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Corangamite Catchment Management Authority and the City of Greater Geelong

A.S. Miner Geotechnical

Case Study for Erosion and Landslides.

Horsehill West Rd, Elaine

Report No: 356.3/33/06

INCOMPLETE

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.

356.3/33

1.2 Site address

Horsehill West Rd, Elaine (Gallows property)

1.3 Brief site description

This site is situated in weathered Ordovician sedimentary rocks along a tributary to Williamson Creek. A substantial depth of regolith is exposed in the deeply incised gullies at the site, which is atypical for the Ordovician rocks in the district. The close proximity to Williamson Creek Fault is almost certainly a factor in the depth of weathering and may be an influence in the development of the impressive tunnel and gully erosion at the site.

1.4 Map datum/ Map projection/ Zone

MGA Zone 54 (GDA94)

1.5 Easting

E 758430

1.6 Northing

N 5814890

1.7 Municipality

Moorabool

1.8 CCMA landscape zone

Leigh

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

Extensive gullying and tunnel erosion exist at the site and have the potential to impact access roads and some drop structures in the head of the gully.

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

Depth was in excess of 5 m in places

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

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

Unknown [Check with Troy](#)

2.7 List previous reports or studies relevant to this site

A.S. Miner Geotechnical (2002) Leigh Districts Soil Erosion Tour Letter Report to NRE.
Dated 13 May 2002.

2.8 Custodian of previous reports and studies

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3. The Event Has Already Occurred

3.1 Date of first occurrence

Unknown Check with Troy

3.2 Date of most recent re-activation or acceleration

Unknown Check with Troy

3.3 Actual or postulated trigger event including magnitude and duration

Unknown Check with Troy

3.4 Frequency of Trigger Event if known

Unknown

3.5 What damage or impact occurred?

Extensive gullying has degraded the drainage line to such an extent that the gully is now very difficult to remediate. The concrete drop structure has been undermined and requires significant repairs. The access road is in danger of being undermined and will also need to be stabilised.

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

If the road collapsed late at night and a vehicle did not see the danger it is possible an occupant could be seriously injured.

3.7 How important was it?

Moderately important although most impact is on private land. There is a the likelihood of ongoing sediment load to Williamsons Creek

3.8 What asset classes were impacted?

Land Use, Water Quality and Infrastructure

3.9 What asset sub classes were impacted?

Grazing land, waterways both in the drainage line and sediment loading to the creek and possible impact to roads and existing concrete structures

3.10 What are the asset values?

Grazing land=1, Waterways (minor)=3 to 4 and road (minor)=2 to 3

3.11 How severely were assets impacted?

As discussed the gully is extensively impacted although due to the deep incision the amount of land around the gully effected is still minimal. The road is yet to be impacted whilst the concrete drop structure is un servcieable

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

Concrete drop structure probably of the order of \$5000

4. No Remediation Has Been Undertaken Yet

4.1 What are the remediation options?

The extent of gully and tunnel erosion is beyond any limited solution and requires carefully planned and staged total catchment remedial works probably over a period of a decade and may be beyond the resources of this project. The consensus of discussion at the site was to tackle the erosion from the top of the catchment with the primary focus on halting of the migration of the headward erosion of the main gully.

Initial works would involve excavation below the current gully-head structure to assess the extent of the tunnelling. Depending on the conditions of the footings it may be necessary to construct a concrete key into solid foundation materials and backfill the excavation with either well compacted on site materials or a bentonite cement sand mixture which would provide a hydraulic barrier to water at the location. An exploratory excavation and reconnaissance site investigation would assess the requirement for future works. A more detailed specification could then be prepared with better estimates of materials and equipment requirements.

The short term stability of the road is also of concern, although may not be a priority for funding under this project. When the road collapses, the simple and practical solution will be to repair the road as it fails by backfilling the trench with rock. Although it is not a long-term solution it would be the most economical way of dealing with the problem.

Nevertheless, we believe that NRE is legally obligated to warn the property owners of the imminent collapse of the road (who are probably aware of the fact) and encourage them to address the problem and warn other users of the road (cabin occupants) with appropriate warning signs at this point.

4.2 How will the site be assessed?

Through the specialist group involving extension officers, geologists and engineers

4.3 How will the remediation be designed and by who?

As above

4.4 Will it require specialist equipment or contractors?

Unknown but probably not

4.5 How will effectiveness be judged?

One option is through aerial photo interpretation combined with regular field visits.

Other options include detailed survey control

4.6 Will it be early intervention or reactive?

Reactive given the current extent of the problem

4.7 What is the likely overall cost of remediation?

Unknown but probably substantial

4.8 How will the remediation funded?

Unknown [Check with Troy](#)

5. Ongoing Review and Monitoring Requirements

5.1 What is the likely ongoing monitoring and review strategy?

Not confirmed at this stage but monitoring will be part of the overall solution

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



Sketches and Drawings

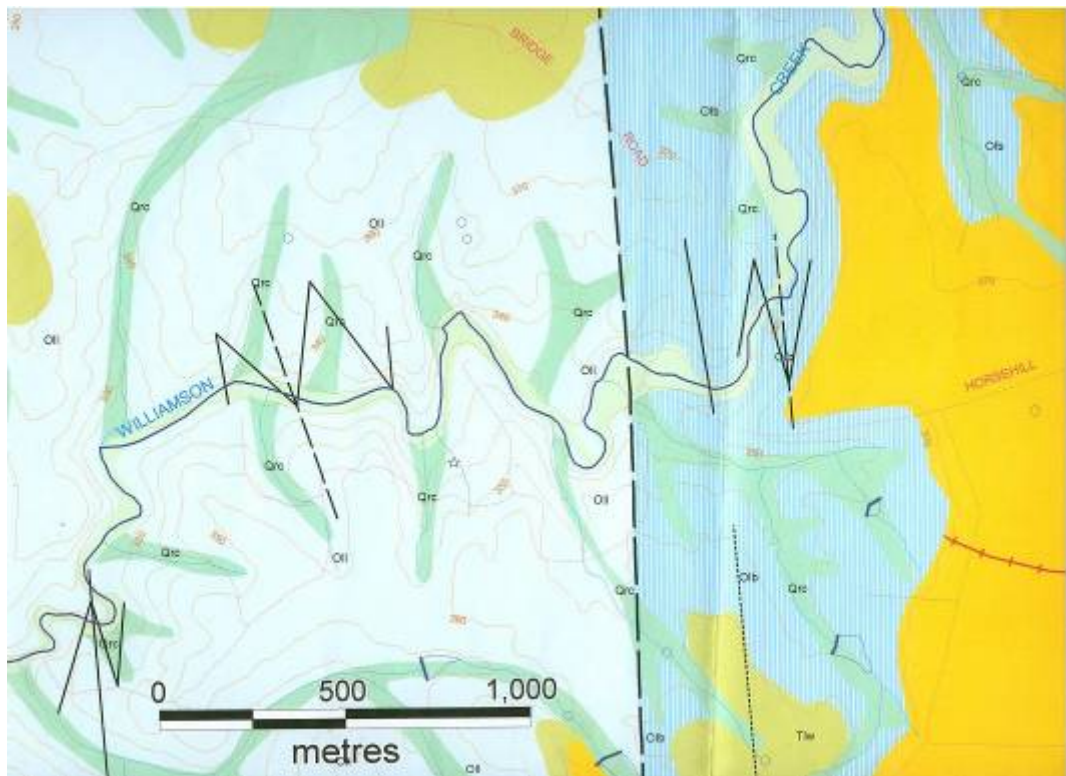


Figure 1 Property locations shown by “star” symbol towards centre of the photo