



FY 2018 Budget Recommendations for the Wastewater Reclamation Division

Prepared by Steve Parabolici

Priority 1: Professional services for a consultant to assist the County WWRD in optimizing biological nutrient removal at the Kihei WWRF. (This service could also be extended to the Kahului WWRF).

Discussion: A contract would be issued to a qualified consultant who has experience in Biological Nutrient Removal (BNR) (such as CH2MHill, Brown & Caldwell, HDR etc.) to evaluate the Kihei WWRF's BNR system and to create a plan to optimize its operation. A goal of reducing total nitrogen in the facility's final effluent to between 5 and 7 mg/L should be established. The consultant should also be tasked with evaluating the feasibility of implementing Enhanced Nutrient Removal (ENR) at the facility that can achieve total nitrogen levels of less than 3 mg/L.

Justification: The Kihei WWRF's effluent total nitrogen is typically 10 mg/L or greater and elevated nitrogen levels have been detected in the injection well plume in the coastal waters off of Kalama and Cove Parks. The WWRD has already employed this strategy in the past (2013-2014) at the Lahaina WWRF where it hired CH2MHill to assist with the optimization of the BNR system.

Estimated Cost: \$50,000 - \$75,000

Priority 2: Design and install a permanent piping connection from the Kihei WWRF UV channels to the injection well system. **NOTE: The WWRD may already have developed a plan to complete this item.**

Discussion: A permanent piping connection will allow the Kihei WWRF to more efficiently disinfect all of the effluent that is disposed into its injection wells. It will also result in a higher quality effluent injected than the current method allows. The current method being utilized to deliver UV disinfected effluent to the injection wells is to pump all of the UV treated effluent to the covered R-1 holding pond and then allow the holding pond to overflow to the injection wells.

Justification: Utilizing a permanent piping system is a better alternative than the current method for three reasons: 1) The covered holding pond has never been cleaned since it was lined and covered almost 20 years ago. Solids have accumulated in the pond over time and it is likely that some of these solids are being carried in the overflow to the injection wells. 2) Excess electricity is being used to pump all of the effluent to the holding pond. A permanent piping system would allow the UV disinfected effluent to flow from the UV channels by gravity to the injection wells thereby resulting in energy savings. 3) If the pumps that transfer the UV disinfected effluent to the holding pond fail, the UV channel will be flooded. This could result in extensive damage to the UV electrical system.

Estimated Cost: \$750,000

RECEIVED AT BF MEETING ON 5/1/17
Recd from Council member King

Priority 3: A Preliminary Engineering Report (PER) to extend the R-1 recycled water transmission system to Wailea.

Discussion: Extending the WWRD's R-1 distribution system to Wailea will greatly reduce the use of injection wells for effluent disposal at the Kihei WWRF. It could also potentially save up to 1 million gallons of potable water that is currently used to irrigate resort landscapes. The South Maui Recycled Water Verification Study completed in 2009 by the WWRD estimated the cost of this extension at approximately \$21 million.

Justification: The aforementioned study is now 8 years old and it would be advisable for the DEM/WWRD to have a qualified consultant take a closer look at what infrastructure is required and provide an updated cost for this extension. This extension, if completed, would relegate the injection wells to virtually back up use (on rainy days) instead of being relied upon every day to dispose of excess R-1 recycled water. What makes this potential project more appealing is that up to 1 million gallons of precious potable water would be saved. Note that this potable water originates from the Iao/Waihee aquifers. The Iao aquifer has been designated as "threatened" by the Commission on Water Resource Management.

Estimated Cost: \$75,000

Priority 4: A Feasibility Study to examine the concept of Decentralized Wastewater Management for the island of Maui. NOTE: The WWRD submitted a request for this study last year. (Should check the FY 2017 approved budget to see if it was approved).

Discussion: Decentralizing means constructing smaller wastewater reclamation facilities that treat wastewater closer to its source of origin. This allows for a higher percentage of the recycled water to be reused since long, costly water distribution systems do not need to be built. For example; instead of constructing an extension of the Kihei WWRF R-1 water distribution system to Wailea, it may be more cost effective to construct a "scalping" plant in the Wailea area. A "scalping" plant would intercept the wastewater that is flowing out of Wailea and process it to R-1 water quality. The R-1 water produced at the facility then can be used in the Wailea area for irrigation of hotel landscaping and golf courses.

Justification: Decentralization is recognized as a proven method by the Water Environment Federation (WEF) as a means to significantly increase water reuse. The island of Kauai has a number of small wastewater facilities around the island. Each treats less than 1 MGD (million gallons per day). Most of Kauai's wastewater facilities are located next to either golf courses or major agriculture where the recycled water is used for irrigation. As a result, Kauai is beneficially using up to 90% of the recycled water produced at its wastewater facilities for irrigation purposes.

This concept may be a good solution to the central Maui wastewater situation where the Kahului WWRF is located right on the coast making it vulnerable to tsunamis and rising sea level due to global warming. It would be prudent to closely evaluate the concept of decentralized wastewater management before we are in a crisis situation.

Estimated Cost: \$150,000 - \$200,000