Samarinda high resolution stratigraphy programme

To provide an appropriate chronostratigraphic framework for studies in the Miocene of the Samarinda/Bontang area, a detailed set of samples have been collected for foraminiferal and palynological analysis which allows the magnetostratigraphic samples to be placed within a high resolution sequence stratigraphic framework that it is hoped can be tied to local sequence stratigraphic schemes, such as that of Morley et al 2006 based on the study of petroleum exploration wells. This has involved the collection of over 380 consecutively spaced samples tied to the magnetostratigraphic samples for foraminiferal, nannofossil and palynological analysis to be analysed by counterpart scientists at GRDC.

Samples have been collected sufficiently closely to permit each of the high resolution sequence stratigraphic packages encountered from the topmost Early Miocene to the base of the Middle Miocene to be thoroughly sampled in a manner which permits the biostratigraphic character of each systems tract of each depositional sequence to be assessed biostratigraphically.

Analysis of the sample set for foraminifera, nannofossils and palynology should allow the cross-checking of the magnetostatigraphic sampling program against age diagnostic foraminifera, nannofossils and palynomorphs. Analysis within a sequence stratigraphic framework should permit issues such as reworking of age-restricted microfossils to be resolved, which otherwise causes major problems in dating deltaic sediments from this area.

It will also permit placement of the carbonate lithologies, which form the main area of interest for this project but form less than one per cent of the total stratigraphic succession, to be placed within a clear stratigraphic, temporal and spatial perspective.

Personnel involved in this programme are:

Andri Perdana Putra, GRDC, foraminifera
Andi Rakhmat, GRDC palynology
Cibaj, Irfan, Total Indonesie, lithostratigraphy and sequence stratigraphy
Morley, Robert J, Palynova, advisor and sequence stratigraphy
Nathan Marshall, Utrecht, magnetostratigraphy
Wout Krijgsman, Utrecht, magnetostratigraphy

Analysis will be mainly by GRDC scientists, with foraminifera undertaken by Andri Perdana Putra and palynology by Andi Rakhmat.

The generalised stratigraphic succession for Kutei Basin is shown in Fig 1, with the white arrow approximately showing the extent of the section sampled for this study, which extends from upper slope deposition at the base in the Early

Miocene and part of the Middle Miocene (Bukit Pinang section, ‘Garage’ section, Hutanan and lower Rapak sections) through shelf edge carbonates represented by Batu Putih limestones (upper Rapak and Batu Putih sections), through to shelf clastics (Batu Putih and lower Sungei Kunjang sections) followed by pro-delta, delta front and distal delta plain clastics (upper Sungei Kunjang, ‘Cement Factory’ and ‘K.Bul’ sections). The lithologies marked in blue are carbonates, showing the very limited extent of carbonates in this area. The successions sampled are listed below from oldest to youngest.

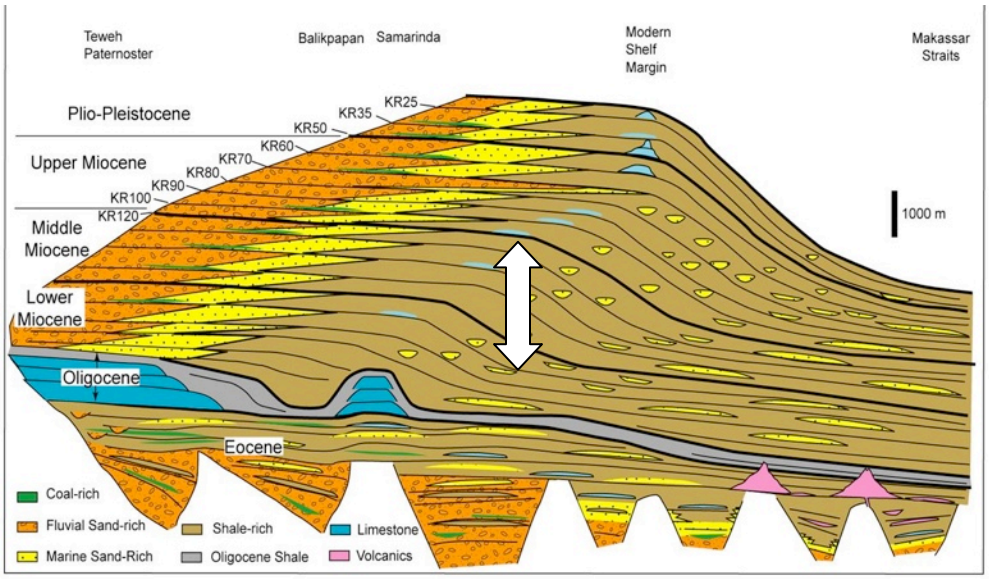

Fig 1. Generalised Kutei Basin profile showing stratigraphic succession sampled for this study.

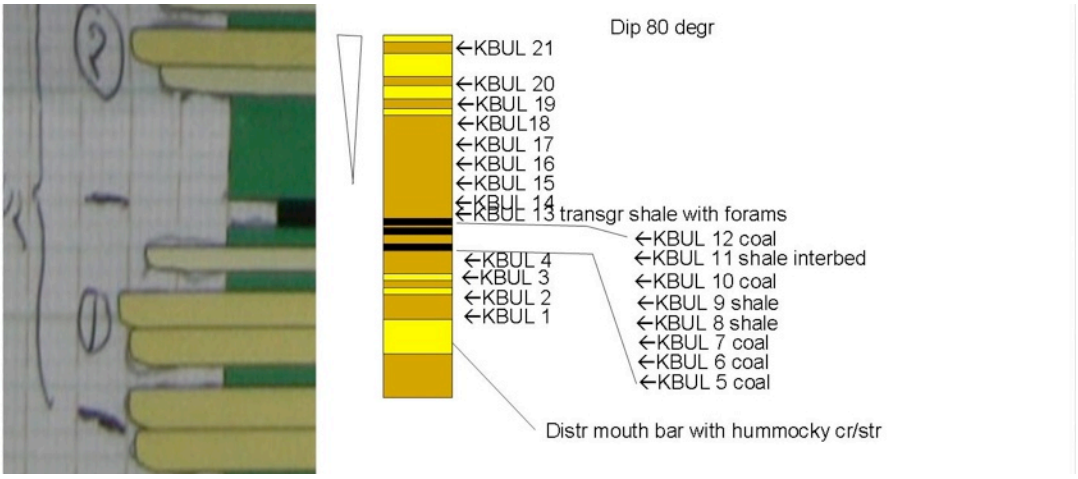

Fig 2 ‘K.Bul’ section, the youngest sampled, proximal to distal delta plain, age about 12 Ma, 21 samples collected.

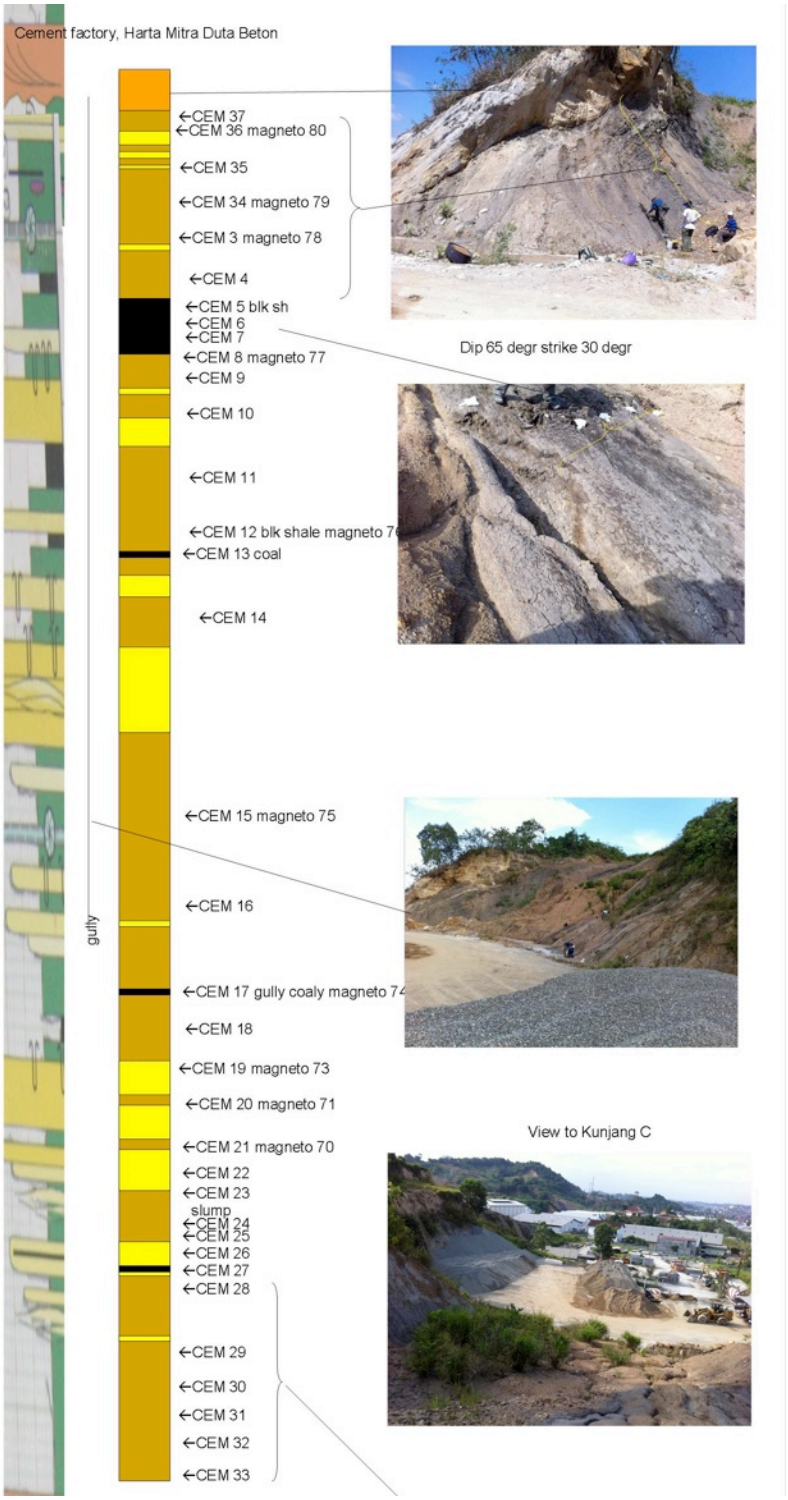

Fig 3 'Cement factory' section, mainly delta plain and delta front, age about 13 Ma, 34 samples collected

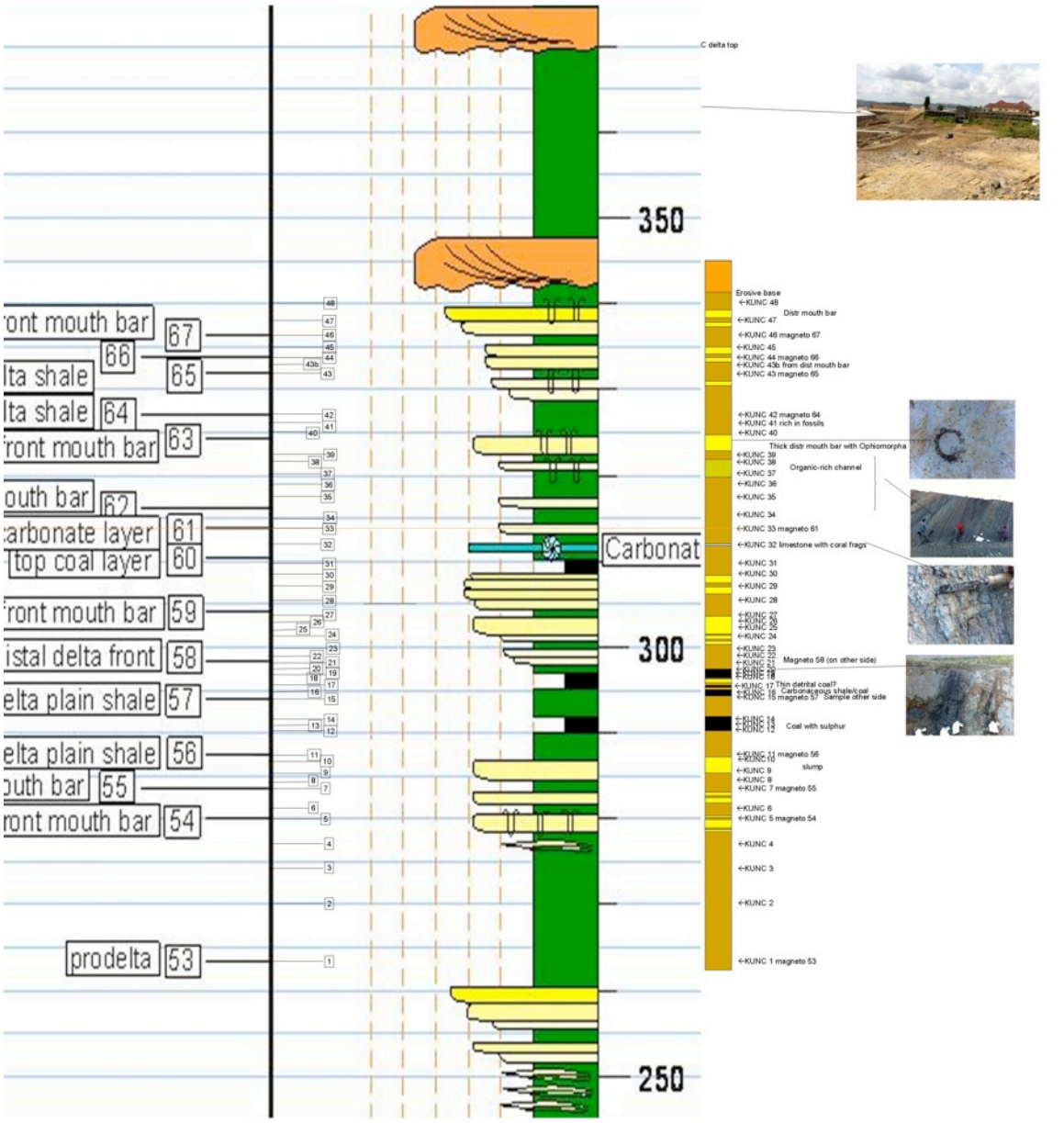

Fig 4. Upper Sungei Kunjang section, delta plain to delta front, age approximately 14 Ma, 48 samples collected

Lower Sungei Kunjang section (crab locality) not illustrated, delta front and pro-delta, age about 14.4 Ma, about 60 samples collected/

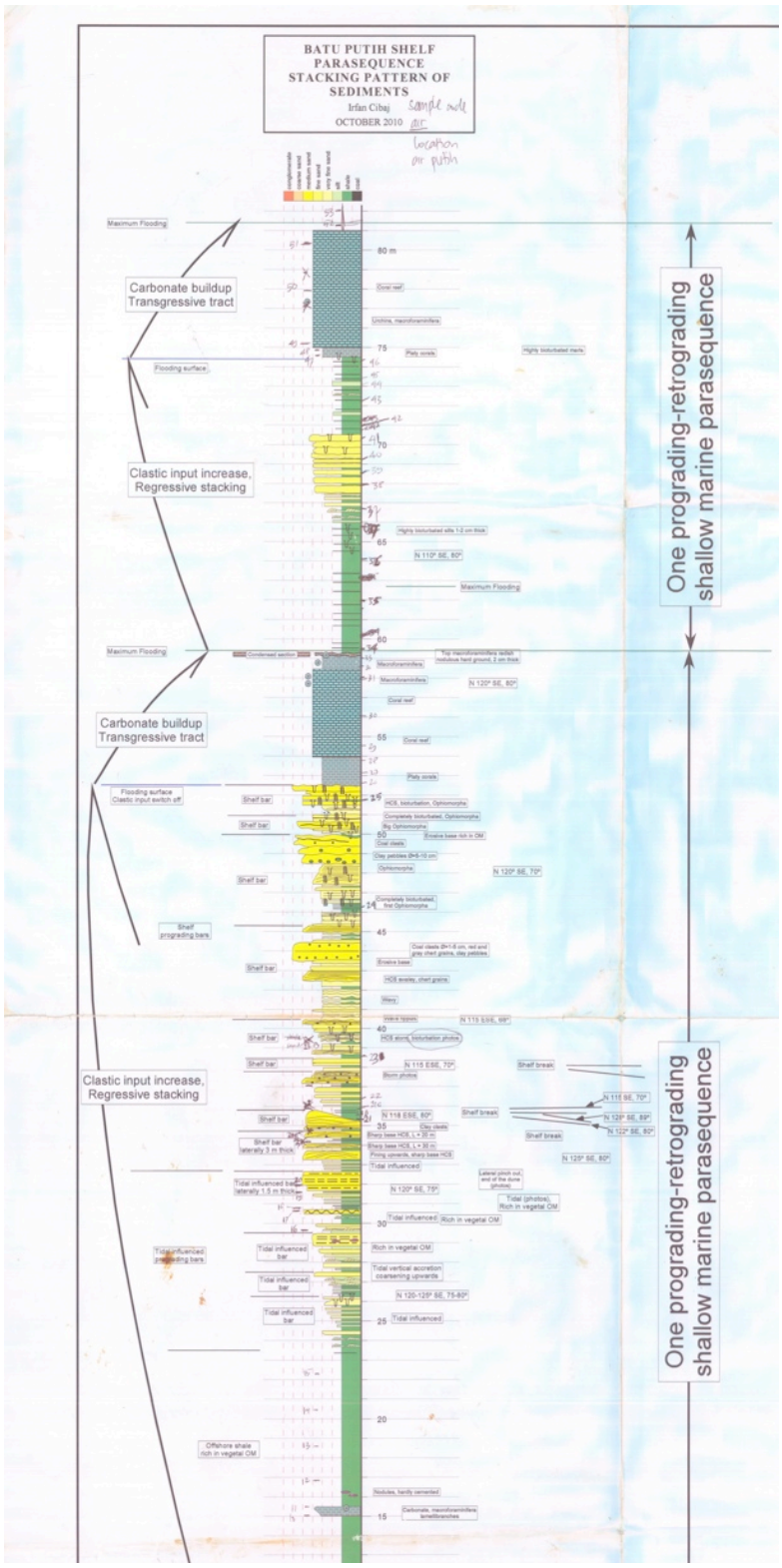

Fig 5 Batuh Putih section (in prep), pro delta, shelf and shelf edge carbonates, age about 14.8 Ma, 53 samples collected.

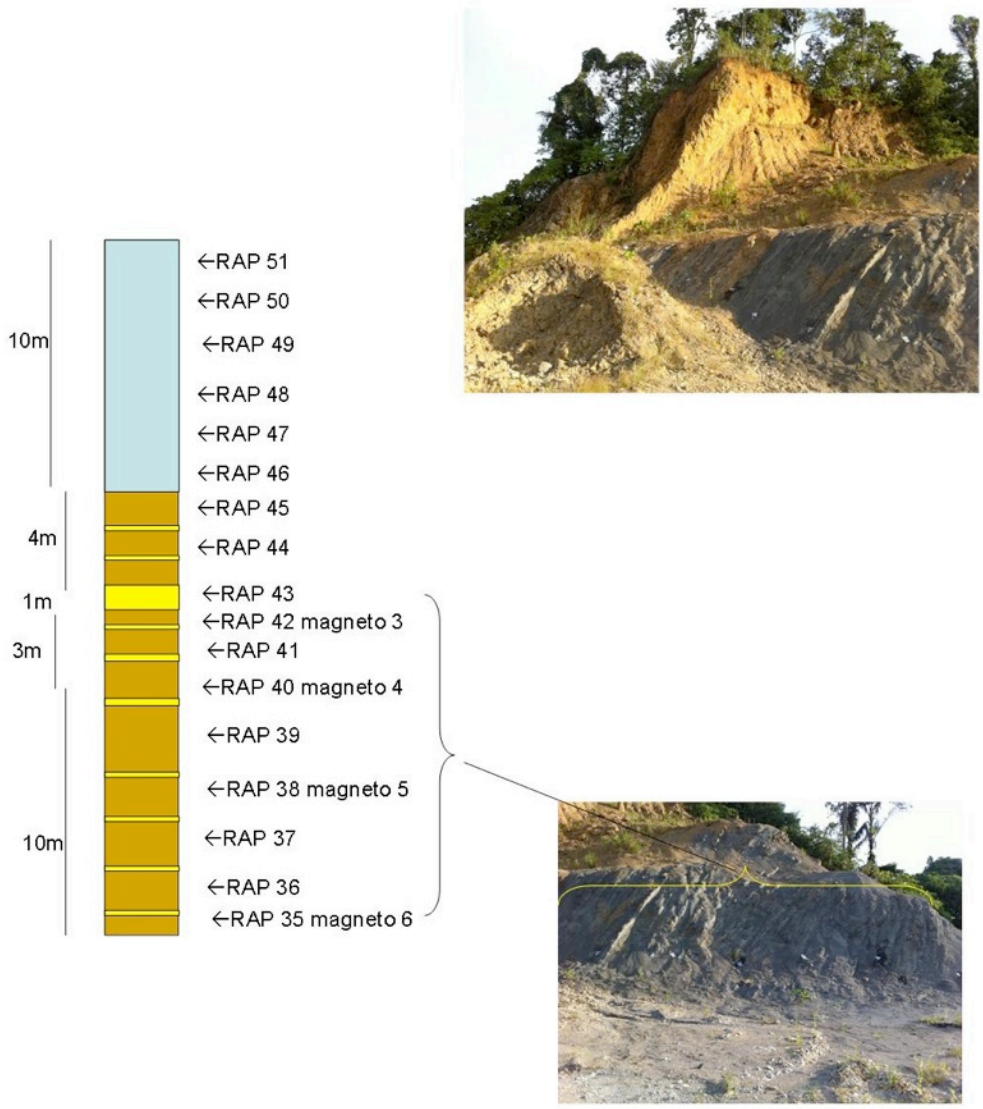

Fig 6 Upper Rapak section, shelf edge carbonates and clastics, age about 15.2 Ma

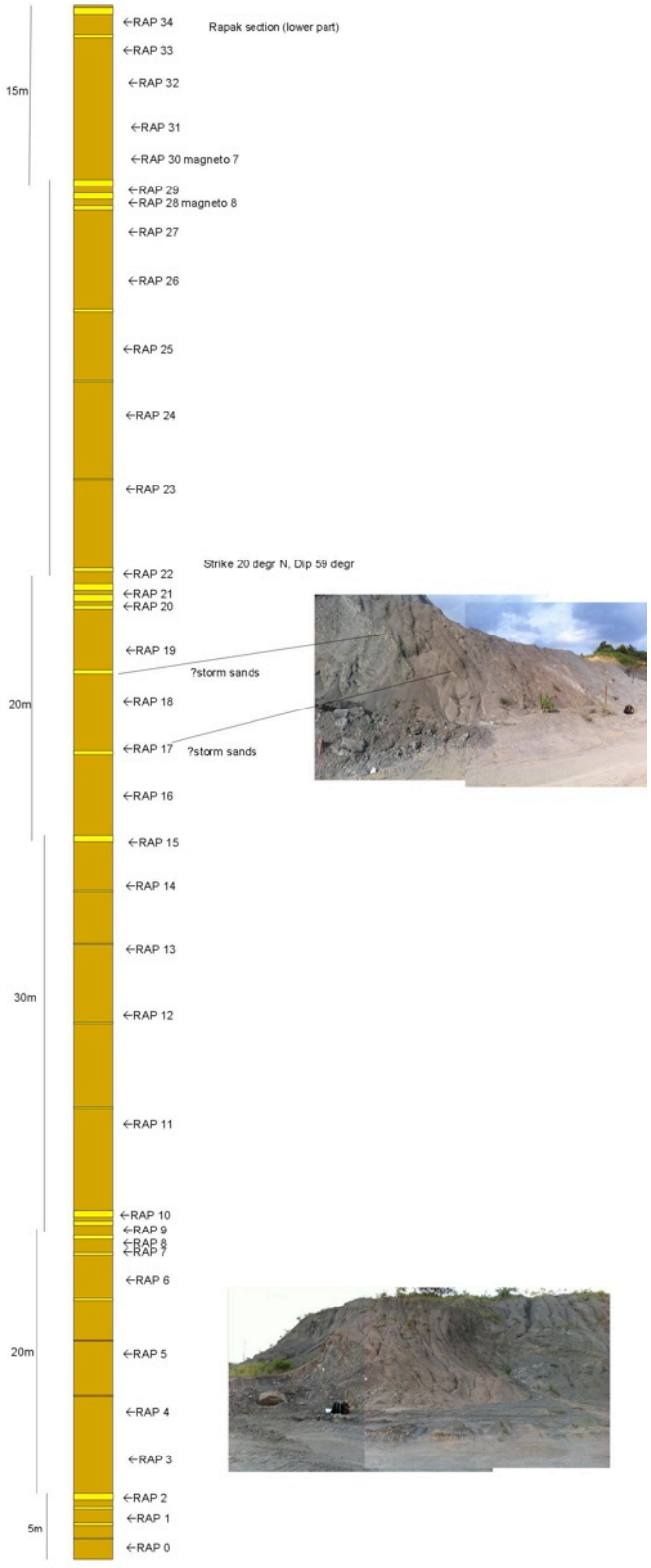

Fig 7, Lower Rapak section, upper slope deposits, for Rapak section 45 samples collected, age about 15.5 Ma.

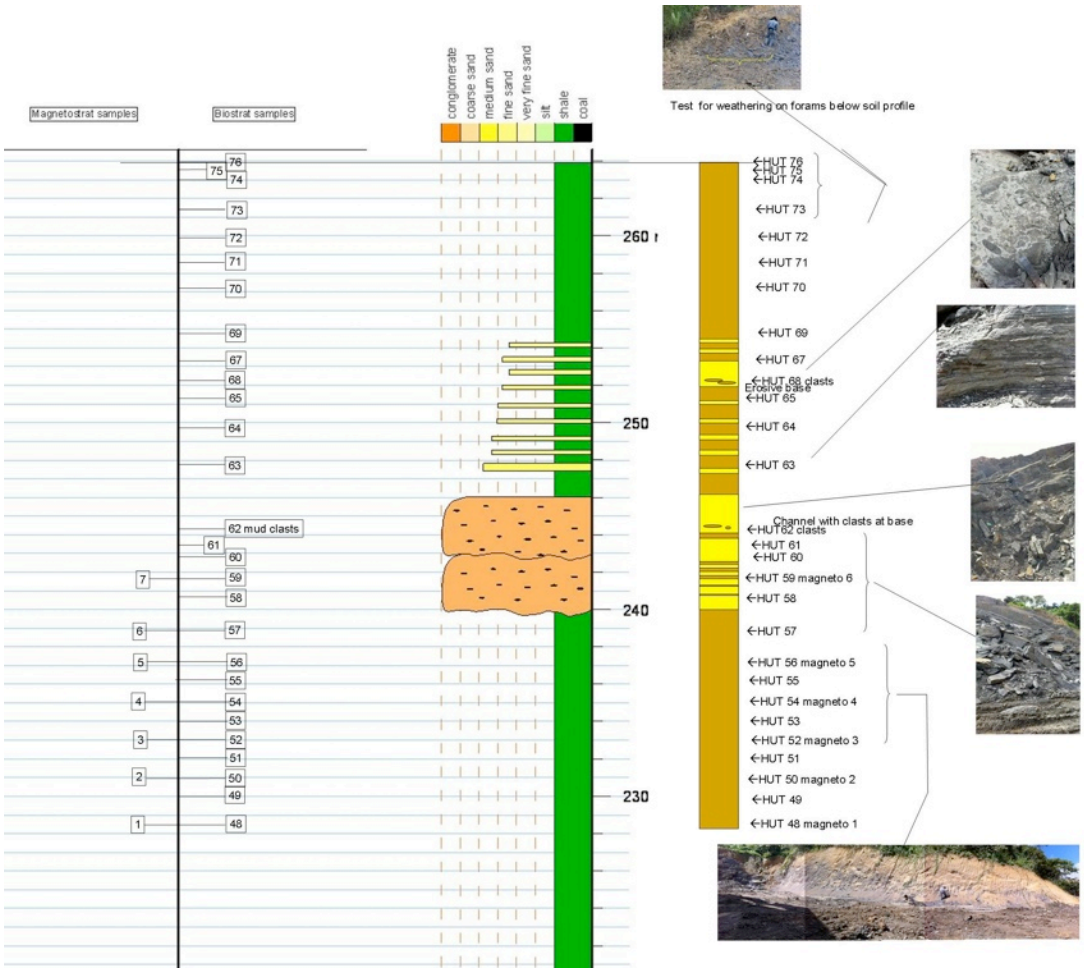

Fig 8 Upper Hutanan section, upper slope deposits, age about 15.8 Ma

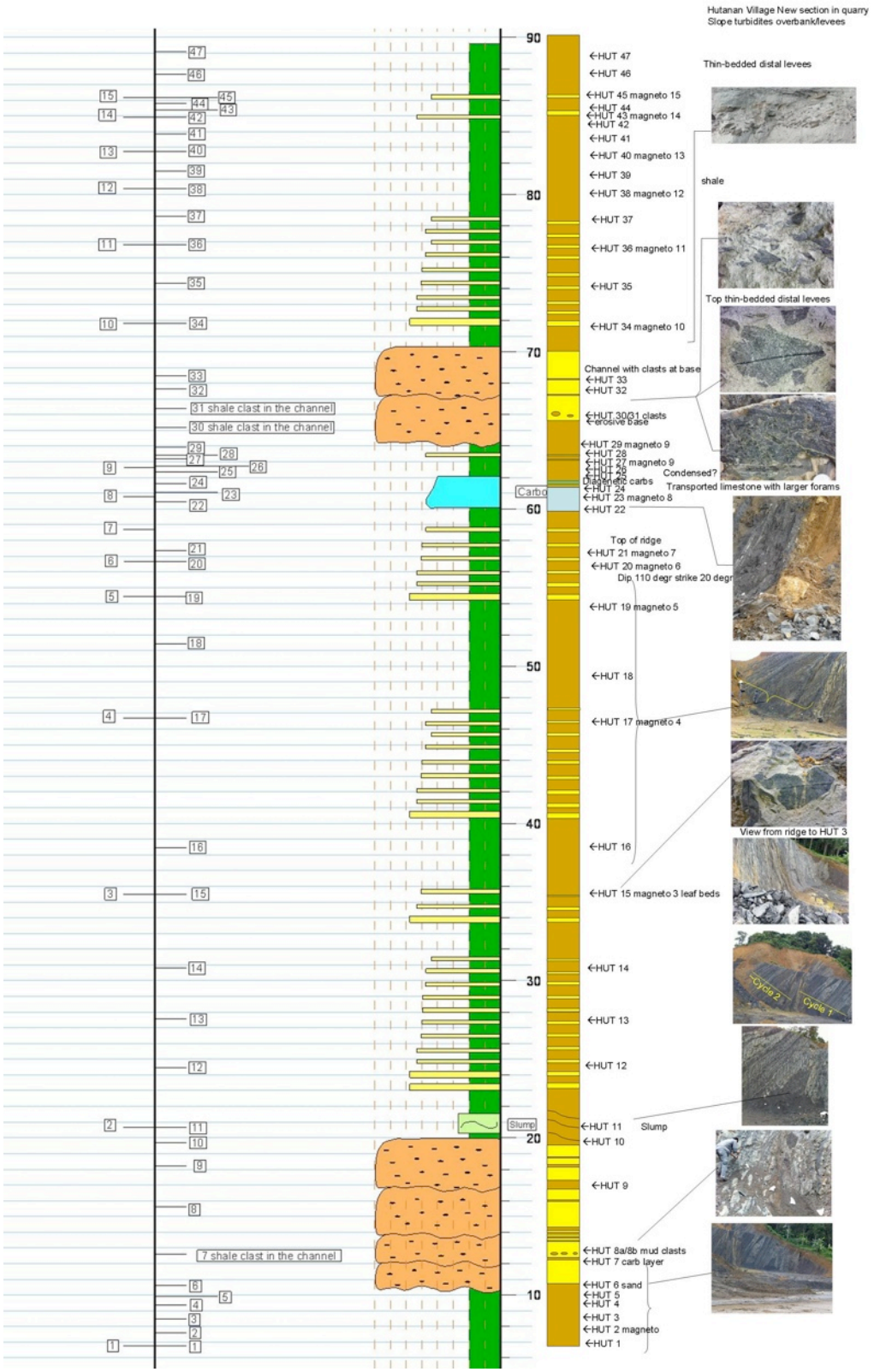

Fig 9 Lower Hutanan section, slope clastics and transported carbonates, age about 16.2 Ma, 73 samples collected from whole Hutanan section.

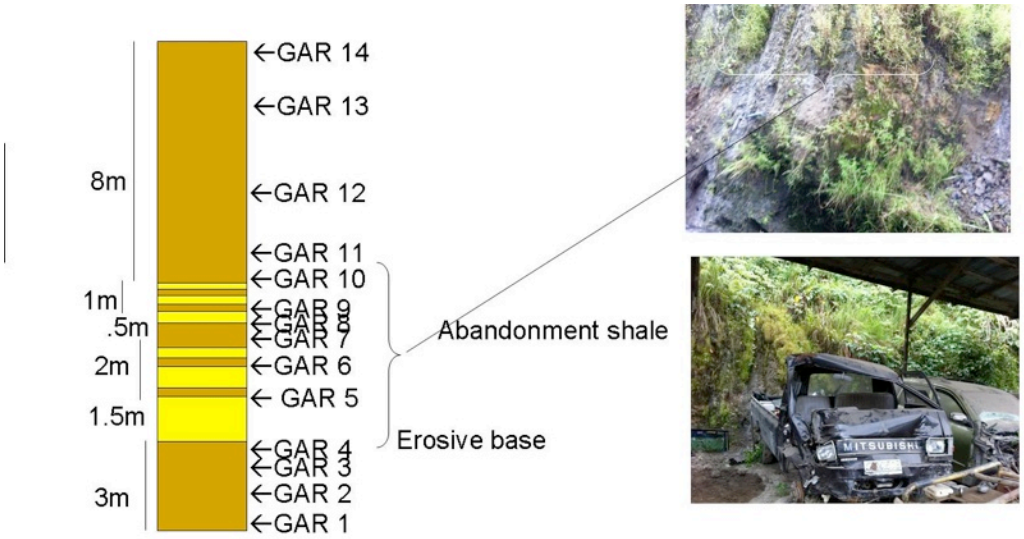

Fig 9, 'Garage' section, upper slope clastics, age about 16.5 Ma, 14 samples collected, Age about 16.5 Ma

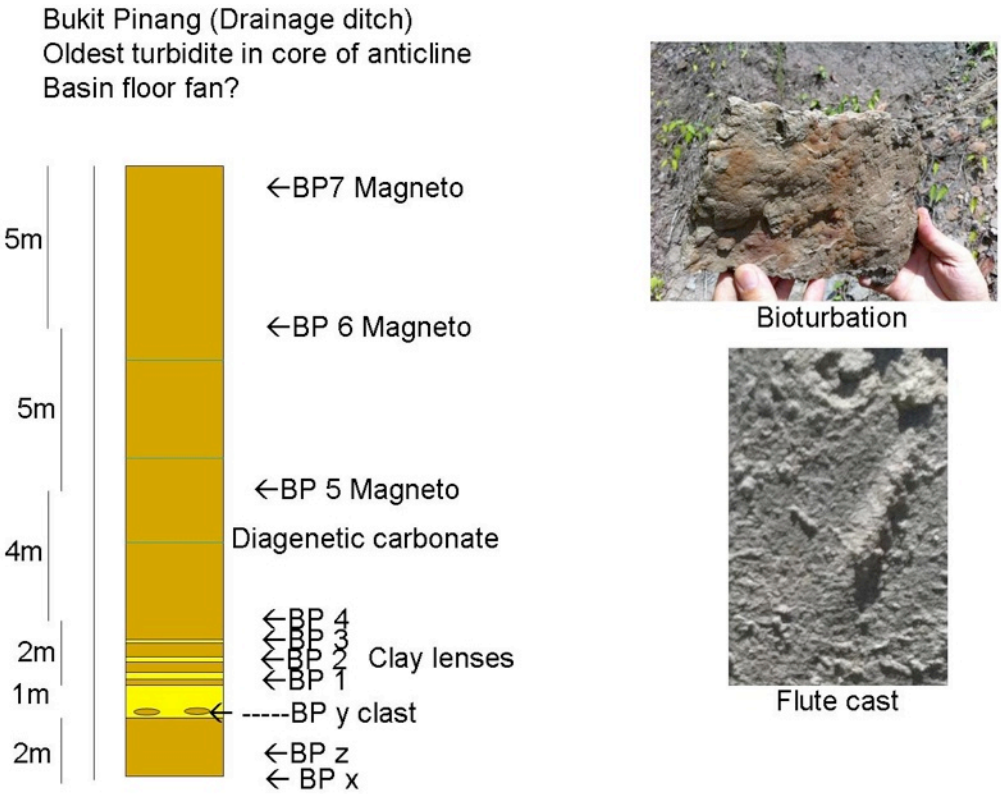

Fig 10 Bukit Pinang section, base of slope clastics/basin floor fan, age about 17 Ma, 14 samples collected.