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MICROBIAL CHALLENGES TO EXTENDING USES OF RIO GRANDE RIVER WATER

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Despite its critical role in agriculture and potable water supply for the region, few studies have evaluated the microbial quality of the Rio Grande River, especially for the parasites *Cryptosporidium* and *Giardia*. *Cryptosporidium* and *Giardia* cause diarrheal illness and have been responsible for numerous waterborne and foodborne disease outbreaks. Cryptosporidiosis, the disease caused by *Cryptosporidium*, may be fatal in people with weakened immune systems and there is currently no effective treatment for the disease. During the irrigation season, water is released from upstream reservoirs and the river water is used by El Paso as a potable supply. During the non-irrigation season (October through February), river flows are comprised of agricultural return flows and wastewater treatment plant effluents. Due to recent drought conditions in the region, winter return flows in the El Paso area are largely wastewater effluents. Our monitoring results revealed that winter return flows contain 5 and 100 times higher average levels of *Cryptosporidium* and *Giardia*, respectively, than irrigation season river water. Recently, research has been proposed to evaluate the use of winter return flows for potable supply and irrigation. Conventional filtration and disinfection followed by nanofiltration or reverse osmosis have been proposed for treatment of the water to remove total dissolved solids and microorganisms. Besides *Cryptosporidium* and *Giardia*, viruses may also be present in wastewater effluents. Therefore, in addition to chemical quality issues, these microbial water quality challenges must be overcome before this underutilized water resource can be put to beneficial use.

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