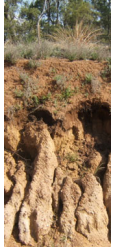


Demonstration 1



Soil and Water Interactions



1

Centre for Environmental Training cet

Dispersive Soils

- Structurally unstable in water, breaking down to constituent parts – sand, silt and clay
- Emerson Aggregate Test commonly used to identify problem soils
- Slaking vs. Dispersion – both problematic
- Mechanical dispersion

2

Centre for Environmental Training cet

Unstable Soils



What do you notice about the 3 different soil/water interactions?



3

Centre for Environmental Training cet

Dispersive Soil Problems

- Highly erodible if exposed
- Hardsetting and low permeability
- May generate turbid runoff and include attached nutrients or metals (piggy-backing)
- Severe rilling of exposed (vertical) surfaces
- High risk of tunnel erosion or piping when used for earthworks

4


Centre for Environmental Training cet






Sodic Soils

- All sodic soils are dispersive but not all dispersive soils are sodic
- Cation Exchange Capacity (CEC) (K^+ , Na^+ , H^+ , Ca^{++} , Mg^{++} , Al^{+++}) dominated by sodium (Exchangeable Sodium Percentage - ESP)
- Fluting is a common indicator of sodic soils




Centre for Environmental Training 

8

Management of Soil

- (1) Expose only by necessity
- (2) Cover with non dispersive soil before applying further treatments (erosion controls) or revegetation
- (3) Soil Amelioration:
 - Gypsum application can significantly improve soil stability (dry preferred to liquid form)
 - Blending best approach at application rates 5 – 35 t/ha


Centre for Environmental Training 

9



Management in Water

- Turbid water in sediment basins etc.
- Require flocculants to enhance settling and improve water clarity:
 - Gypsum (calcium sulphate) - ~50mg/L
 - Alum (aluminium sulphate)
 - Poly Aluminium Chloride (PAC)
 - Poly Acrylamide (PAM, i.e. Zetag)
 - Other proprietary compounds (Phoslock)

Centre for Environmental Training 

11



Central Coast Council
Practical Erosion and Sediment Control for the Workforce
1 July 2024

