

# FUNDAMENTALS OF SOIL MANAGEMENT

## Core Principle 4: Remediation Techniques

### PRINCIPLE 4: REMEDIATION TECHNIQUES - SOIL CONSERVATION STRUCTURES & ENGINEERING

Large scale erosion can be daunting to tackle. Evaluate the cause of the erosion, plan how to minimise the problem and find appropriate options for rehabilitation.

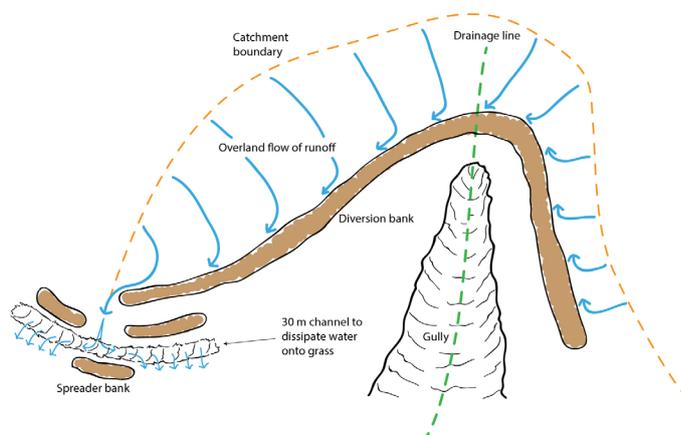
**The techniques below introduce strategies and engineered structures for remediation.**

#### Low input remediation methods:

- Fencing, seeding, fertilising, and mulching to encourage revegetation and natural recovery of eroded or scalded areas.
- Dispersive soils are challenging to rehabilitate as the subsoil is high in sodium (sodic soils) which is unfavourable to plants. Gypsum may assist to stabilise and promote grass establishment. Manure or compost may facilitate seedling growth.
- Rotational grazing and spelling - wet season spelling, light stocking rates and rotational grazing can be options to rehabilitate small scale small catchment erosion.
- Stick raked structures to slow runoff flow and promote water infiltration.

#### Medium input remediation methods

- Diversion banks:
  - Consult a technical adviser for site selection, design and surveying.
  - For more details on designing and surveying a diversion bank see Chapter 8 of the *Soil Conservation Guidelines for Queensland*.
- Dam construction (gully control):
  - Dams can be effective gully control if there is a dual benefit as water infrastructure. Importantly suitable dam by-wash areas are best on both sides of the wall.
  - See *BMRG Gully Erosion Manual* section 6.2 for dam construction and maintenance.
- Pondage banks:
  - Pondage banks can be a productive solution to erosion control.
  - They can trap silt and slow runoff and can be treated like a dam to hold water in the catchment for longer.
  - Get an experienced technical officer or contractor to assist with design and surveying to ensure by-wash and levels are accurate.
- Deep ripping:
  - For water infiltration and retention or to treat tunnel erosion.



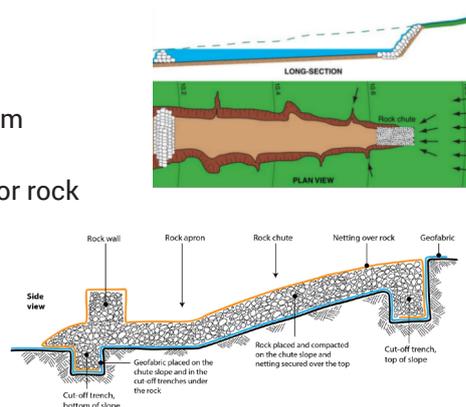
**High input remediation methods – to protect crucial structures or productive land**

**Silt trap weirs**

- Cheap to build with wire mesh, star pickets and materials sourced from around the erosion area (fallen timbre, rocks).
  - Hay bale, wire netting, coir logs, weirs and porous stick structures, or rock check dams.

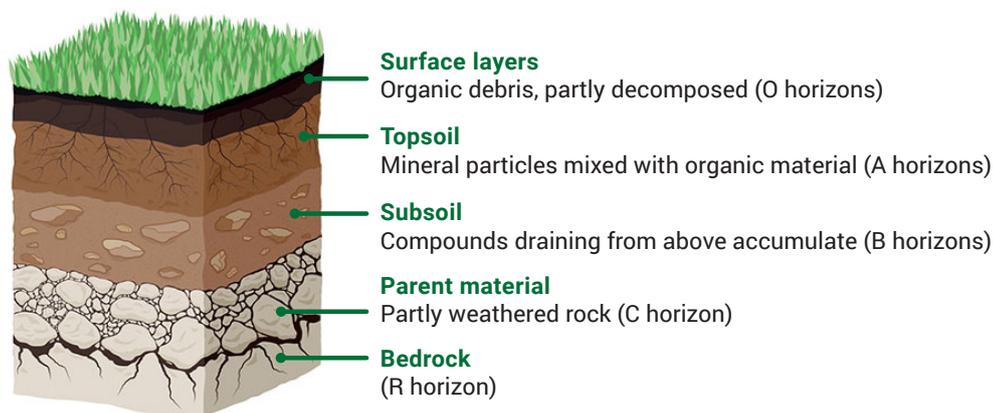
**Chutes: Rock and Geofabric**

- Effectively stabilise gully heads and prevent further soil movement.
- Reduce flow depth and water velocity energy dissipates as it flows of the construction.



**Things to remember**

- Erosion is a threat to QLD agriculture.
- Natural factors such as climate, slope, soil type, rainfall intensity & season, landscape shape, catchment area, effect erosion risk.
- Soil provides nutrients and structure for plants to thrive.
- Loss of topsoil reduces fertility and overall productivity.
- Keep topsoil in place with plenty of grass as the top 10-15cm of soil contains most of the plant's nutrients and microorganisms that promote soil health.
- How you manage your vegetation, including pastures, shrubs, forbs and tree density is key to soil conservation.
- One-size does not fit all which is why it is important to analyse your landscape function and overall health.
- Improvement is possible for any landholder.



**LANDHOLDER TESTIMONIAL**

“A gully was insitu when we purchased the property, it had formed from an old contour bank that ended on a road and dropped into a steeper creek bank. Part of the remediation plan was to provide groundcover immediately with hay and also undersow with grass seed. Heavy falls of rain on the bare ground have been the main challenge in managing erosion. However, the hay provides such simple protection on the slope. The gully is fully remediated, grassed-up, and completely productive again. BMRG was excellent to work with, providing extensive advice and resources to refer to in the future.”

– Yolanda and Steve Webster, Manumbar, QLD.

For more information on soil conservation and gully remediation techniques please see the Gully Erosion; Options for Prevention and Rehabilitation – Experiences from the Burnett and Mary River Catchments, Queensland (BMRG Gully Erosion Manual).

