

**Potassic olivine basalt of the Alverson Formation, Superstition Mountain,
Imperial County, California**

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Abstract: Miocene volcanic rocks interbedded with nonmarine fluvial deposits are present at scattered localities in the western Salton Trough region. At Superstition Mountain the volcanic rocks are mapped as Alverson Formation and comprise an approximately 70 meter thick section of ~5-7 separate olivine basalt flows interbedded with the Split Mountain Formation. Individual flows are massive and platy fractured in the lower part with strongly amygdaloidal flow tops. Samples were collected from the basal parts of all of the flows for petrographic and whole rock X-ray fluorescence determination of major and trace element concentrations. The rocks are porphyritic olivine basalt with euhedral olivine microphenocrysts and holocrystalline plagioclase-pyroxene-Fe-Ti oxide groundmass. The alteration of the rocks is quite variable from very fresh rock with virtually 100% fresh olivine to rocks where the olivine has been completely replaced by secondary minerals. These rocks are mildly alkalic high potassic basalts that could fall into a rare series of basalt called shoshonite. These highly potassic rocks may reflect unusual mantle compositions and the compositions may speak to tectonic plate reorganization and the establishment of the San Andreas fault system during the Miocene.