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Facies analysis of an Eocene to Lower Miocene phreatomagmatic volcanic field in the Andes of Central Chile

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The Abanico Formation represents the products of the Eocene-Lower Miocene syn-extensional volcanism in the Andean range. Here we present the first evidences of phreatomagmatic volcanism within that period in the cordillera of central Chile. At least six maar structures, aligned EW and NS, crop out in the El Manzano area, located *ca.* 50 km SE of Santiago. The phreatomagmatic rocks that form the maars correspond to massive medium-to-coarse grained pyroclastic breccias, both lithic and pumice-rich, surrounded by fine-to-medium grained lapilli tuffs and ash tuffs with variable dips from gentle (<20°) to very steep (72° a 90°), locally with concentric distribution. Several dikes, deformed and mixed within the pyroclastic rocks filling the diatreme conduits have also been identified, probably associated to the last-stage magmatism of the feeders of the phreatomagmatic explosions. A detailed volcanic facies model both of the maar field as well as the volcaniclastic country rock was develop to better understand the distribution and geometry of the maar-diatreme structures. This facies analysis includes massive diatreme breccias, stratified conduit edge tuffs, upper cross-stratified tuffs and extra-maar finely laminated tuffs. The facies map shows the interpreted original geometry as well as the distribution of today's preserved outcrops, helping to understand both the initial geometry as well as its context in the regional geological map. These maar structures are the evidence that phreatomagmatic volcanism may not have been recognised in the Cenozoic volcanic units of the Andes and may be of much more ubiquitous distribution.