:1	14	0.62	1.02	1.69	2.26	2.79	3.28	3.74	4.18	4.61	5.02	5.42	7.27	8.95	10.52	12.01
6.3:1	16	0.71	1.19	1.98	2.67	3.31	3.90	4.46	5.00	5.52	6.02	6.51	8.78	10.86	12.81	14.65
5.5:1	18	0.80	1.35	2.27	3.07	3.82	4.51	5.17	5.81	6.42	7.02	7.59	10.30	12.78		
5:1	20	0.89	1.50	2.55	3.47	4.32	5.12	5.88	6.61	7.32	8.01	8.68	11.92	14.84		
4:1	25	1.09	1.88	3.23	4.43	5.54	6.59	7.60	8.57	9.51	10.43	11.32				
3.3:1	30	1.28	2.23	3.86	5.32	6.69	7.99	9.23	10.43	11.60	12.74	13.85				
2.5:1	40	1.61	2.83	4.98	6.92	8.74	10.48	12.15	13.77							
2:1	50	1.88	3.33	5.89	8.22	10.42	12.52	14.55								

44 Centre for Environmental Training

Slope Length / Steepness (LS)

- Assume slope is 3% and slope length is 100 metres
- Calculate the LS-factor?

45 Centre for Environmental Training

LS-factor

Table A1 LS-factors on construction sites using the RUSLE

Slope ratio	Slope gradient (%)	Slope length (m)														
		5	10	20	30	40	50	60	70	80	90	100	150	200	250	300
100:1	1	0.09	0.11	0.13	0.15	0.16	0.17	0.18	0.19	0.19	0.20	0.20	0.23	0.24	0.26	0.27
50:1	2	0.14	0.18	0.24	0.28	0.31	0.34	0.36	0.39	0.41	0.43	0.44	0.52	0.58	0.64	0.69
33.3:1	3	0.17	0.24	0.34	0.41	0.47	0.52	0.57	0.61	0.65	0.69	0.72	0.87	1.00	1.11	1.22
25:1	4	0.21	0.30	0.44	0.54	0.63	0.71	0.78	0.85	0.91	0.97	1.03	1.26	1.47	1.65	1.82
20:1	5	0.24	0.36	0.54	0.68	0.80	0.91	1.01	1.10	1.19	1.27	1.35	1.70	2.00	2.28	2.53
16.6:1	6	0.28	0.42	0.64	0.81	0.97	1.11	1.24	1.36	1.47	1.58	1.68	2.14	2.54	2.91	3.25
12.5:1	8	0.34	0.53	0.83	1.08	1.31	1.51	1.70	1.88	2.05	2.21	2.37	3.07	3.70	4.28	4.82
10:1	10	0.42	0.68	1.09	1.44	1.75	2.04	2.31	2.56	2.81	3.04	3.27	4.06	4.94	5.75	6.52
8.3:1	12	0.52	0.85	1.39	1.85	2.27	2.66	3.02	3.37	3.70	4.02	4.33	5.77	7.07	8.28	9.42
7.1:1	14	0.62	1.02	1.69	2.26	2.79	3.28	3.74	4.18	4.61	5.02	5.42	7.27	8.95	10.52	12.01
6.3:1	16	0.71	1.19	1.98	2.67	3.31	3.90	4.46	5.00	5.52	6.02	6.51	8.78	10.86	12.81	14.65
5.5:1	18	0.80	1.35	2.27	3.07	3.82	4.51	5.17	5.81	6.42	7.02	7.59	10.30	12.78		
5:1	20	0.89	1.50	2.55	3.47	4.32	5.12	5.88	6.61	7.32	8.01	8.68	11.92	14.84		
4:1	25	1.09	1.88	3.23	4.43	5.54	6.59	7.60	8.57	9.51	10.43	11.32				
3.3:1	30	1.28	2.23	3.86	5.32	6.69	7.99	9.23	10.43	11.60	12.74	13.85				
2.5:1	40	1.61	2.83	4.98	6.92	8.74	10.48	12.15	13.77							
2:1	50	1.88	3.33	5.89	8.22	10.42	12.52	14.55								

46 Centre for Environmental Training

Temporary earth banks

47 Centre for Environmental Training

Slope Length / Steepness (LS)

- If temporary earth banks were introduced every 20 metres, what is the LS-factor?
- What implication would this have for the A value (Calculated soil loss)?

48 Centre for Environmental Training

LS-factor

Table A1 LS-factors on construction sites using the RUSLE

Slope ratio	Slope gradient (%)	Slope length (m)														
		5	10	20	30	40	50	60	70	80	90	100	150	200	250	300
100:1	1	0.09	0.11	0.13	0.15	0.16	0.17	0.18	0.19	0.19	0.20	0.20	0.23	0.24	0.26	0.27
50:1	2	0.14	0.18	0.24	0.28	0.31	0.34	0.36	0.39	0.41	0.43	0.44	0.52	0.58	0.64	0.69
33.3:1	3	0.17	0.24	0.34	0.41	0.47	0.52	0.57	0.61	0.65	0.69	0.72	0.87	1.00	1.11	1.22
25:1	4	0.21	0.30	0.44	0.54	0.63	0.71	0.78	0.85	0.91	0.97	1.03	1.26	1.47	1.65	1.82
20:1	5	0.24	0.36	0.54	0.68	0.80	0.91	1.01	1.10	1.19	1.27	1.35	1.70	2.00	2.28	2.53
16.6:1	6	0.28	0.42	0.64	0.81	0.97	1.11	1.24	1.36	1.47	1.58	1.68	2.14	2.54	2.91	3.25
12.5:1	8	0.34	0.53	0.83	1.08	1.31	1.51	1.70	1.88	2.05	2.21	2.37	3.07	3.70	4.28	4.82
10:1	10	0.42	0.68	1.09	1.44	1.75	2.04	2.31	2.56	2.81	3.04	3.27	4.06	4.94	5.75	6.52
8.3:1	12	0.52	0.85	1.39	1.85	2.27	2.66	3.02	3.37	3.70	4.02	4.33	5.77	7.07	8.28	9.42
7.1:1	14	0.62	1.02	1.69	2.26	2.79	3.28	3.74	4.18	4.61	5.02	5.42	7.27	8.95	10.52	12.01
6.3:1	16	0.71	1.19	1.98	2.67	3.31	3.90	4.46	5.00	5.52	6.02	6.51	8.78	10.86	12.81	14.65
5.5:1	18	0.80	1.35	2.27	3.07	3.82	4.51	5.17	5.81	6.42	7.02	7.59	10.30	12.78		
5:1	20	0.89	1.50	2.55	3.47	4.32	5.12	5.88	6.61	7.32	8.01	8.68	11.92	14.84		
4:1	25	1.09	1.88	3.23	4.43	5.54	6.59	7.60	8.57	9.51	10.43	11.32				
3.3:1	30	1.28	2.23	3.86	5.32	6.69	7.99	9.23	10.43	11.60	12.74	13.85				
2.5:1	40	1.61	2.83	4.98	6.92	8.74	10.48	12.15	13.77							
2:1	50	1.88	3.33	5.89	8.22	10.42	12.52	14.55								

Erosion Control Practice (P)

- Relates to surface condition rather than cover
- Reduced by practices that reduce both the velocity of runoff and the tendency of runoff to flow directly downhill, e.g.
  - Track walking up/down slope rather than across slope
  - Straw crimping
  - Loose soil surface
- Blue Book Reference Appendix A, Section A5

Erosion Control Practice (P)

Table A2 P-factors for construction sites (Goldman et al., 1986)

Surface condition	P-factor
Compacted and smooth	1.3
Track-walked along the contour[6]	1.2
Track-walked up and down the slope[7]	0.9
Punched straw[8]	0.9
Loose to 0.3 metres depth	0.8

- Default P factor is 1.3

Erosion Control Practice (P)

- Now assume the surface has been track walked along the contour

What is the P-factor?

- Now assume the surface has been track up and down the slope
- Why would track walking up and down the slope be better?

What is the P-factor?

Cover Type (C-factor)

- Blue Book Reference Appendix A, Section A6
- A measure of the amount and effectiveness of ground cover
- Reduce the erosion hazard by maintaining good ground cover (lower C-factor) – a key erosion control practice!
- Proper rehabilitation should ensure C-factors drop to below 0.15 within 20 days of completing work

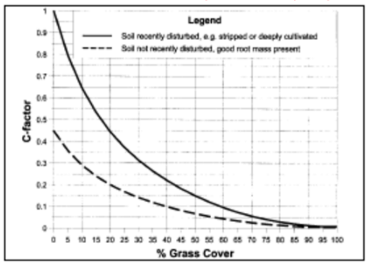
Cover Type (C-factor) for grass

Grass Cover	C-Factor
No cover, soil smooth and compacted	1.0 **(High)**
20 %	0.45 **(Med)**
50 %	0.15 **(Low)**
70 %	0.05
100%	< 0.01

55 Centre for Environmental Training cet

C-factor in RUSLE

- Blue Book Reference Figure A5 (page A-12)



56 Centre for Environmental Training cet

Cover Type (C-factor)

- Assume there is no grass cover and the surface is smooth and compacted

What is the C-factor?

What effect would 20% of newly established grass cover (or equivalent) have on the C-factor?

- BB Ref Appendix A, Table A3 Soil Stabilisation Control Matrix shows C-factors for various surface treatments
- Default C factor is 1.0

57 Centre for Environmental Training cet

Cover Type (C)

- Reduce the erosion hazard by maintaining good ground cover (lower C-factor) – a key erosion control practice!
- Proper rehabilitation should ensure C-factors drop to below 0.15 within 20 days of completing work
- So, how do we achieve a suitable C-factor?

58 Centre for Environmental Training cet

Estimates of soil loss

Estimates of soil loss helps to:

- Assess erosion risk
- Identify measures to overcome erosion risk
- Compare effectiveness of erosion control measures
- Estimate capacity of sediment basins

59 Centre for Environmental Training cet

RUSLE

- Equation:

$$A = R \times K \times LS \times P \times C$$

Where:

- A = Computed soil loss (tonnes/ha/year)
- R = rainfall erosivity factor
- K = soil erodibility factor
- LS = slope length / gradient factor
- P = erosion control practice factor
- C = ground cover and management factor

60 Centre for Environmental Training cet

RUSLE

Limitations:
- Only predicts sediment entrained by erosion
- Predicts average annual soil loss, not soil loss for one storm event
- Effective for sheet and rill erosion on slopes <300 metres, but not concentrated flow or long slopes
- Does not adequately take into consideration dispersibility in K-factor

61 Centre for Environmental Training cet

RUSLE worked exercise

- Consider you are to prepare a laydown area 100m x 50m at a site in Moolarben
- Prior to construction the site has 50% grass cover
- The topsoil will be stripped and stockpiled and the surface graded
- The resultant soil surface will be smooth and compacted
- How will the C-factor change?

62 Centre for Environmental Training cet

Cover Type (C-factor) for grass

Grass Cover	C-Factor
No cover, soil smooth and compacted	1.0 **(High)**
20 %	0.45 **(Med)**
50 %	0.15 **(Low)**
70 %	0.05
100%	< 0.01

63 Centre for Environmental Training cet

RUSLE worked exercise

- The slope is 3% along the long axis of the site
- The soils are 600mm of silty clay loam topsoil (K = 0.04) overlying light-medium clay subsoil (K = 0.018)
- Calculate the post construction A value (estimated soil loss)

64 Centre for Environmental Training cet

RUSLE worked exercise

- Post-construction soil loss
- Equation:

$$A = R \times K \times LS \times P \times C$$

A = R x K x LS x P x C

A = 1,300 x 0.018 x 0.72 x 1.3 x 1.0

A = 21.90 tonnes/ha/year

65 Centre for Environmental Training cet

RUSLE exercise

- How much will you have reduced soil loss by stripping and stockpiling the topsoil?

66 Centre for Environmental Training cet

RUSLE exercise

- How much will you have reduced soil loss by stripping and stockpiling the topsoil?
- Equation:

A = R x K x LS x P x C

A = R x K x LS x P x C

A = 1,300 x 0.040 x 0.72 x 1.3 x 1.0

A = 48.67 tonnes/ha/year

Soil loss is reduced from 48.67 tonnes/ha/year to 21.90 tonnes/ha/year, a reduction of 26.77 tonnes/ha/year

67 Centre for Environmental Training cet

Discussion

Which of the previous erosion factors can be readily manipulated to reduce the erosion hazard on your construction site, and how?

- Rainfall, soil type – NO
- Slope length, cover type - Possible
- Conservation practice – DEFINITELY!

68 Centre for Environmental Training cet

RUSLE

- What is the A value if improved practices are adopted including track walking up and down the slope and installation of temporary earth banks at 20 metre spacing?

69 Centre for Environmental Training cet

RUSLE

- What is the A value if improved practices are adopted including track walking up and down the slope and installation of temporary earth banks at 20 metre spacing?
- Equation:

A = R x K x LS x P x C

A = R x K x LS x P x C

A = 1,300 x 0.018 x 0.34 x 0.9 x 1.0

A = 7.16 tonnes/ha/year

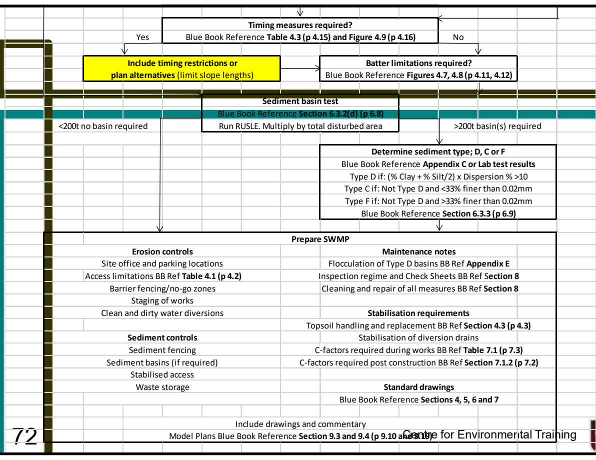
70 Centre for Environmental Training cet

Soil loss classes

- Seven Soil Loss Classes based on RUSLE, BB Ref Table 4.2 (p 4-13)

Soil Loss Class	Calculated soil loss (tonnes/ha/yr)	Erosion hazard
1	0 to 150	very low
2	151 to 225	low
3	226 to 350	low-moderate
4	351 to 500	moderate
5	501 to 750	high
6	751 to 1,500	very high
7	>1,500	extremely high

71 Centre for Environmental Training cet

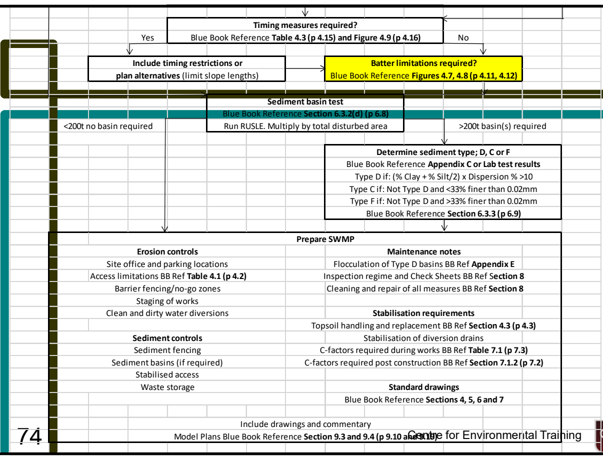


72 Centre for Environmental Training cet

Timing Restrictions

- Soil Loss Class dictates recommended timing restrictions for works
- BB Reference Table 4.3 (p 4.15)
- Highlights months when work should or should not proceed
- At time when activity should be avoided:
  - C-factor >0.1 only when 3-day forecast suggests rain unlikely
  - Management regime in place for rapid stabilisation if required (RECPs etc.)

73 Centre for Environmental Training cet



74 Centre for Environmental Training cet

Batter limitations

- Blue Book Reference Section 4, Figure 4.7 and 4.8 (pages 4-11 and 4-12)

75 Centre for Environmental Training cet

Batter limitations

Relates batter gradients on constructed slopes to:

- R-factor (select correct chart)
- K-factor and Slope Length (metres)
- Read off maximum batter gradient recommendation

76 Centre for Environmental Training cet

Conclusion

- Managing the factors that you can control can deliver significant benefits in terms of reducing erosion hazard
- Always consider reducing slope length and if possible slope gradient
- Apply as much cover as possible as soon as possible after completion of works
- Pay attention to conservation practice

77 Centre for Environmental Training cet