GEOTHERMAL RECONNAISSACE STUDY AT AZUFRAL VOLCANO

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Azufral volcano, one of the highest priority targets for the geothermal exploration in Colombia, is a recent (Tertiary) stratovolcano of extended and persistent volcanic activity, with evidence of hydrothermal activity and complete magma differentiation. Its summit consists of a caldera structure which includes a lake (Laguna Verde) and a dome complex of rhyodacitic composition. The latest eruptive event created a dome, which presents hydrothermal alteration, fumaroles and phreatic eruption craters, which suggest the existence of an active heat source. Fluid discharges of the hidrothermal system are found in the steam vents within the crater and in about ten hot springs. The gas composition of one of the steam vents indicates a hydrothermal origin. Some of the hot springs located between 3 and 11 km from the summit towards the West and the Southeast flanks, show deep fluid contribution. Acid sulphate waters discharge to Laguna Verde. Bicarbonate waters are also found at about 10-11 km from the summit, towards the South flank. From aqueous and gas geothermometers, the temperature at the reservoir ranges from 200° to 250°C. A preliminary geochemical approach is consistent with the general model for hydrothermal systems related to stratovolcanoes, with a boiling process occurring towards the West side of the crater and an outflow to the Southeast flank, where the hot springs exhibit the highest contents in conservative aqueous components. This paper is a compilation and a review of the existing geological and geochemical information about the Azufral volcano geothermal system.