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## Zircon Geochronology of Glendon Formation Bentonite, Rankin Trails Park, Brandon, Mississippi

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GCAGS Explore & Discover Article #00357\*

[http://www.gcags.org/exploreanddiscover/2018/00357\\_lafleur\\_et\\_al.pdf](http://www.gcags.org/exploreanddiscover/2018/00357_lafleur_et_al.pdf)

Posted September 29, 2018.

\* Article based on a full paper published in the *GCAGS Transactions* (see footnote reference below), which is available as part of the entire 2018 *GCAGS Transactions* volume via the GCAGS Bookstore at the Bureau of Economic Geology ([www.beg.utexas.edu](http://www.beg.utexas.edu)) or as an individual document via AAPG Datapages, Inc. ([www.datapages.com](http://www.datapages.com)), and delivered as a poster presentation at the 68th Annual GCAGS Convention and 65th Annual GCSSEPM Meeting in Shreveport, Louisiana, September 30–October 2, 2018.

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### ABSTRACT

Zircons extracted from a 5 kg sample of bentonite sediment collected from the base of the Glendon Formation at the Rankin Trails and Amphitheater Park in Brandon, Mississippi, were dated by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) at Texas A&M University, College Station. Dating reveals a mixed origin for zircons in bentonite at this site. Zircon grains have two distinct morphologies: a majority have rounded shapes and a pink to purple coloration and a minority of zircons have prismatic form and are transparent. Rounded grains are detrital zircons having dates that cluster mostly at 900–1300 Ma and at ~400 Ma. Transparent, prismatic zircons show no abrasion and have dates of 30–35 Ma. The two older clusters correspond to the ages of regional tectonic events, the Grenville Orogeny and the Taconic Orogeny, indicating erosion of crystalline basement rock and transport as detrital zircons to Brandon, Mississippi. The 30–35 Ma prismatic zircons correspond with dates of volcanic ash of the Eocene-Oligocene ignimbrite flareup that occurred along the southwest margin of North America, which is the source of many Eocene-Oligocene volcanic ash beds deposited across the Gulf of Mexico Coastal Plain. The older zircons occur within sandy burrow fills present in the clay bentonite, introduced into the bentonite by burrowing organisms moving sand from the underlying Marianna Formation. The presence of 30–35 Ma prismatic, unabraded zircons typical of volcanic ash is evidence that the bentonite is an alteration product of volcanic ash, which conflicts with a recent suggestion that the Glendon Formation bentonite originated as a weathering product of glauconite-rich sediment.