

# AWPCA 2006 WASTEWATER PROJECT OF THE YEAR

## Desert Dunes Water Reclamation Facility

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### PROJECT DESCRIPTION

The City of Yuma and Carollo Engineers (Carollo) formed and nurtured a strong, working partnership to deliver the City's vision of water reclamation facilities to service the rapid growth in the City's East Mesa area. Carollo provided technical leadership and engineering services throughout the master planning, design, construction management, and commissioning stages for Phase 1 of the 3-million gallon per day (mgd) City of Yuma Desert Dunes Water Reclamation Facility (WRF). The team developed a facility master plan for an ultimate capacity of 12 mgd to accommodate growth projections through Yuma's East Mesa area's build out.

A key to the strong partnership was Carollo's direction of the project from the early master planning stages through construction and commissioning services. Carollo's project manager, who served during the planning and design phase, also served as the manager during construction and commissioning. This "concept-to-commissioning" approach to client service preserved the in-depth project knowledge throughout the life of the project, which resulted in the new plant's Aquifer Protection Permit being procured a full year prior to commissioning. Other benefits of this approach were expedition of the project's design schedule, preservation of design intent during construction, and timely start-up of the plant.

The City of Yuma's vision directed the proposed facility to use advanced technology via remote operations to produce Class A+ reclaimed water, in accordance with the City's long range reclaimed water plan. The facility will be easily expandable while maintaining its reliability, effectiveness, and its "good neighbor" relationship with the rapidly developing East Mesa Area. The ideal site location and reasonable property costs directed the partnership to focus on acquisition of property from the Bureau of Land Management. However, since the proposed site was identified as potential habitat for the endangered flat-tailed horned lizard, the challenge of being a sensitive steward of the environment was immediately placed at the forefront of all project activities. A site conservation program was jointly developed with United States Fish and Wildlife Service. This program provided for the delivery of the new reclamation plant while assuring the protection and relocation of any lizards discovered at the site.

The challenge of being a "good neighbor" to the environment was put in the forefront of all project activities. This mission resulted in a "can't see, can't smell, can't hear" facility.

Significant attention was directed to the landscape and architectural design as well as a public participation forum to

promote the City's "good neighbor" policy. The plant's architectural placement of partially buried structures and selection of masonry materials in a color indigenous to the area reflect the plant's sensitivity to the desert environment. The site landscaping scheme included incorporating excavated material into the site's perimeter berms, creating the dunes alluded to in the plant's name. These dunes aid in shielding the facilities from neighbors and provide a landscaped backdrop for planned bike and jogging trails around the site. They serve a secondary purpose in reducing construction traffic and dirt moving costs during initial construction and future expansions. These dunes became the facility's signature feature and were highlighted by the community in the winning submission for a City sponsored naming contest: the Desert Dunes Water Reclamation Facility.

A unique role for the engineer on this project was to partner with the City to respond to the rapidly changing environment in the East Mesa. The East Mesa's current growth is best described as "explosive." The statement, "Build It and They Will Come," rather accurately illustrates the present population boom in the East Mesa service area especially the major developments that parallel the WRF's southern border. Throughout the design phase,

the partnership constantly reviewed the wastewater flow projections and the development applications.

With the start of construction, the City and Carollo expanded their partnership to include the contractor, PCL Constructors, Inc. and their team of sub-contractors. This construction partnership provided an atmosphere that allowed the project to effectively accept roadway alignment changes, expedite construction projects, and

adapt to the needs of continuing development. Prime examples are the project's response to the immediate needs of neighbors and taking advantage of the recent availability of a citywide fiber optic network. This example involved a neighboring development that requested the plant's startup be expedited a month. The partnership responded with a revised commissioning plan that accommodated the neighbor's request. Another example responded to the rapid residential development's pushing forward the availability of fiber optics in the area. The availability of advanced communications technology prompted the project to rework the plant's SCADA system from a radio-based network to fiber optics through the City's intranet system. The partnership coordinated all parties to allow this project to be responsive to both the changing needs of the community and the City's organization.



## **SOCIAL/ECONOMIC CONSIDERATIONS**

Liberal 350-foot setbacks from the site property lines were adopted for all treatment processes to meet regulatory requirements. The setbacks help make the plant more difficult to see from adjacent roadways and neighborhoods. A desert-colored color scheme was adopted for all structures to blend with the surrounding desert. The brown hues selected are similar to the colors found on the adjacent properties. Building height was restricted to minimize visibility. A layout of block walls and landscaped dunes with hidden fencing provides security and obstructs lines of sight into the plant. Plant treatment facilities were also carefully positioned behind the fencing and landscaped dunes help screen the plant from view.

Landscaping at the Desert Dunes WRF included planting trees of various species native to the surrounding desert and consistent with the neighboring developments. Strategic placement of entrances and minimal roadways eliminated the concept of an “asphalt jungle” or industrial site around the plant. The resulting landscape panorama permitted the facility to virtually blend in with the surroundings and “disappear” from view. Considerable care was taken to eliminate noise from the plant. On several occasions, passersby queried construction crews as to when the mall or golf resort would be complete.

The plant incorporates odor control for the influent through secondary treatment. All process basins and channels are covered. Foul air is withdrawn, and treated in wet scrubber units. Odors around the plant are non-existent—an example of the implementation of technology to comply with the community’s social requirements.

Although the Desert Dunes WRF incorporates many conventional treatment processes, an unconventional, innovative level of care went into designing the plant to be a “good neighbor.” Many design features were implemented to ensure that neighbors would not “see, hear or smell” the plant.

## **MEETING AND EXCEEDING OWNER’S NEEDS**

The City and Carollo approached the design of the facility in a partnered arrangement with other project stakeholders. This approach allowed for the continual exchange of information and ideas such that the owner’s needs were addressed and incorporated in the project. Because communication between the owner, the engineer, and the construction team was candid and directed to the goal of consensus decision, the project progressed on schedule and on budget.

The Desert Dunes WRF is now a showpiece public facility for the City of Yuma and provides a cornerstone for the future of the East Mesa community. This reclamation plant provides an example of how a key facility can exist in harmony with proximate neighborhoods. The facility is well hidden from view and blends in with the surrounding terrain. A stroll through the plant confirms that we met the goals of no noise and no odors. The Desert Dunes WRF will continue to provide this much-valued resource to residents in this area of Yuma for many years to come.

