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## Corangamite Catchment Management Authority and the City of Greater Geelong

**A.S. Miner Geotechnical**

### **Case Study for Erosion and Landslides.**

Lal Lal Reserve

Report No: 356.3/25/06

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.

356.3/25

## 1.2 Site address

Lal Lal Reserve

## 1.3 Brief site description

The site is a small recreation reserve about 18 km southeast of the City of Ballarat. The main feature is a waterfall approximately 35 m high, the upstream migration of which has formed a gorge bordered by steep cliffs along the Lal Lal Creek. Two school girls were tragically killed by a rockfall on 28 March 1990 during an abseiling exercise

## 1.4 Map datum/ Map projection/ Zone

MGA Zone 54 (GDA94)

## 1.5 Easting

E 767870

## 1.6 Northing

N 5828070

## 1.7 Municipality

Moorabool

## 1.8 CCMA landscape zone

Moorabool

## 1.9 Previous ID

NA

## 1.10 Previous Data Source

NA

## 2. Hazard Description

### 2.1 Soil degradation type

Landslide

### 2.2 Soil degradation sub-class

Rockfall

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

The walls of the Lal Lal gorge expose two layers of basalt both exhibiting well formed columnar jointing. As such the main hazard exist below the columnar basalt although ongoing retrogressive degradation of the gorge is occurring but at geological rates.

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

Exact details not recorded but back calculation from the volume (see next section) indicate a probable dimension of 1.0 m (L) by 0.5 m (Diameter)

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

Volume of the fatal rockfall was estimated to be 0.2 m<sup>3</sup>

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

Very rapid

### 2.7 List previous reports or studies relevant to this site

Cooney a.m. 1990. Geological report on the rockfall at Lal Lal. A report for the Deputy Coroner. Unpublished Report 1990/13 GSV

Dahlhaus P and Miner A. 2000. Estimating the occurrence of rockfalls in columnar basalt.

### 2.8 Custodian of previous reports and studies

P. Dahlhaus

### 3. The Event Has Already Occurred

#### 3.1 Date of first occurrence

Date of fatal rock fall was 28 March 1990

#### 3.2 Date of most recent re-activation or acceleration

At least 3 other rockfalls occurred between the period 1972 to 1990

#### 3.3 Actual or postulated trigger event including magnitude and duration

It is probable disturbance during abseiling may have loosened or accelerated movement but rockfalls were known to regularly occur at the site through the processes of weathering and rainfall

#### 3.4 Frequency of Trigger Event if known

Based on average erosion rates within the Lal Lal gorge it is estimated that a similar size fall could occur on average every 5 to 7 years at this site along this face of the valley

#### 3.5 What damage or impact occurred?

No infrastructure was present

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

2 deaths occurred as a result of injuries sustained

#### 3.7 How important was it?

Extremely important due to tragic loss of life.

#### 3.8 What asset classes were impacted?

People and community

#### 3.9 What asset sub classes were impacted?

People

#### 3.10 What are the asset values?

Highest possible

#### 3.11 How severely were assets impacted?

Catastrophically

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

Irreplaceable and tragic loss to the community and immeasurable disruption to social fabric of the school and the supervising teachers.

The BTE report on natural geohazards places a tentative figure of \$1.3 million per life lost as in 2003.

Cost will have also be significant for the coronial report and hearing and may have been of the order of \$20,000 -\$30,000

## 4. Remediation Has Already Been Undertaken

### 4.1 What remediation option was used?

NA

### 4.2 How was the site initially assessed?

NA

### 4.3 How was the remediation designed and by Who?

NA

### 4.4 Did it require specialist equipment or subcontractors?

NA

### 4.5 How effective has the remediation been?

NA

### 4.6 How was the effectiveness judged?

NA

### 4.7 Would other treatments worked here?

NA

### 4.8 Was it early intervention or reactive?

NA

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

Coroners report may have been of the order of \$20,000

### 4.10 How was the remediation funded?

Unknown

## 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







Figure 6. Undercut columns with open joints.

## Sketches and Drawings