# Pima County Regional Flood Control District Monthly Brown Bag Series

## A Hydrochemical Modeling Study to Evaluate Potential Regional and Local Flowpaths to Surface Water Base Flow in Lower Cienega Creek and Davidson Canyon, Southeastern Arizona

**Alyssa G. Kirk**
Recent UA Graduate/Groundwater Hydrologist, Montgomery & Associates

Cienega Creek contains critical habitat for plants and wildlife including threatened and endangered species and has been designated as an "Outstanding Water" by the State of Arizona. With limited surface water and various demands for water in the region, the presence of perennial surface water may be impacted by reduced water in the watershed. Within the groundwater basin, potential impacts include reduced precipitation and increased evaporation related to climate change as well as increased groundwater pumping from development and/or related to potential mining activities. Understanding where surface water is sourced can help inform water management strategies. Potential sources include regional groundwater with longer flowpaths and residence times, and locally recharged groundwater, which is sustained by recent precipitation.

This study uses water chemistry data from regional groundwater, alluvial groundwater, recent precipitation, and surface water base flow to model the geochemical evolution of potential source waters to the resulting surface water in perennial reaches in the Lower Cienega Creek and Davidson Canyon watersheds. Geochemical modeling, recently collected data, and previous studies indicate that perennial flow in Lower Cienega Creek is primarily sustained by deeper, older, regionally recharged groundwater (about 71-84%) with contributions from Davidson Canyon below the confluence (about 42%). Davidson Canyon surface flow is primarily sourced from shallow alluvial groundwater (about 55-92%) that has been more recently recharged by local precipitation, with some contribution (about 8-45%) from older, regional groundwater.

PIMA COUNTY
FLOOD CONTROL

**Wednesday, August 12, 2020: 12:00 - 1:00 PM**
**Online via Teams**