

a.s.miner
Geotechnical
Consulting Engineers

50 Calder Street, Manifold Heights, VICTORIA 3218

Tel : 03.52294568 Mobile : 0438.294568

ABN 72 856 478 451

Email: aminer@pipeline.com.au

Corangamite Catchment Management Authority and the City of Greater Geelong

A.S. Miner Geotechnical

Case Study for Erosion and Landslides.

Yeodene-Birregurra Rd, Birregurra

Report No: 356.3/06/06

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.

356.3/06

1.2 Site address

Yeodene-Birregurra Rd, Birregurra (Phillips Landslide)

1.3 Brief site description

The site lies on the western banks of the Barwon River flood plain. The upper plateau is relatively flat but the steeper slopes below are very susceptible to slope failures. This is due in part to groundwater discharging at the contact between the upper Moorabool Viaduct Sands and the lower Gellibrand Marl. Undercutting of the toe of slopes by the river is also thought to be a major cause of failure in this localised area. The slide on Bill Phillips property is large and extends all the way down to the river. A number of smaller parasitic slides have occurred around the upper rim or headscarp of the main slide.

1.4 Map datum/ Map projection/ Zone

MGA Zone 54 (GDA 94)

1.5 Easting

E740890

1.6 Northing

N5746820

1.7 Municipality

Colac Otway

1.8 CCMA landscape zone

Upper Barwon

1.9 Previous ID

WF2381

1.10 Previous Data Source

Warren Feltham (2005) CCMA landslide and Erosion Database. Version 2 The University of Ballarat. Geology Department July 2005. Contained in an MapInfo Table entitled "SW_erosion_landslides"

2. Hazard Description

2.1 Soil degradation type

Landslide

2.2 Soil degradation sub-class

Slump with flow component at toe

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

The large landslide has a potential to retrogress into the property above whilst any further reactivation of the lower regions has the potential to block the Barwon River.

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

180m (W) x 280 m (L) x 15 to 25 m (D) estimated from cross sections

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

Approx 5.0 ha but volume unknown but may be of the order of 1.25 million m³

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

Run out could be of the order of 50 m

2.7 List previous reports or studies relevant to this site

Dahlhaus Environmental Geology (2005) Geological Note: Landslide at Phillips Property, Birregurra-Yeodene Road Yeodene.

2.8 Custodian of previous reports and studies

Peter Dahlhaus at Dahlhaus Environmental Geology

3. The Event Has Already Occurred

3.1 Date of first occurrence

Unknown but anecdotal evidence suggest the slide occurred approximately 70 year ago. Review of the 1946 aerials of the area showed a large degraded slide which had occurred prior to this. Discussions with Bill Phillips indicate the current slide occurred possibly 30-40 years ago but probably later than the 1952 wet.

3.2 Date of most recent re-activation or acceleration

Bill Phillips indicated the northern area below the headscarp has been active in the last 5-10 years

3.3 Actual or postulated trigger event including magnitude and duration

Unknown The postulated age of the older landslide corresponds with a sequence of wet months late in 1933 and 1934. Potential triggering events include rainfall of 61.0 mm on the 30/11/1933. The later event may correspond with a number of possible rainfall events throughout the mid sixties with the greatest being 55.9 mm on the 18/11/1964

3.4 Frequency of Trigger Event if known

The potential event of 61.0 mm is ranked 9th out of 37064 daily rainfall records and has an Antecedent Rainfall Probability Exceedance Threshold (or ARPET) value = 0.02%. The 1964 event of 55.9mm ranks 12th out of 37604 daily rainfall records and has an ARPET value =0.03%

3.5 What damage or impact occurred?

There has been a substantial loss of grazing land along the banks of the river. The slide travelled all the way to the river and it is unknown if it blocked the river but there would certainly have been a sediment input as a result

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

Unknown but unlikely

3.7 How important was it?

Moderately to highly important given the potential impact on the river

3.8 What asset classes were impacted?

Land Use

Water Quality

3.9 What asset sub classes were impacted?

Grazing

Waterways

3.10 What are the asset values?

Grazing land=5

Waterways (Major River)=10

3.11 How severely were assets impacted?

Whilst the land has been severely affected the impacts to the river are unknown.

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

Typically grazing land in the Colac Birregurra area would be valued at \$6000/ha. Hence an approximate loss of asset for the lost grazing land is of the order of \$30,000.

4. Remediation Has Already Been Undertaken

4.1 What remediation option was used?

Installation of a deep trench or interceptor drain was completed at the base of the headscarp. Surface drainage and contouring was constructed to avoid any excessive surface ponding. Revegetation works undertaken involving 4000 plants. New fencing to exclude stock on the upper degraded headscarp

4.2 How was the site initially assessed?

Assessed by Andrew McLennan DPI

4.3 How was the remediation designed and by Who?

Designed and supervised by Andrew McLennan DPI

4.4 Did it require specialist equipment or subcontractors?

No -standard excavators were used to construct the deep trench drain.

4.5 How effective has the remediation been?

Unknown as no monitoring plan is in place

4.6 How was the effectiveness judged?

Not evaluated

4.7 Would other treatments worked here?

The use of sub-horizontal drains may have had an application here. Possibly regrading of the head scarp and some form of toe buttressing with scour/erosion protection would also have been beneficial

4.8 Was it early intervention or reactive?

Reactive in a sense that the remedial works have occurred well after the initial slide but the current works are aimed at stopping further movements.

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

Thought to be about \$10K-15K

4.10 How was the remediation funded?

Unconfirmed at this stage.

5. Ongoing Review and Monitoring Requirements

5.1 What is the likely ongoing monitoring and review strategy?

None has been devised

5.2 What is the nature of future monitoring and maintenance?

Not evaluated

5.3 What are the likely costs of monitoring and maintenance?

Not applicable

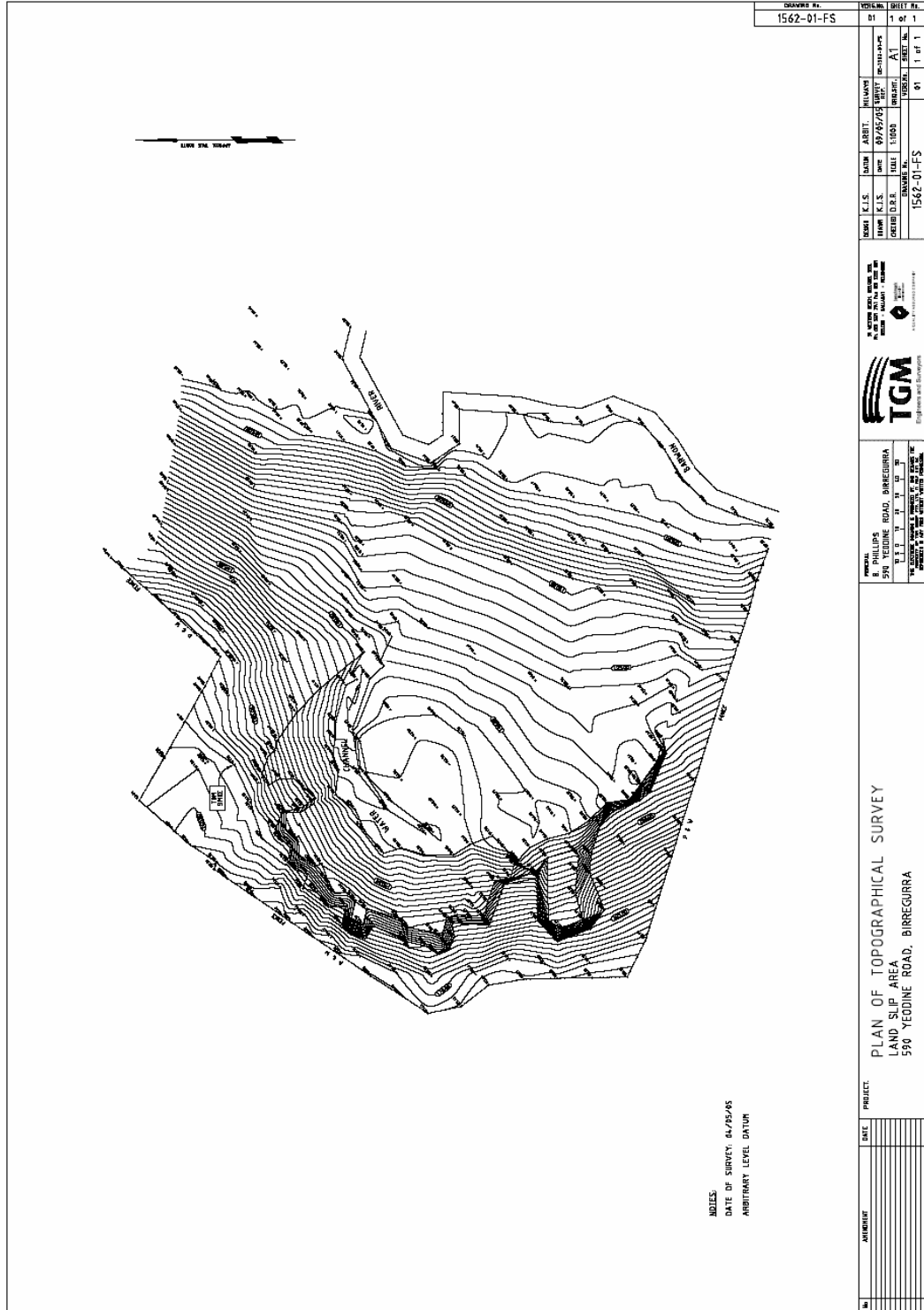
Photos



Photos



Sketches and Drawings



NO.	DATE	PROJECT	SCALE	SHEET NO.
		PLAN OF TOPOGRAPHICAL SURVEY LAND SLIP AREA 590 TEGDINE ROAD, BIRRECURRA	1562-01-FS	1 of 1

DATE	TIME	BY	CHKD.	REVISIONS

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