

## APPLICATION: EXPORT PERMIT FOR COUNCIL FOR GEOSCIENCE

### Description of Material: CGP/1/44

A cast of a burrow infill (specimen number CGP/1/ 44 [previously numbered GSA 1/44]) in the collections of the Council for Geoscience (CGS) was collected on the farm Moerbeidal 648 in the Rouxville district (Free State) in November 1997. This specimen was collected as a loose block at the base of a hill consisting of red siltstones exposures of the lowermost Burgersdorp Formation at S30°33'23" E26°27'00". At the time of collection I noticed some bone preserved within the burrow-fill, but this was never exposed as it would require very delicate physical preparation.



### Reason for Export:

Prof Bruce Rubidge has been granted beamtime at the European Synchrotron Research Facility (ESRF) at Grenoble in France for the period 2-10 July 2014. This proposal is to scan specimen CGP 1/44 at the ESRF to identify the fossil animal preserved in the burrow infill structure, which is most probably a small cynodont therapsid. This is part of a larger long term research project of the ESI to scan burrow infills from the Karoo Supergroup in an effort to find evidence which can lead to an understanding of the palaeobiology of the burrow occupants.

### Motivation:

As only pieces of bone are exposed from the cast of GSA 1/44, it is not possible to determine at this stage how much of the animal is preserved but as scanning is non-destructive it provides a good mechanism to study the bones of animals preserved inside the burrow without destroying the burrow. In the past Rubidge and his team obtained very good results by scanning burrow casts at the ESRF and last year published a paper describing a remarkable occurrence of a therapsid and an amphibian preserved together in a burrow cast from the *Lystrosaurus* Assemblage Zone of the Beaufort Group. (FERNANDEZ, V., ABDALA, F., CARLSON, K. J., RUBIDGE, B. S., YATES, A., & TAFFOREAU, P. 2013. Synchrotron Reveals Early Triassic Odd Couple: Injured Amphibian and Aestivating Therapsid Share Burrow. *PLOS ONE*, 8(6), e64978.).

We fully support this effort to conduct further research on this CGS specimen and incorporate it into a broader palaeobiological; especially if it utilises a non-invasive technique.

The reserved beamtime is for the period 2-10 July, but the permit application is for the period 15 June to 30 December to give time to rescan the specimen if the scanning is not successful the first time round. As the specimen is heavy it will be sent by courier to Dr Vincent Fernandez who was a postdoctoral fellow at the ESI in 2012, and is now a member of staff at the ESRF in Grenoble.

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