



## Summary of Morro Bay WRF Master Plan (Draft November 2016)

### **Introduction**

The Morro Bay Water Reclamation Facility Master Plan (WRF FMP) is a major milestone in the planning process for the City's WRF Project. The FMP was developed from nine (9) Technical Memoranda (TMs) that address different technical aspects of the project; input from the Water Reclamation Facility Citizens Advisory Committee, staff, and City Council; and comments from citizens and stakeholders received through community workshops, meetings, and direct communication with staff.

The WRF provides the City the ability to meet goals developed by the community while producing water capable of meeting the "Highest and Best Uses" to facilitate a locally sustainable and affordable water supply. These reuse opportunities include, in descending order, groundwater injection to supplement the City water supply; agricultural irrigation; unrestricted irrigation; restricted irrigation; and should reclamation of 100% of the water prove to be infeasible then ocean discharge.

### **WRF Components**

Major components of the WRF explored in the Facility Master Plan include the influent pump station, raw wastewater force main, water reclamation facility (treatment plant), and brine/wet weather discharge pipeline. Advanced treatment, storage, and pumping required for recycled water were also addressed. Pipelines, injection wells, and other recycled water system components outside of the WRF itself were not included in this study.

Potential sites for a new influent pump station were studied and two were selected based comparative capital and operating cost. Both sites are in the vicinity of the existing wastewater treatment plant, on Atascadero Road, since the City wastewater collection system terminates at that location.

The FMP developed various liquid and solids treatment alternatives that aligned with community goals. The alternatives were evaluated using criteria such as comparative capital cost, comparative operating cost, odor mitigation, technical complexity, reliability, staff requirements, scalability, product water quality, flexibility for Title 22 (recycled water regulations) redundancy, and visual impact / footprint.

### **Recommendations and Conclusions**

The FMP has recommended a pump station in the location of the existing wastewater treatment plant, and a raw wastewater pipeline alignment that generally follows Quintana Road to the South Bay Blvd site. The pipeline alignment along Quintana Road is recommended because it is the most accessible for operations and maintenance, is less environmentally impactful, and provides lower pumping costs.

To achieve community goals for any of the highest and best uses of product water, reverse osmosis and advanced oxidation (UV light and hydrogen peroxide) will be required for either salt removal (sensitive crops) or for indirect potable reuse via groundwater injection.

The FMP recommends two treatment alternatives to meet City goals. Both alternatives include preliminary treatment, disinfection and solids handling, and differ by type of biological treatment and filtration. The treatment alternative will be determined during detailed design.

- **Sequencing Batch Reactor (SBR).** SBRs are compact and efficient, combining mixing, aeration, and clarification in a single tank utilizing fill, drain, and aeration controls. Tertiary treatment is accomplished with subsequent membrane filtration and UV disinfection.

- **Membrane Bioreactor (MBR).** Similar to SBR, the MBR would provide biological treatment steps. The MBR also integrates the filtration step needed for tertiary treatment. UV disinfection would also be provided.

The FMP investigated opportunities to reduce costs for the project through onsite composting or power generation from biosolids. Neither opportunity presented a cost advantage. Therefore, it is anticipated that the City will continue its current practice of engaging a contractor to retrieve biosolids for regional composting operations.

### Site Planning

The preliminary architectural concept is to construct farm or dairy style buildings for the WRF. The recommendation is for a color palette similar to buildings along Highway 1 between the California Men’s Colony and Morro Bay. A landscaped screening is also envisioned near the entrance to the WRF. The general recommendation is to provide a facility that visually blends well with the surrounding landscape.



### Construction Cost Opinions

The cost opinion is \$119M for design engineering and construction of the Sequencing Batch Reactor alternative, and \$120M if a Membrane Bioreactor system is pursued instead. For advanced treatment (which includes reverse osmosis, an additional UV system, and a hydrogen peroxide feed system, recycled water pumping, and recycled water storage to meet requirements for indirect potable reuse), the estimated cost is \$14.5M. These opinions include a contingency of 25% of construction cost. These costs do not include recycled water pipelines, injection wells, recycled water services, construction management, procurement, planning, permitting, or environmental mitigation. It is anticipated that these offsite recycled water project elements and support services will add approximately 13 to 28% (or \$15 to \$33M) to the baseline cost of the WRF. This would bring the total estimated project cost to \$150 - \$168M. This project will have an impact to sewer rates bringing the average combined sewer/water bill to approximately \$180 to \$230/month. At this time, the range of possible reuse alternatives is the major source of variation in the total cost opinion. Detailed recycled water costs will be developed through the ongoing Master Water Reclamation Plan, allowing the City to refine the program budget.