



an agency of the  
Department of Arts and Culture

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CaseID: 17349

Date: Wednesday November 03, 2021

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## Letter

### In terms of Section 32(19) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Kathleen Dollman  
European Synchrotron Radiation Facility

**The focus of this research is to non-destructively investigate the dental microstructures of the very earliest occurring fossil crocodylians and their closest relatives, rausuchians. Fossil crocodylians were an extremely diverse group of animals, and vastly different from the sedentary semi-aquatic crocodiles that we know today. These fossil crocodylians had a great diversity of ecologies, including a terrestrial lifestyle, hyper-carnivory, herbivory and insectivory. Dental microstructures such as surface dental complexity, enamel-dentin junction thickness variances, dental histology can tell us a lot about the ecology and lifestyles of fossil vertebrates. Dental research has been very promising in Mammalia and Dinosauria and has proven important for investigating taxonomy, physiology, phylogenetics and diet in these clades. However, this has yet to be investigated in fossil crocodylians. South Africa has one of the best fossil records of the very earliest crocodylians globally, and the ESI holds many of these specimens in its Karoo collections. Given the rarity of crocodylian fossils, the dental microstructures and histology must be investigated non-destructively, and synchrotron x-rays are able to penetrate dense fossil material and resolve structures at a submicron level. This presents an opportunity to investigate novel structures in fossil crocodylians.**

Dear Dr Choiniere and Dr Dollman,

Thank you for your application to temporarily export eight crocodylian cranial fragments from the Karoo for synchrotron analysis at the European Synchrotron and Radiation Facility in Grenoble, France.

SAHRA has reviewed the application and has decided to approve it.

We wish you every success with this project.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Our Ref:



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Ragna Redelstorff, PhD  
Heritage Officer  
South African Heritage Resources Agency

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Phillip Hine  
Manager: Archaeology, Palaeontology and Meteorites Unit  
South African Heritage Resources Agency

**ADMIN:**

Direct URL to case: <https://sahris.sahra.org.za/node/587414>

**Terms & Conditions:**

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.