



TOWN OF PATAGONIA

P.O. BOX 767

PATAGONIA, AZ 85624

Andrea Wood
Mayor

August 12, 2020

Coronado National Forest Supervisor Kerwin Dewberry

310 North Congress Street

Tucson, AZ 85701

RE: Request for Municipal Supply Watershed Groundwater Study

Greetings Supervisor Kerwin Dewberry:

The Town of Patagonia is situated in a semi-arid Chihuahuan Desert Grassland environment. The Town gets its water from the Sonoita Creek and tributary Harshaw Creek drainages. These drainages are recognized officially by the US Forest Service as a Municipal Watershed.

In a 2007 study posted in the journal Science (http://ocp.ldeo.columbia.edu/res/div/ocp/pub/seager/Seager_et_al_transition_2007.pdf), states that much of the Southwest region has been in a severe drought since 2000, which the study's analysis of computer climate models shows as the beginning of a long dry period. The study predicted a permanent drought by 2050 throughout the Southwest — one of the fastest growing regions in the nation. Many other more recent climate change studies and models also predict warmer and drier conditions for our arid southwest US region.

The Patagonia Mountains currently have multiple mining company proposals within the Patagonia Mountains. The Town of Patagonia is greatly concerned about the potential cumulative impacts from the multiple mining activities that are on-going and proposed. Mining activities in the Patagonia Mountains have a well documented history of water contamination problems within the Town's Municipal Watershed. Water is the one thing that all life forms can't live without. The quality and quantity of this community's water supply are of significant concern.

Please conduct a comprehensive surface and ground water study which should be paid for by the companies seeking to perform any mine-related activity (including exploratory drilling) in the Harshaw Creek, Redrock Canyon, Middle Sonoita Creek, Big Casa Blanca Canyon, and Upper Sonoita Creek watersheds. We ask that the study include:

- Conceptual finite element (FeFlow) and finite difference 3-D (Modflow) groundwater models
- Flow rate and contaminate fate and transport analysis



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- A Three-Dimensional Hydrogeologic Model, including an aeromagnetic geologic survey, similar to the study done for Rio Rico and Nogales at <https://pubs.er.usgs.gov/publication/sir20185062>
- A full geographic coverage of the contributing watershed's groundwater basins, including updated geologic mapping of all contributing media formations (Aerial Electromagnetic Mapping by USGS recommended - Mark W. Bultman, et al)
- Groundwater level monitoring in Town of Patagonia wells and surrounding wells
- Streamflow water quality and quantity monitoring in and "around" Town of Patagonia
- Isotope study to confirm sources of Town of Patagonia's and Sonoita Creek's water (Dr Jennifer McIntosh proposal)
- Full geographic coverage of contributing watersheds groundwater basin, including updated geologic mapping of all contributing media formations (Aerial electromagnetic mapping by USGS - Mark W Bultman, et al)
- Heavy metals baseline data collection with "during" and "post-closure" monitoring

The Town of Patagonia asks to be included in the decision making on the contractor/ hydrologist chosen for this work; our preference is that the USGS conduct this study. And the comprehensive surface and groundwater study should be conducted before any water dependent industrial activities begin. The 1897 Organic Act established the care and management of forests to secure "favorable conditions of water flow" as a principle purpose of the Forest Service. Thank you for your assistance in this vital project to protect the water quality and quantity within this Forest Service municipal watershed.

Andrea Wood
Mayor, Town of Patagonia

CC: Coronado Forest Service Watershed Manager Jennifer Varin: jvarin@fs.fed.us
Attachment: Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America