

Aerisa Helps Liberty Water Restore Clean Air to Local Community

The Facility

Built in 2002, the Palm Valley Water Reclamation Facility (PVWRF), a Liberty Water utility, served 20,000 customers in Goodyear, Avondale, and Litchfield Park, Arizona with wastewater services in 2007. Since the plant opened, the area experienced rapid growth, and today, several residential developments are as close as 150 feet from the site. Some businesses are as close as 1,000 feet away.

The Community and Regulatory Challenge

Any odors the plant may have produced when the area was sparsely populated were easily diluted in the atmosphere, causing no nuisance to local businesses or residents. But as residential and commercial neighbors encroached and waste flow into the site grew, complaints increased as well. Both the Headworks and Solids buildings of the plant were producing high levels of hydrogen sulfide (H₂S). Due to complaints from the City of Litchfield Park, the Arizona Corporation Commission confronted Liberty Water, then Litchfield Park Services Company (LPSCo), and demanded the odor issue be resolved as soon as possible.

McBride Engineering Solutions (MES) worked with Liberty Water to find a solution that would create efficiencies in the plant's waste processes to help maximize odor abatement while reducing costs – with objective number one to reduce community complaints to zero. Any solution would be tested by a highly subjective “smell test,” which proved to be one of the most difficult challenges of all. Alternative air purification solutions were assessed, along with a custom engineering solution to expand the current chemical/carbon scrubber technology. However, each proposed solution proved too expensive and time consuming to meet the

ACC deadlines, or did not rectify the odor problems well enough to ensure the elimination of local complaints.

The Solution and Results

Prior to the Aerisa WaveFour™ implementation, the Headworks H₂S levels had averaged nearly 30 ppm. Replacement of media in the influent process, the acquisition of new test instruments and improving plant procedures helped reduce the readings to less than 11 ppm. Following the initial installation of Aerisa's cold plasma equipment, data recorded from inside the plant indicated drastically better results – providing the lowest H₂S readings on record at 0.1 ppm.

Subsequent tuning of the Aerisa technology resulted in H₂S levels that were too low to be measured by testing equipment. And importantly, results of the subjective “smell tests” from nearby community residents demonstrated that the air outside the plant was as fresh as that inside the plant. Since then, no new nuisance odors have been reported, and community complaints have all but stopped.

Financial Success and the Future

The project was also highly successful from a financial perspective, with capital costs less than half of the alternative scrubber solutions initially considered. In addition, the maintenance costs are projected to be one-third of the traditional scrubber systems, resulting in a very attractive overall total cost of ownership. Further analysis of the business case for the cold plasma equipment in comparison to the existing wet scrubber system will be conducted to provide more detailed financial benefits of the technology.

Palm Valley Highlights

- Ongoing community complaints and regulatory requirement drove the need to resolve odor issues
- Difficult to identify the root cause of odor sources; solutions subjected to a community “smell test”
- Alternative air purification or custom engineering solutions proved too expensive and time consuming
- Aerisa™ Benefits:
 - ~ reduced odors
 - ~ eliminated community complaints
 - ~ saved hundreds of thousands of dollars
 - ~ reduced H₂S below detection levels
 - ~ beat regulatory deadline without using chemical or bio agents



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