JOMAX WATER RECLAMATION FACILITY
Aquifer Protection Permit No. P-105021
Place ID 16639, LTF No. 76868
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 City of Peoria owns the Jomax WRF, which is located in the City of Peoria at 12483 West Jomax Road in Maricopa County, over the groundwater of the Phoenix Active Management Area. The Jomax WRF serves the Vistancia North and South residential and commercial development areas, as well as additional areas of the City's Northwest planning service area.

III. Facility Description:

The permittee is authorized to operate the Jomax Water Reclamation Facility, with a maximum average monthly flow of 2.25 million gallons per day (mgd) for the existing Phase 2A; 3.0 mgd for Phase 2B and Phase 2 Interim Improvement; and 4.5 mgd for Phase 3. ADEQ has graded this facility as a Grade 4 wastewater treatment plant for all phases covered by this permit. The facility shall have an operator in direct responsible charge who is certified for the grade of the facility and inspects the facility daily.

Existing Facility Phase 2A: The existing Phase 2 WRF has a treatment capacity of 2.25 mgd. The Phase 2 treatment plants do not contain influent equalization. An influent pump station (IPS) is equipped with two 2,800 gpm pumps, one 1,000 gpm pump, and a mixer in the Pump #1 slot and lifts influent to a headworks with a 6mm mechanical bar screen, and vortex grit removal system. The screening area has three channels, of which the main channel has a 6mm fine screen, second a manual bar screen and third is an empty overflow channel. Grit removal consists of a Vortex grit removal system with a classifier and grit pump (no redundancy). From the headworks, influent flows through a flow control structure, where it is joined with return activated sludge (RAS) and then to three bioreactors (1A, 1B, and 2A) that each contain an anoxic zone (with two mixers) where mixed liquors mix with the influent for denitrification. From the anoxic zone, the mixed liquors travel through three aeration zones (Zone 2, 3, and 4). One turbo blower provides air to the three aeration zones in all three bioreactors, and an IMLR pump in each reactor returns flow back to the anoxic zone. From the aeration basins, mixed liquors flow to a splitter box that split the flow to two clarifiers. The two clarifiers share three separate pump stations for RAS/WAS (4 RAS and 2 WAS pumps), scum removal (2 pumps), and tank drain (wet well with no pumps). If necessary, covers and odor control can be removed from the clarifiers. Only periodic spraying of service water is allowed outside of the scum ring. From the clarifiers, effluent flows to two rapid mix basins (RMBs) and two flocculation basins (FBs) equipped with a chemical feed system for polymer or sodium hypochlorite. The RMBs, FBs, and polymer feed system are only utilized during high turbidity events as required by A.A.C. R18-11-303. Sodium hypochlorite is periodically added to prevent growth in the three traveling bridge filters. From the traveling

bridge filters effluent is disinfected by a Trojan 3000+ system with three banks, and eight modules with 8 lamps each for a total of 192 lamps. After disinfection, the effluent pump station (with four vertical turbine pumps 2 - 2,675 gpm and 2 - 500 gpm) delivers Class A+ water to a non-potable water reservoir (tank) which delivers Class A+ reuse water or discharged to McMicken Wash.

Waste activated sludge and scum are pumped to Sludge Holding Tank (SHT) #1. Two 745 SCFM blowers (one duty and one standby) supply air to the coarse air system in SHT #1. From SHT #1, two 250 gpm sludge feed pumps (primary and standby) and a polymer feed system mix sludge before being dried by a 175 gpm Centrifuge. A conveyor delivers dried sludge to a roll-off.

Three chemical odor control units (No. 1 = 14,712 CFM; No. 3 = 13,600CFM, and No. 5 = 7,600 CFM) treat odors from the different wastewater treatment odor producing areas. OCU #5 has a carbon absorption polishing vessel attached to it.

Manual de-chlorination is performed after the NPW reservoir prior to discharge to McMicken Wash. A 1.75-megawatt diesel generator provides back-up power to the site should there be a power failure.

Phase 2B: The existing Phase 2B WRF has a treatment capacity of 3.00 mgd. The IPS mixer in Pump #1 slot will be relocated and a 3rd large pump will be installed (three 2,800 gpm pumps, one 1,000 gpm pump, and a mixer). The current 6mm fine screen will be replaced with a rake type fine screen, and a new additional rake fine screen in the empty channel. The manual bar rack will remain in the 3rd overflow channel. Two new washer compactors will accompany the new rake screens. A redundant grit pump and grit classifier will be added to serve the vortex grit removal system. The flow control structure will be extended to send flow to a new Bioreactor 2B, which will be identical to the other three basins, with the exception for better aeration control, Zone 2 will be further divided into Zone 2A and 2B, with an electrically actuated valve on the drop-leg for Zone 2A for operational flexibility. Three existing centrifugal blowers (two 5,400 cfm and one 2,700 cfm) will be recommissioned and added to the turbo blower manifold to provide enough air for all four bioreactors. For the clarifiers, there will be an addition of sludge blanket level meters, and installation of one submersible pump in the clarifier tank drain pump station. A Trojan Signa system with six banks, each with 10 lamps for a total of 60 lamps will be installed parallel to the current Trojan 3000+ system. The 3000+ system will remain in place for redundancy. The effluent pump station will replace one of the small 500 gpm pumps with another 2,675 gpm pump (for 3 - 2,675 gpm and 1 - 500 gpm) and a control valve will be added. A new Sludge Holding Tank #2 will be added, but will be connected to SHT #1 to form one large tank. A new 745 SCFM capacity positive displacement blower will be added to the two existing blowers. Coarse air from the blowers, service water for foam control, and odor control will be connected to SHT #2. Decanting valves no. 2 to no. 5 will be actuated. A new polymer feed system will be added to the existing system. A new 350 gpm Feed Pump #3 will supply a new larger 350 gpm Centrifuge #2 and Feed Pump #2 will be replaced with a larger 350 gpm feed pump while acting as a backup to Feed Pump #1 and #3. Feed Pump #1 will continue to deliver sludge to the smaller 175 gpm centrifuge. The dried sludge conveyance system will also be upgraded.

Phase 2 Interim improvements: These interim improvements will not affect the capacity, but will instead help improve processes around the facility. Bioreactors 1A, 1B, and 2A will be equipped with better aeration control to match the Phase 2B bioreactor. Actuated slide gates in the clarifier splitter-box, and sludge flowmeters between clarifiers and RAS/WAS pump station will be installed to help operators better control flow. A VFD will be added to the secondary WAS pump. Influent slide gates will be installed between traveling bridge filter #2 and #3, and the weir will be raised by three inches, add three scum slide gates near the filter effluent channels and add drain piping to the RMBs and FBs. The ladder will be replaced by stairs to SHT #1, a manhole pump station at the sludge feed pump station, and gas (CH4 and H2S) meters in the solids handling building will complete these improvements. A new dechlorination sump,

dechlorination chemical feed system, and flow meter will be installed after the effluent pump station for AZPDES discharges to McMicken Wash.

Phase 3: The existing Phase 3 WRF has a treatment capacity of 4.50 mgd. A new 540,000-gallon influent EQ Basin and pump station, with three submersible pumps (400 gpm each), two submersible mixers, and overflow to the headworks IPS will be constructed. The IPS will have the final small pump in the Pump #3 slot replaced with a new large pump (4-2,800 gpm pumps). The IPS will be modified to have baffle walls, isolation gates and recirculation lines with actuated valves. The flow control structure will be modified to send flow to new Bioreactor 3A and Bioreactor 3B, for a total of six bioreactors. These bioreactors will be identical to the existing basins, however will be separated by a road. An additional existing small centrifugal blower will be recommissioned so that four centrifugal blowers supply air to the bioreactors. A second clarifier splitter box that will receive flows from Bioreactors 3A and 3B, and send flow to two new secondary clarifiers, with three new pump stations for RAS/WAS (3 RAS and 2 WAS pumps, with space for a future 4th RAS pump), scum removal (2 pumps), and tank drain (wet well with one pump). Clarifiers will be constructed identical to the other clarifier improvements performed prior to this phase. If necessary, covers and odor control can be removed from the clarifiers. A disk filter and a new 36-inch gate valve will be installed. A second Trojan Signa UV system with five banks (4 new banks, and a bank removed from the first system and reinstalled in the new system) will be installed in a second channel. The two UV systems, operating in parallel, will both have a total of 5 banks/50 lamps in each system, with a weir to split flows evenly into the two systems. The Trojan 3000+ system will no longer be utilized and can be decommissioned, but may remain in place and periodically tested for added redundancy. For the effluent Pump station, the last 500 gpm pump will be replaced by a 2,675 gpm pump. (4-2,675 gpm pumps). For sludge storage and processing, a new SHT #3 will be installed and centrifuge #1 will be replaced by a new 350 gpm centrifuge. Sludge feed Pump #1 will be replaced by a new 350 gpm feed pump, so that all three feed pumps are the same size. The dried sludge conveyance system will be modified for the new centrifuge. A new 745 SCFM positive displacement Blower #4 will be installed to supply air to SHT #3 coarse air system. Three biofilters will be added to the odor control units (No. 2 = 23,000 CFM, No. 4 = 12,500 CFM, and No. 6 = 19,000 CFM). Each biofilter will have two blowers (one duty and one standby with upstream grease-traps) to extract foul air. As necessary, existing chemical odor control scrubbers could be decommissioned. An additional 1.75-megawatt diesel generator will be installed for back-up power to operate in parallel with the existing generator. Effluent will be disposed of in the same manner as Phase 2 Interim Improvements.

Effluent Disposal: The WRF is rated as producing Class A+ reclaimed water according to A.A.C. R18-11, Article 3 in all phases. The effluent is continuously reused within the Vistancia, LLC development for golf course and park irrigation under a valid Reuse permit. In the event that irrigation demand is less than the effluent produced by the WRF, effluent is discharged to McMicken Wash under ADEQ's AZPDES regulations (a modification to the AZPDES permit has been submitted to ADEQ as well). During summer months reclaimed water is blended with screened Maricopa Water District canal water and chlorinated prior to entering the reclaimed distribution system.

All industrial hookups and other non-residential hookups to the treatment system shall be authorized according to the applicable federal, state or local regulations. hookups and other non-residential hookups to the treatment system shall be authorized according to the applicable federal, state or local regulations.

IV. Amendment Description:

There is an increase in permitted capacity that is greater than 10% of the existing permitted capacity, which makes this a significant amendment as per A.A.C. R18-9-A211(B)(1)&(2).

The purpose of this amendment is to perform a phased expansion project that will increase the current Phase 2A capacity from 2.25 MGD treatment capacity to 4.5 MGD (maximum month) in two phases. This phased expansion will include an interim phase to perform improvements that contribute to, but does not increase the capacity of the WRF. The first Phase, Phase 2B, will increase the capacity to 3.0 MGD, and the Phase 3 improvements will increase the capacity to 4.4 MGD.

The Jomax WRF is located in the City of Peoria and is operated by the City of Peoria. The WRF currently has the ability to treat 2.25 MGD (maximum month) of municipal wastewater from the Vistancia, LLC (also known as Vistancia South and Vistancia North) residential and commercial developments, as well as, additional areas of the City's Northwest Planning and Service Area. The facility will not receive any industrial wastewater during this phase or during future phases. The WRF expansion project will be designed to continue to meet Class A+ reclaimed water standards, per the Arizona Administrative Code (AAC) Section R18-11-303. The effluent is continuously reused within the Vistancia, LLC development for golf course and park irrigation. In the event that irrigation demand is less than the effluent produced by the WRF, effluent is discharged to McMicken Wash under ADEQ's AZPDES regulations (a modification to the AZPDES permit has been submitted to ADEQ as well). Dewatered sludge will be disposed of at a landfill.

V. Best Available Demonstrated Control Technology (BADCT):

- The facility will continue to denitrify the effluent to below 10.0 mg/l for total nitrogen. This treatment Plant technology is considered to meet BADCT requirements.
- Odor producing units are fully enclosed and ventilated to an odor control system to help meet odor control setback requirements. These odor control units are being upgraded to help further treat nuisance odors from the facility. As part of the permit amendment, the City of Peoria has been given permission to remove covers and ventilation from their clarifiers, which are considered to be non-odor producing treatment components, and covering of these units can be operator prohibitive in monitoring treatment performance.
- In Phase 3, facilities are being added, which will mirror the Phase 2 facilities and put a larger energy demand onto the system. To help with emergency contingencies, the City of Peoria is installing an additional 1.75-megawatt diesel generator for back-up power to operate in parallel with the existing generator.
- The outfall to McMicken Wash will be modified during the Phase 2 Interim Improvements in order to add a separate flowmeter, to add an engineering control to replace the current administrative controls for monitoring the non-routine discharges covered by the AZPDES permit. This new outfall will also provide a dechlorination location to meet surface water discharge requirements.

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

To ensure that site operations do not result in violation of Aquifer Water Quality Standards at the conceptual POC, representative samples of the effluent will be collected at the effluent pump station. The permittee will monitor the effluent daily for flow rate and fecal coliform, monthly for total nitrogen, quarterly for metals, and semi-annually for volatile and semi-volatile organic compounds (VOCs and SVOCs) and indicator parameters.

To ensure that site operations do not violate the Reclaimed Water Quality Standards for the beneficial use of Class A+ reclaimed water, the permittee will monitor the fecal coliform for the blended reclaimed water at the effluent pump station. The permittee will monitor the reclaimed water daily for turbidity, monthly for total nitrogen, and on a monthly/suspended basis for enteric virus at the discharge of the UV channel.