

PALM VALLEY WATER RECLAMATION FACILITY (WRF)

Aquifer Protection Permit No. P-100310

Place ID 815, LTF No. 93045

Significant Amendment

I. Introduction:

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an Aquifer Protection Permit (APP) for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards (AWQS) at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

II. Permittee & Facility Location:

The Liberty Utilities (Litchfield Park Water & Sewer) Corporation owns and operates the Palm Valley Water Reclamation Facility (WRF) located at 14222 West McDowell Road, Goodyear, Maricopa County, Arizona, 85395, over the groundwater of the Phoenix Active Management Area. The Palm Valley WRF is located on County Parcel 501-76-946. The Litchfield Park Water & Sewer offices are located at 14920 W. Camelback Rd., Litchfield Park, Goodyear, Maricopa County, Arizona 85340.

III. Facility Description:

The permittee is authorized to operate the Palm Valley WRF, with a maximum average monthly flow of 6.9 mgd for Stage 1 Modifications and 7.17 and 7.47 mgd for Stage 2 Temporary Modifications. The Department has graded this facility as a Grade 4 wastewater treatment plant. The facility shall have an operator in direct responsible charge who is certified for the grade of the facility and inspects it daily.

Palm Valley WRF Stage 1 WRF (6.9 MGD)

The treatment process consists of a headworks that includes an influent pump station (IPS) with four 4,150-gpm pumps (3 duty; 1 standby) that pump into a common header that feeds three 7.9 mgd ¼-inch reciprocating influent screens (2 duty; 1 standby) with a washer compactor, then two vortex grit chambers (11.0 mgd and 7.0 mgd) with a grit classifier and washer. The screens and grit process can be bypassed directly into the Sequencing Batch Reactor (SBR) basins. Preliminary treated effluent flows to a 760,000 gallon influent equalization (EQ) basin, equipped with three (2 duty; 1 standby) VFD operated 5,500-gpm SBR feed pumps.

From the EQ basin, flow is pumped to an influent manifold that distributes the influent to the bottom of four Sequencing Batch Reactors (SBR 1, SBR 2, SBR 3, and SBR 4) basins with jet aeration, motive pumps, and decanters. SBR Basins 1 and 2 has five 1,600-cfm blowers, two dedicated to each SBR and one common redundant blower, and four 5,900-gpm motive pumps in each basin. SBR basins 3

and 4 has five 1,800-cfm blowers, two dedicated to each SBR and one common redundant blower, and two 7,300-gpm motive pumps in each basin. SBR 1 and 2 has one 1,000-gpm WAS pumps, and SBR 3 and 4 has two 1,300-gpm WAS pumps in each basin. WAS is pumped to one of four sludge holding tanks. Sludge Holding Tanks 1-3 have perforated membrane tube diffusers, while Sludge Holding Tank 4 has jet aeration, because it was converted from an SBR.

Secondary effluent is decanted from the SBRs into a header that sends it to two surge tanks equipped with three pumps (5,700-gpm, 5,700-gpm, and 1,400-gpm) to attenuate the flow before it is pumped into five 2.0-mgd disk filters (4 duty; 1 standby), each equipped with 8 disks. A clearwell with four 2,000-gpm turbine pumps receives effluent from the disk filters and pumps it through the UV disinfection system with three 5-mgd UV trains (2 duty; 1 standby) with 2 UV reactors (eight lamps each) per train. The WRF is designed to produce Reclaimed Water Reuse Class A+ effluent. Prior to entering the reclaimed water distribution system, the permittee may inject sodium hypochlorite to help prevent microbial growth in the surge tanks, clearwell, disk filters, and reclaimed water distribution system.

The effluent from the WRF may be discharged to recharge at the Sustainable Effluent Aquifer Project (SEAP: APP No. 514107) located three miles north of the WRF, the Roosevelt Irrigation District (RID) canal under a valid AZPDES permit (AZ0025712), and/or reused for any allowable use under a valid reclaimed water permit. An interconnection between the Palm Valley (Which includes the Sarival WRF APP No. 513981) reclaimed water distribution system and the City of Goodyear 157th Avenue WRF reclaimed water distribution system allows reclaimed water to flow either way between the systems. Discharges to the RID canal are exempt from APP requirements pursuant to A.R.S. § 49-250(B)(6) and (16).

The Stage 1 Modifications included SCADA modifications to revise the program command for the fill setpoint and increase the total depth by 1 foot. This decreased the freeboard from 3-feet to 2-feet, increased the decant flow by 12,000 gallons, and increased the combined treatment capacity of the SBRs by 0.35 mgd.

Palm Valley WRF Stage 2A Temporary Modifications (7.17 MGD)

The Stage 2A Temporary Modifications include conversion of SBR Basin 1 to a Flow Through Reactor (FTR) basin that will remove the decant, settle, and idle phases and add clarifiers to perform these processes. This includes, adding a duplex skid-mounted pump system with two 3,000 gpm mixed liquor pumps, and six 10-ft x 47-ft x 10-ft temporary frac tanks (5 duty; 1 standby) with clarifier inserts that are 'dropped in' for a clarification capacity of 0.432 mgd for each frac tank. RAS will be sent from the six clarifiers to the beginning of FTR 1, or wasted to the sludge holding tanks. Effluent will be sent to the clear well. A spare clearwell pump will be purchased and remain near the clearwell, to meet redundancy requirements for the temporary modifications. RAS will be sent from the six clarifiers to the beginning of FTR 1 basin, so that it does not enter SBR 2, 3, or 4, and the WAS will be sent to the sludge holding tanks for further processing. The temporary clarifiers do not provide scum removal, therefore daily maintenance will include scum removal from a combination vacuum truck, or other method to get scum back to the sludge holding tanks or disposed of at a landfill. SBR 2, 3, and 4 will continue to operate with the Stage 1 Modifications.

Palm Valley WRF Stage 2B Temporary Modifications (7.47 MGD)

The Stage 2B Temporary Modifications include the modifications made in the Stage 2A Temporary Modifications, and conversion of SBR Basin 2 to an FTR basin, so that both SBR 1 and SBR 2 have been converted to FTR basins (FTR 1 and FTR 2). Five more temporary frac tanks (for a total of 10 duty; 1 standby) with clarifier modifications will be added to the facility. RAS will be sent from the 11 clarifiers to the beginning of the FTBs so that it does not enter SBR 3 or 4, and the WAS will be sent to the sludge holding tanks for further processing. SBR 3, and SBR 4 will continue to operate with the Stage 1 Modifications.

When the Sarival WRF (permitted for 4.4 MGD) comes online and starts treating wastewater, currently treated by the Palm Valley WRF, the Stage 2 Temporary Modifications will be discontinued, and the Stage 1 improvements will remain in operation. The permitted capacity will revert back to 6.9 MGD.

All the sludge, including screenings, grit, and scum, shall be hauled to landfill for disposal in accordance with State and Federal regulations.

IV. Amendment Description:

The purpose of this amendment is to increase the permitted capacity of the Palm Valley WRF from 6.55 mgd to 6.90 mgd by performing SCADA modifications to allow for an overall increase of 1.0 ft of decant volume in the four SBRs. This amendment also incorporates a temporary permit with two stages of permitted capacity of 7.17 (Stage 2A) and 7.47 mgd (Stage 2B). Liberty Utilities is building a new WRF at the location of the Sarival lift station (at the intersection of N. Sarival Ave and W. McDowell Rd). This lift station currently delivers flows to the Palm Valley WRF, and once the Sarival WRF (APP No. 513981; Capacity 4.4 mgd) has commenced operation, it will alleviate predictive capacity issues at the Palm Valley WRF. When constructed, the Sarival WRF will take 1.8 mgd of flow, currently being sent to Palm Valley WRF, including industrial flows from Fairlife Dairy and the Microsoft Data Center. After the Sarival WRF is constructed, the Palm Valley Temporary Stage 2A/2B modifications, if constructed, will need to be removed and the Palm Valley WRF will continue to operate with the Stage 1 modifications. The APP will need to be amended to remove the incorporated temporary permit from the Palm Valley WRF's life of the facility permit.

This amendment also removes the Sustainable Effluent Aquifer Project (SEAP: APP No. 514107) from the Palm Valley WRF. The SEAP is located three miles north of the WRF and receives effluent from a shared reclaimed water distribution system. An interconnection between the Palm Valley (Which includes the Sarival WRF APP No. 513981) reclaimed water distribution system and the City of Goodyear 157th Avenue WRF reclaimed water distribution system allows reclaimed water to flow either way between the systems.

V. Regulatory Status:

No current open enforcement actions.

VI. Financial Capability

The permittee has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The estimated dollar amount for facility closure is \$1,236,163.25. The financial capability was demonstrated through a Letter of Credit A.A.C. R18-9-A203(C)(5).

VII. Best Available Demonstrated Control Technology (BADCT):

The treatment facility shall be designed, constructed, operated, and maintained to continuously meet the treatment performance criteria for new facilities as specified in A.A.C. R18-9-B204. The facility shall meet the performance requirement for industrial pre-treatment as per A.A.C. R18-9-B204(B)(6)(b).

The treatment facility shall not exceed a maximum seepage rate of 550 gallons per day per acre for all containment structures within the treatment works.

The Stage 1 and Stage 2 Temporary improvements were designed as per the design report signed, dated, and sealed by Steven John Wedwick, P.E (Civil #35182) with NCS Engineers on March 3, 2023, and any subsequent submittals. As part of these improvements, the SEAP was moved to its own APP No. 514107, since the SEAP is three miles from the treatment works.

The expansion of the WRF was designed and constructed per the design report and plans signed, dated, and sealed on November 2014, by Tim Leclair, P.E. (Civil #43824), with Amec Environmental & Infrastructure, Inc., and subsequent sealed submittals that served as additions to the design report.

VIII. Compliance with Aquifer Water Quality Standards (AWQS):

Groundwater monitoring is not required at the conceptual points of compliance, except as a contingency action at the WRF. Monitoring wells MW-1 and MW-2 were switched to conceptual point of compliance (POC) wells in 2020 during an APP amendment (LTF No.73291). The Director may amend this permit to require the installation of a well and the initiation of groundwater monitoring at the POC, or to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need

The depth to groundwater beneath the WRF is approximately 120 feet below land surface and the principal direction of groundwater flow is towards the northwest.