



Measurement of Groundwater Salinity for Selected Production Wells, Island of Saipan, CNMI



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Groundwater resources of Saipan, Northern Marianas Islands, provide a majority of the public drinking supply. Fresh water pumped from the basal lens is replenished continuously by rainfall. Precipitation percolates through the unsaturated limestone host unit to reach the upper levels of the fresh water aquifer. The aquifer supplies potable water at several well fields. Some of these fields have historically shown elevated salinity (measured as chloride ion) as a result of high pumping rates that exceed the recharge rates of the reservoir, very deep pump placement, and proximity to the transition zone between the fresh and saltwater layers. This water quality problem has been addressed by past researchers (Van der Brug, 1985, Carruth, 2003); however, current information has not been compiled in recent years. While the USEPA recommended concentration for chlorides is 250 mg/L (EPA, 1986) measurements from some wells have exceeded 2,000 mg/L. Monitoring for chlorides is required and performed by CUC on a quarterly basis, for all wells.

Recent changes in island population (a significant decrease) and an increase in utilities costs have also resulted in lower water consumption over the last five years.

The project will be conducted in two parts. The first task is compilation of historical salinity data from selected wells. The data source is the CUC Water Quality Laboratory records. A period of 2009 through 2013 is considered for this data compilation activity.

The second task consists of frequent, scheduled collection of groundwater data (salinity measurements by conductivity and chloride argentometric quantification) of selected wells throughout 2014. This work will produce a current record of salinity variation in correlation with pumping rates and precipitation. Monthly pumping rate records for the selected wells will also be collected from CUC Water operations.



Production Well in Saipan