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Corangamite Catchment Management Authority and the City of Greater Geelong

A.S. Miner Geotechnical

Case Study for Erosion and Landslides.

Penny Royal Erosion – Clissolds

Report No:

Prepared for Troy Clarkson

Department of Primary Industries

PO Box 103

Geelong, VIC 3220

and

Leigh Dennis

Corangamite Catchment Management
Authority

64 Dennis Street

Colac, VIC 3250

1. Site Description

1.1 Site I.D.

1.2 Site address

Neville and Claire Clissolds

485 Pennyroyal Valley Rd, Deans Marsh

1.3 Brief site description and general overview

This gully/tunnel erosion site occurs on the property of Neville and Claire Clissolds on the Pennyroyal Valley Road, near Deans Marsh. The area is gently to steep hills around the site and is predominantly used for grazing. The site itself is dispersive, sodic soils with a small steep catchment of approx. 5ha above the gully site.

The site has been an erosion issue in the past where tunnelling has occurred down the drainage line. This section was planted out to trees around 15 years ago which seemed to reduce the tunnelling to some extent. The site is directly above the Pennyroyal Valley Road and only 80m from the Pennyroyal creek, which is a priority waterway for the CCMA.

1.4 Map datum/ Map projection/ Zone

NA

1.5 Easting

240 0572E

1.6 Northing

233 9413N

1.7 Municipality

Colac Otway

1.8 CCMA landscape zone

Upper Barwon

1.9 Previous ID

NA

1.10 Previous Data Source

NA

2. Hazard Description

2.1 Soil degradation type

Erosion

2.2 Soil degradation sub-class

Gully and tunnel

2.3 Description of hazard present on site or threatening site from above or below

The hazard at the site is tunnel erosion, a length of less than 100m along a drainage line. A small section of this has collapsed and created tunnel erosion. This site is above the Pennyroyal valley road and sediment being removed for the site via the tunnelling is being deposited on the road. There is a small 'exit' hole from the tunnelling where sediment fans out on the road side. The danger is that more extensive undercutting of the road may be occurring but is not yet visible. With the site being so close to the Pennyroyal Creek there is also a high risk that, in heavy rainfall events, sediment may be transported into the water system.

2.4 Dimensions of Hazard (width, length and depth if appropriate)

Length of initial tunnelling hazard was approx. 100m.

Dimensions of the collapsed gully are 15m (L), 2 – 3m (depth), 3 – 5m (W).

2.5 Extent of Hazard (spatial area and volume if appropriate)

The gully resulting from the collapsed tunnelling covers an area of around 90 square meters.

2.6 Magnitude of hazard (travel distance or rate of occurrence)

The tunnelling had been occurring slowly over 15 years. While the gully didn't have an actively moving head as such, the rate of tunnel collapse would increase each year. A length of 15m collapsed in one winter.

2.7 List previous reports or studies relevant to this site

Groundworks plan, Shari Wallis, DPI Geelong

2.8 Custodian of previous reports and studies

Shari Wallis, DPI Geelong

3. The Event Has Already Occurred

3.1 Date of first occurrence

Tunnel collapsed during the winter of 2005

Tunnelling had been occurring for 15years.

3.2 Date of most recent re-activation or acceleration

2005 and again in 2006

3.3 Actual or postulated trigger event including magnitude and duration

Assumed to be high rainfall event

3.4 Frequency of Trigger Event if known

NA

3.5 What damage or impact occurred?

Loss of access to part of the paddock as the collapsed area took out an un-made track.

The site has the potential to damage the Pennyroyal Valley Road by sediment loading on the road and the possibility of scouring out under the road. There is also a potential loss of water quality if sediment was to reach the near by creek

3.6 Was there a risk of injury or loss of life?

There is a risk of injury in an extreme case if damage to the road occurred and resulted in an accident

3.7 How important was it?

The site was of high importance to the landholder as it prevented access to part of the paddock. It was of moderate importance to the CCMA and possibly Vic Roads due to the potential risk to the waterway and the road itself.

3.8 What asset classes were impacted?

Water Quality

Infrastructure – farm track

- gravel road

3.9 What asset sub classes were impacted?

3.10 What are the asset values?

Water quality unknown

3.11 How severely were assets impacted?

Only minor impacts at this stage

3.12 Estimated cost of impact (including qualitative and quantitative costs for loss of asset, investigations, remedial works, cultural, business and environment)

CMIS grant of \$3000 covered approx. 60% of earthworks (contract hire, rubbish removal, clay backfill, top soil and sowing down)

4. Remediation Has Already Been Undertaken

4.1 What remediation option was used?

Site preparation involved removal of rubbish – not completed properly by the contractors

Earthworks – gully battering, bringing in fill, compaction

4.2 How was the site initially assessed?

Visually by CMA, DPI and Landcare staff and the contractor

4.3 How was the remediation designed and by Who?

Greg Turner and Simone Wilkinson, CCMA

4.4 Did it require specialist equipment or subcontractors?

Just contractors for earthworks

4.5 How effective has the remediation been?

Ineffective – tunnelling must have continued or compaction of area was insufficient because a new area collapsed in, further reducing the landholders access via that track.

4.6 How was the effectiveness judged?

It is very obvious visually

4.7 Would other treatments worked here?

Further groundwork's may be required to fill and compact the new hole

4.8 Was it early intervention or reactive?

Partly reactive but also getting in before the situation worsened

4.9 What was the cost of remediation (including design, construction and implementation)?

Total cost of the works, including rubbish removal, imported clay, erosion repair and sowing down with seed was \$4810

4.10 How was the remediation funded?

A CMIS grant put \$3000 towards the project.

5. Ongoing Review and Monitoring Requirements

5.1 What is the likely ongoing monitoring and review strategy?

NA

5.2 What is the nature of future monitoring and maintenance?

NA

5.3 What are the likely costs of monitoring and maintenance?

NA

Photos



Photo 1 Initial site assessment prior to works February 2005. Photo taken looking east



Photo 2 After works, same site as above photo, taken May 2005

Photos



Photo 3 2006. After fencing and revegetation of site.



Photo 4 Before (Feb 2005) and after (May 2005) photos of collapsed gully section.
Photo taken looking west

Photos



Photo 5 November 2006, a section of the track has re-collapsed, opening up a 2m sq. 'cave' under the area previously worked on.



Photo 6 The tunnel erosion 'exit' site is on the edge of the Pennyroyal Valley Road and deposits sediment on the road. Sediment was still being deposited after works were completed at the Nov. 2006 inspection.