Feature and Level Survey

Assessment of potential Karst Features (Caves and fissures)

M08/06 Sub Lease 3H/034
Ashburton Mineral Field
Exmouth
Western Australia

Exmouth Quarries and Concrete

26 August 2011

ReJenn Rehabilitation and Conservation

SURVEY REPORT

CLIENT: Exmouth Quarries and Concrete **PROJECT DESCRIPTION:** Survey of topographical features for Karst caves or fissures.

INTRODUCTION

The aim of this project was to determine the location, extent and profile of any large caves to verify the existing sketchy historic information.
Field survey was undertaken to provide the following data.

1. Mapping of infrastructure and surface levels at ground level.
2. Extent of caves including their surface profile where possible.

BACKGROUND

The subterranean habitats of the Cape Range area are of two types;
The first habitat is within the range itself, which are either dry or have perched aquifers.
The second habitat is an extensive flooded underground Karst system located on the flat coastal plain up to 2 km wide of the peninsula and extending under the foothills. This coastal fauna is aquatic and unrelated to that of the range
The Cape Range is included in a Top Ten List of Endangered Karst Ecosystems *(US Karst Waters Institute Culver, 1997*)
Investigations of coastal Karst have led to the discovery of anchialine habitat in Bundera Sinkhole.
The Mandu Limestone interface is located well below the excavation proposed; geological exposure over the proposed area is Tulki and Trealla Limestone. See Figure 1.

The proposed EQC quarry has been located in consultation to the following references to determine the appropriate features that should apply to the location of the quarry site from the perspective of limiting environmental impacts to karst features:

- Cave and Karst Management in Australasia 11, proceedings of the eleventh Australasian Conference on Cave and Karst Management, 1995.
- Karst Management Considerations for the Cape Range Karst Province Western Australia (*Hamilton-Smith, Kiernan, and Spate, 1998*).
- Guidelines for Cave and Karst Protection (*Watson J, Hamilton-Smith E, Gillieson D and Kieran K, 1997).*

The siting of the quarry face and direction of work has the following positive characteristics;

- Located toward the eastern margin of Cape Range where Karstic features are not as frequent as on the crest of Cape Range.
- There are no caves identified as defined by the Australian Speleological Federation.
- The quarry site is located in a large limestone area leaving a substantial part of the limestone undisturbed.

See Figure 2.

METHODOLOGY

GPS was utilized to provide survey control points for the project area and to connect the survey to the Map Grid of Australia Coordinate System.
Control Points were to be placed at the strategic points in the vicinity of any large cave mouths to facilitate the use of conventional surveying equipment in the event of identification of any substantial caves as defined by the Australian Speleological Federation.

RESULTS

By combining the surface models from the ground survey, cross sections and a longitudinal section have been prepared for the site. See the attached drawings sheets 1 to 3.

ADDITIONAL COMMENTS

Evidence of erosion and fissures was noted between karst feature 1 and karst feature 2.
The position and extent of karst feature 3 was recorded for position only for plotting purposes.
Photographs of karst features 1 and 2 are attached.

Figure 1 Surface Geology M08/06

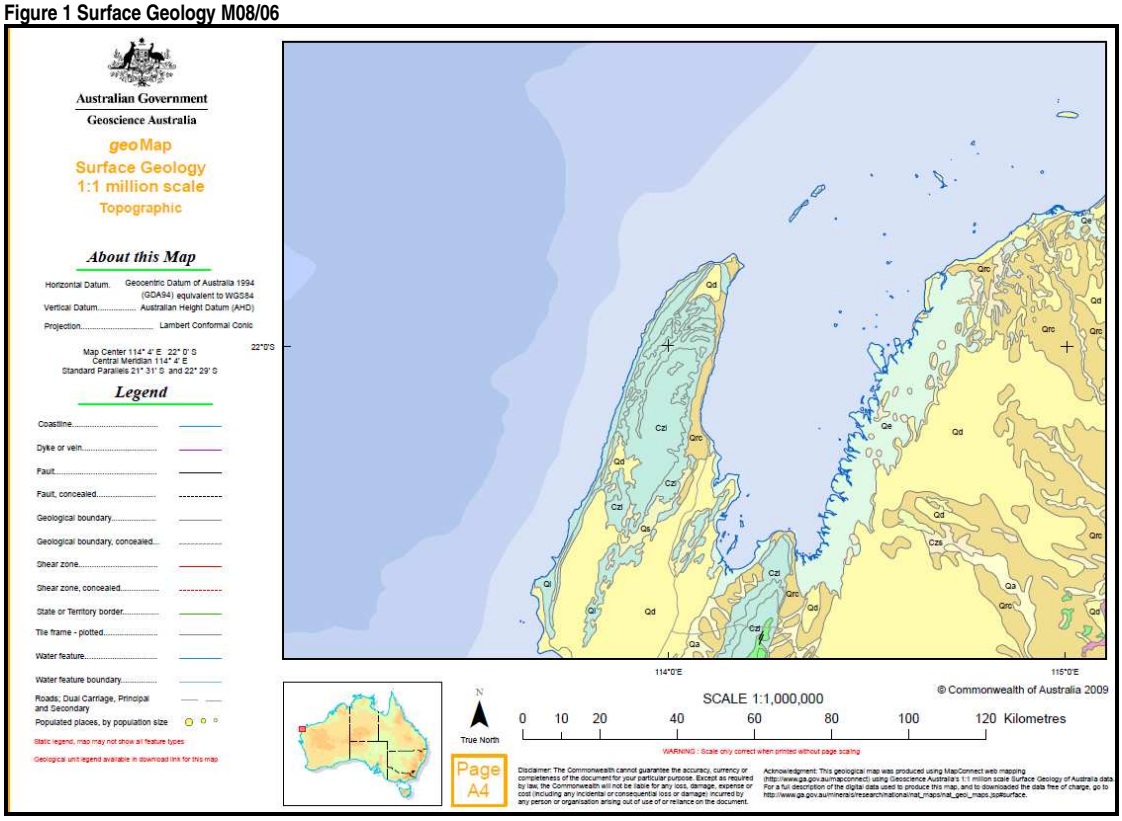
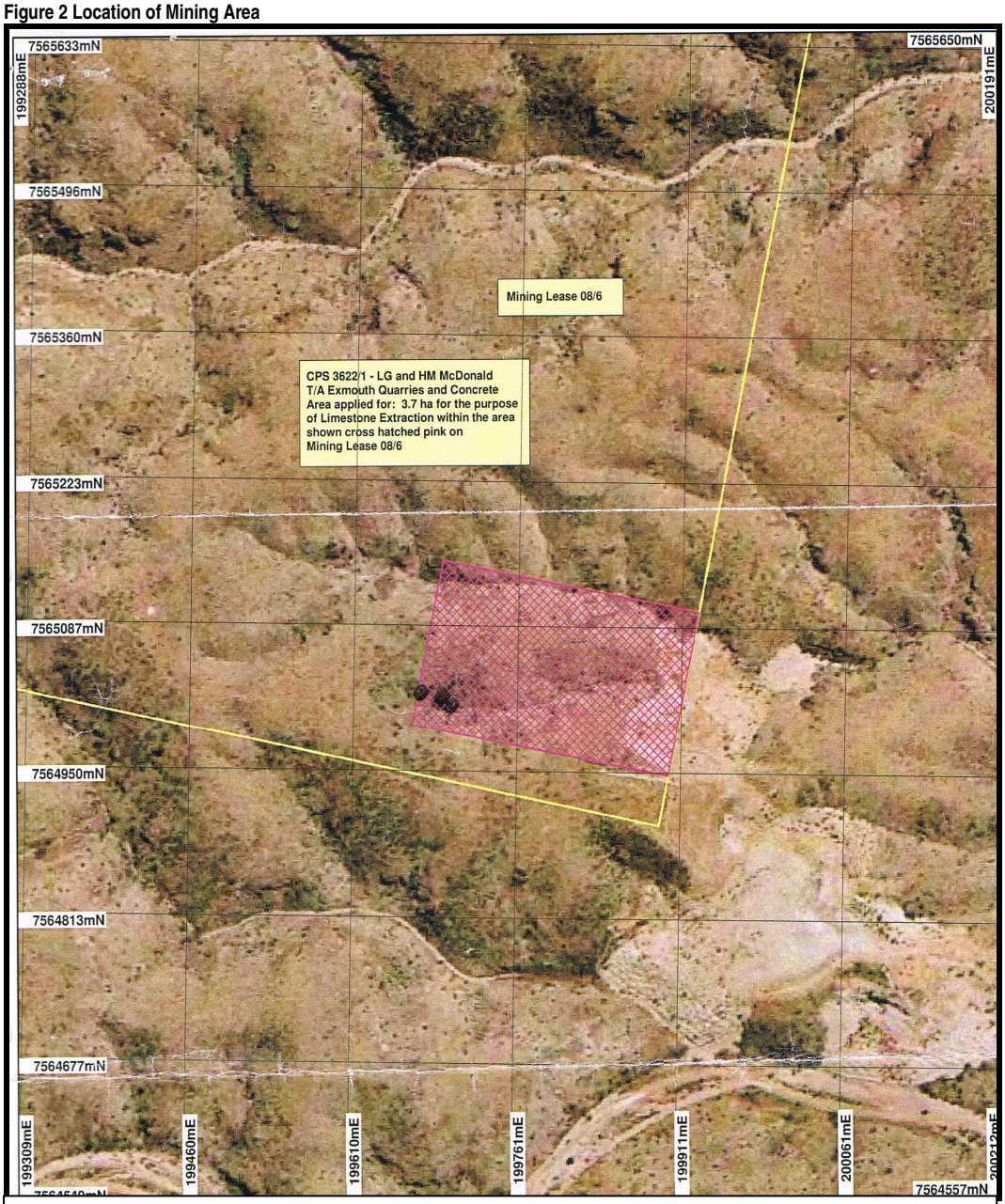
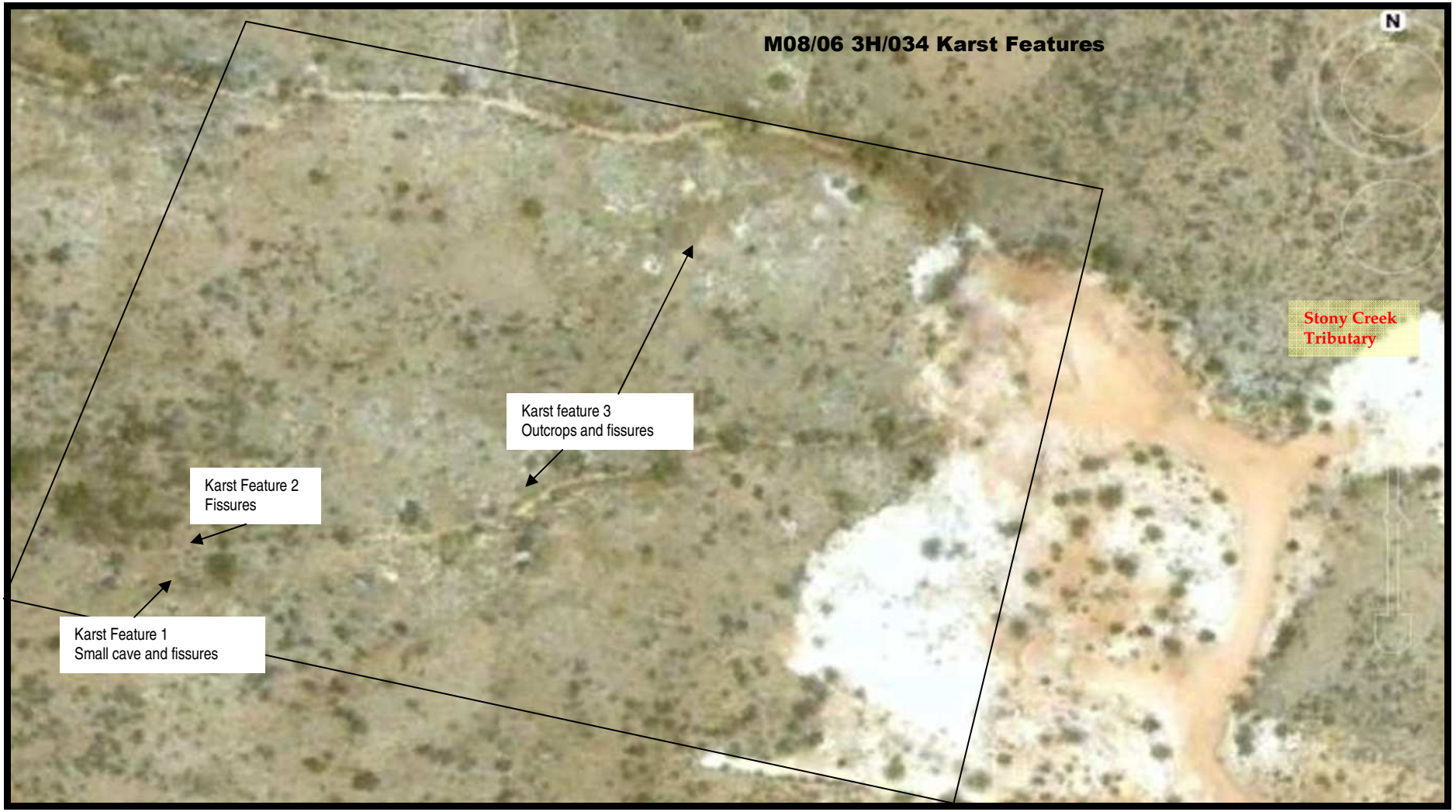


Figure 2 Location of Mining Area



Source: DMP Native vegetation Branch



Source Google

Figure 3 Karst features on site

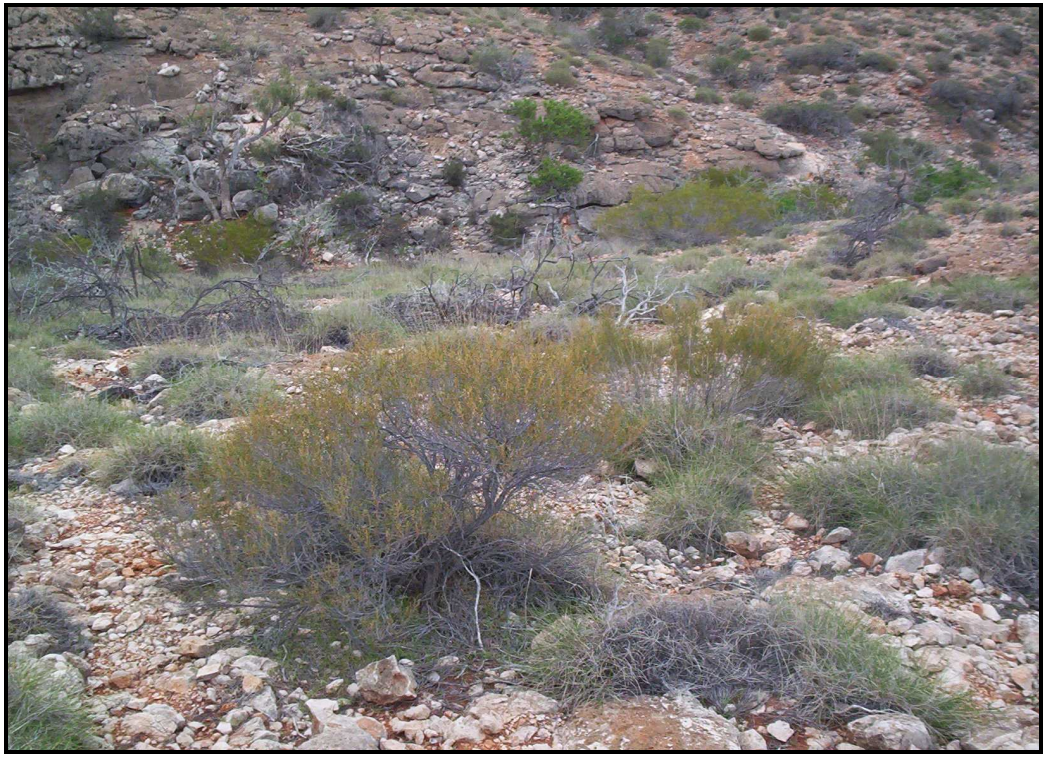


Figure 4 Karst Feature 1

Figure 5 Karst Feature 2

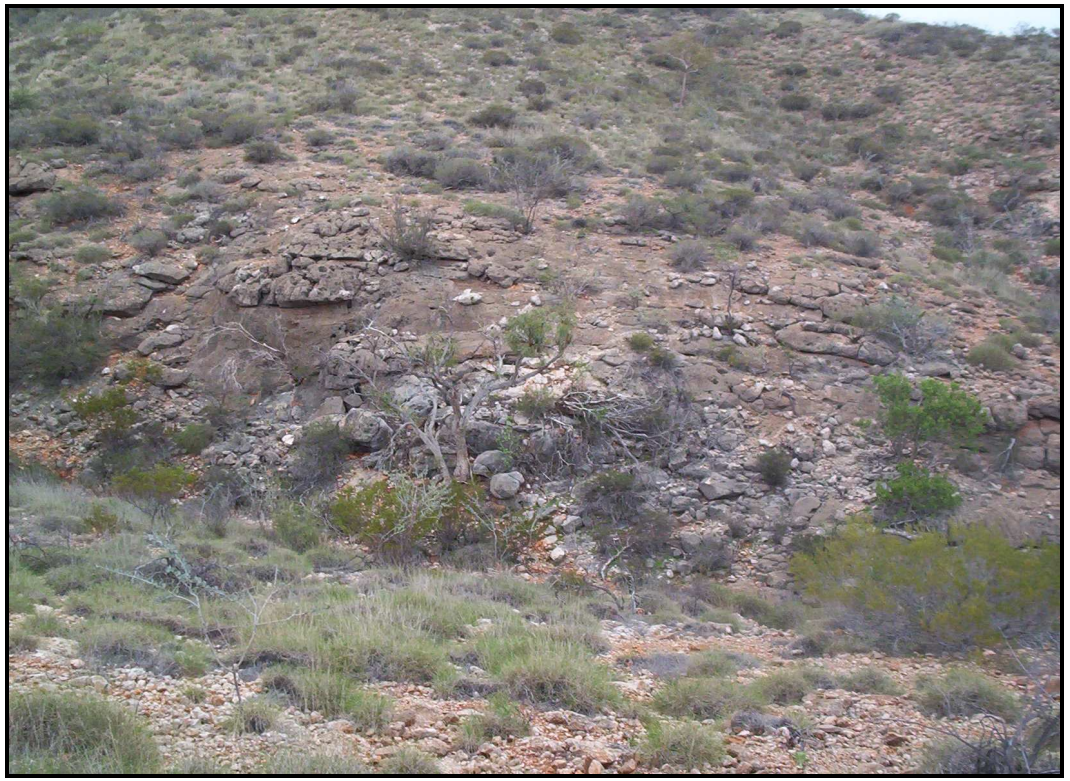


Figure 6 Karst feature 3