



# Fact Sheet

Aquifer Protection Permit #P-100642  
 Place ID 1010, LTF 45664  
 Avra Valley Water Reclamation Facility  
 SIGNIFICANT AMENDMENT

The Arizona Department of Environmental Quality (ADEQ) proposes to issue **an amendment** to the Aquifer Protection Permit for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to A.A.C. R18-9-A213. This document gives pertinent information concerning the issuance of the permit. 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 at the Point of Compliance; and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). The purpose of BADCT is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., local subsurface geology) to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer, or to keep pollutants from reaching the aquifer.

## I. FACILITY INFORMATION

### Name and Location

Name of Permittee:	Pima County Regional Wastewater Reclamation Department
Mailing Address:	Pima County Regional Wastewater Reclamation Department 7101 N. Casa Grande Hwy. Tucson, AZ. 85743
Facility Name and Location:	Pima County Avra Valley Wastewater Reclamation Facility 10,000 W. Snyder Hill Road Pima County, AZ

### Regulatory Status

The Pima County Wastewater Management Department submitted a Notice of Disposal (NOD) on January 21, 1985 under the Groundwater Quality Protection Permit Program, the predecessor to the Aquifer Protection Permit Program. A Reuse Permit was issued on December 15, 1997. An individual Aquifer Protection Permit (APP) was issued by ADEQ on March 31, 2001 for 2.2 MGD.

The following table includes APP amendments issued to Pima County Regional Wastewater Reclamation Department by the Arizona Department of Environmental Quality (ADEQ), for the Avra Valley WRF.

Amendment Type	Effective Date	Amendment Item
<b>Other Amendment</b>	08/28/2003	<ul style="list-style-type: none"> <li>• Classified the WRF for Class B+ reclaimed water.</li> <li>• Added fecal coliform monitoring for Class B+ reclaimed water.</li> <li>• Added additional treatment to improve the existing treatment train.</li> <li>• Added POC for contingency issues.</li> <li>• Stipulated management conditions for the use of the Emergency Overflow Pond.</li> </ul>
<b>Significant</b>	1/25/2007	<ul style="list-style-type: none"> <li>• Added improved treatment to the single oxidation ditch</li> </ul>

<b>Amendment</b>		<ul style="list-style-type: none"> <li>• Limited the number of days per year the unlined Emergency Overflow Pond could receive influent or untreated sewage</li> <li>• Added a requirement for the installation of a well at POC # 3.</li> <li>• Added additional discharge monitoring and groundwater monitoring at POC # 3.</li> <li>• Added compliance schedule items to address the construction of Phase II and the annual parcel and well construction reviews.</li> <li>• Changed Table IA to include Phase I flow monitoring for reuse, percolation ponds and AZPDES discharge.</li> <li>• Added Table IB to provide discharge monitoring for Phase II.</li> <li>• Added Table IC for monitoring discharges to the Blackwash Spray Fields.</li> <li>• Added Table ID for contingency monitoring when the annual flow exceeds 198 million gallons per year to the Blackwash AZPDES discharge area.</li> <li>• Added Table IE to monitor for the Class B+ Reclaimed Water Standards.</li> </ul>
<b>Significant Amendment</b>	12/18/2007	<ul style="list-style-type: none"> <li>• Installation of intermediate berms in the existing percolation basins to benefit operations.</li> <li>• Construct percolation Basin # 5 in the area where a portion of the existing spray field is located.</li> <li>• Removed the requirement for POC # 3.</li> </ul>
<b>Current Significant Amendment</b>		<ul style="list-style-type: none"> <li>• Added two new 2.0 MGD BNROD treatment trains. Existing 2.2 MGD treatment train will be idled for structural evaluation.</li> <li>• Added new filtration and ultraviolet (UV) disinfection equipment. Existing chlorine disinfection equipment will be used if UV system fails.</li> <li>• Remove “Theoretical” Hazardous Point of Compliance # 3.</li> <li>• Added a requirement to install a new well at Hazardous POC # 3 (Lat 32° 10’ 05” N, Long 111° 11’ 01” W).</li> <li>• Add new AZPDES Outfall # 6 and Outfall # 7.</li> <li>• Changed Table IIA POC #1.</li> <li>• Deleted Table IE for the Class B+ Reclaimed Water Standards.</li> <li>• Added Table IB monitoring for Class B+ Reclaimed Water</li> </ul>

**Facility Description**

The Pima County Regional Wastewater Reclamation Department is authorized to operate the Pima County Avra Valley WRF, a 4.0 million gallons per day (mgd) facility. The facility shall produce Class B+ reclaimed water. The treatment process consists of a lift station with submersible pumps with metering, headworks, fine screening and grit removal, two 2.0 mgd oxidation ditches with six surface aerators and four submerged aeration basin mixers in each basin, four secondary clarifiers, sand filtration, chemical feed, and UV disinfection. Chlorination/dechlorination may be used as backup disinfection.

The 4.0 million gallons per day (mgd) facility replaces the current 2.2 mgd facility. Until the new 4.0 mgd plant is built and operational, the facility shall monitor the effluent from the

existing plant in accordance with Section 4.2, Table IA and IB. Upon commencement of the operations from the new WWTP, the existing 2.2 mgd plant will be put in temporary cessation.

The effluent is disposed to six percolation ponds or discharged under AZPDES permit # AZ0024121, to the Blackwash spray field, Blackwash or through outfalls # 6 and 7. The effluent may also be stored in an emergency storage basin after the lining of this pond has been certified as per compliance schedule 3.7 or reused under a valid reclaimed water permit. Percolation basins 1 through 5 have been constructed. Percolation basins 6A-6D shall be constructed when effluent flow reaches 2.9 mgd as described in Section 3.7. Percolation basins 6E-6G are not included in this permit and therefore no disposal is authorized to them. The flow to the Blackwash spray field comes from the effluent line that also feeds outfalls # 6 and # 7, and the percolation basins.

The lined emergency influent storage basin and the unlined backup emergency overflow basin have been combined to produce a single lined emergency overflow basin. The lined emergency overflow basin may be used to store either influent or effluent. All liquid placed in this basin, whether influent or effluent shall go through the plant for treatment before disposal.

Waste activated sludge (WAS) is thickened and placed into a sludge holding tank and then hauled off-site to the Ina Road WRF or Roger Road WWTF for inclusion in their wastewater streams. One (1) lined sludge drying bed is included in the permit and is also available for emergency use. The existing 2.2 mgd plant shall remain non-operational. The facility may close the plant at a future date or leave it for future use. In case the permittee plans to re-start the existing plant, an amendment will be required to operate the facility according to new facility BADCT (A.A.C.R18-9-B204).

Depth to groundwater at the site is 415 feet below ground surface (bgs) and the direction of groundwater flow is to the north-northwest. All industrial hookups and other non-residential hookups to the treatment system shall be authorized according to the applicable federal, state or local regulations.

The site includes the following permitted discharging facilities:

<b>Facility</b>	<b>Latitude</b>	<b>Longitude</b>
WRF	32° 09' 53" N	111° 10' 31"W
Lined Emergency Influent Basin	32° 09' 51" N	111° 10' 34"W
Lined Reclaimed Water Reservoir	32° 09' 57" N	111° 10' 36"W
Discharge to Blackwash AZPDES Outfall # 6	32° 09' 54"N	111° 10' 56"W
Discharge to Blackwash AZPDES Outfall # 7	32° 10' 06"N	111° 11' 11"W
Discharge to Blackwash Spray Field	32° 09' 50.45N	111° 10' 49.85"W
Percolation Basin #1	32° 09' 53"N	111° 10' 31"W
Percolation Basin #2	32° 09' 53"N	111° 10' 31"W

Percolation Basin #3	32° 09' 53"N	111° 10' 31"W
Percolation Basin #4	32° 09' 53"N	111° 10' 31"W
Percolation Basin #5	32° 09' 51"N	111° 49' 08"W
Percolation Basin #6	32° 09' 53"N	111° 11' 02"W
Sludge Drying Bed	32° 09' 53"N	111° 10' 30"W

**Amendment Description**

This Significant Permit Amendment was initiated by the permittee, Pima County Regional Wastewater Reclamation Department (PCRWRD), to construct two new 2.0 MGD biological nutrient removal oxidation ditch treatment trains. The permit amendment also adds new filtration and ultra violet disinfection equipment.

1. Section 2.1 - Facility/Site Description: Added the new treatment trains, disinfection equipment, and future percolation basins #6A – 6D.
2. Section 2.2 - Best Available Demonstrated Control Technology: Changed this section to reflect the requirement for this facility to meet new facility BADCT standards after initial plant start-up is achieved.
3. Section 2.2.1 - Engineering Design: Changed this section to reflect the following: The design report in support of the Significant Permit Amendment construction was prepared, stamped, and signed July 24, 2007 by James W. Dettmer, AZ Registered Professional Engineer No. 27864.
4. Section 2.2.3 - Pre-Operational Requirements: Changed to reflect the requirement that an Engineer’s Certificate of Completion (ECOC) and start-up notification letter be submitted to ADEQ prior to new facility start-up.
5. Section 2.2.4.4 and 2.6.2.2.2 – Removed the unlined emergency overflow pond. This pond has been replaced by a new lined pond.
6. Section 2.5.2 – Added Table I.
7. 2.6.1.1 – Removed the requirement for private domestic well survey. The new POC # 3 well will make this survey no longer necessary.
8. Section 3.0 - Compliance Schedule: Added schedule items to include submittal of engineer’s statement of completion for the installation of new treatment facilities. Added new facility start-up requirements and added new POC # 3 well installation requirements.
9. Section 4.0 – Added Table I – Initial start-up monitoring. Added Table IIA, IIB and IIC.
10. Section 5 - References and Pertinent Information: Added information on the Significant APP Amendment application (date application received, public notice date, and permit signature date).

In addition, relevant permit language has been changed to conform to the current APP format.

## II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)

The WRF shall be designed, constructed, operated, and maintained to meet the treatment performance criteria for new facilities as specified in A.A.C. R18-9-B204. In this significant APP amendment the Facility is being expanded with the addition of two new 2.0 MGD oxidation ditch treatment trains. New filtration and ultra violet disinfection equipment is also being added. All components of the treatment plant meet the liner requirement in Section R18-9B204 (B) (7). According to A.A.C. R18-9-B204 (B)(4)(iii), the permittee has opted to use the alternative indicator monitoring and ADEQ has approved the reduction in monitoring of *E. coli* from daily to weekly, if the 60 day test report demonstrates non-detect limits for *E. coli* levels. If the UV dose or UV transmittance falls below alert levels, the permittee shall conduct verification sampling according to contingency plan described in Section 2.6.2.2.2.

The permittee has provided the UV disinfection unit which will have continuous monitoring for UV transmittance and UV dose. The UV system is designed to deliver a UV dose of 100 mJ/cm<sup>2</sup>. The manufacturer of UV system has performed tests which show that the non-detect limits for *E. coli* can be achieved with the UV dose lower than 90 mJ/cm<sup>2</sup> and with UV transmittance of 65%. The permittee will be monitoring continuously for UV transmittance and UV dose. The alert level for UV transmittance will be 65% and alert level for UV dose will be 90 mJ/cm<sup>2</sup>.

## III. HYDROGEOLOGIC SETTING

The Pima County Avra Valley WRF is located in the southeastern portion of Avra Valley sub-basin of the Tucson Active Management Area (AMA) within the Santa Cruz Watershed. Avra Valley is an alluvial basin located within the Basin and Range Physiographic Province. The Basin and Range Physiographic Province is defined by uplifted blocks or mountain ranges with intervening alluvial basins or valleys, created by extensional (pull apart) faulting. The elongated basins and ranges typically trend northwest-southeast and parallel one another. Avra Valley is bounded by the Tucson Mountains on the northeast, Sierrita Mountains on the south and Silverbell Mountains on the northwest. Alluvial deposits within the basin are generally 2000 feet thick and have been divided into three Cenozoic stratigraphic units called, from uppermost to lowermost, the Fort Lowell Formation, Tinaja Beds, and Pantano Formation.

Groundwater is present in the alluvium under unconfined and confined conditions and generally flows north-northwesterly. Unconfined groundwater was originally encountered at depths of about 300 feet in the area, but the water table has declined due to agricultural pumping in the area. Groundwater is flowing northwest beneath the WRF at a depth of approximately 415 feet below the land surface. Groundwater monitoring is required at the point of compliance wells.

## IV. STORM WATER/SURFACE WATER CONSIDERATIONS

The WRF is located within the floodway associated with northward trending ephemeral Blackwash, which is tributary to ephemeral Brawley Wash (sometimes called Altar Wash), located within the Blackwash sub-basin (HUC-10) of the Upper Santa Cruz River surface water basin. Blackwash is an unlisted tributary to Brawley Wash listed in the Surface Water Quality Standards Rules (A.A.C. R18-11-101 et seq). Applicable designated uses within the Surface Water Quality Standards (SWQS) are ephemeral aquatic and wildlife (A&W<sub>e</sub>) and partial body contact.

The WRF is protected from flooding by berms that are designed to divert flood waters around the facility. The 100-year flood elevation ranges from approximately 2355 feet to 2358 feet near the facility. The berms provide a minimum of one foot of freeboard along the southern and eastern sides (upstream) of the facility above the estimated elevation of the 100-year storm event.

**V. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS**

The permittee is required to show that pollutants discharged will not cause or contribute to a violation of aquifer water quality standards at the POC. The location of the points of compliance (POCs) which show compliance with aquifer water quality standards is determined by an analysis of the pollutant management area (PMA), the discharge impact area (DIA), and locations and uses of groundwater wells in the area. The POC locations are selected to protect off-site uses of groundwater, to verify BADCT performance, and to allow early detection of potential impact from the WRF discharges.

**Monitoring and Reporting Requirements**

Effluent, reclaimed water and groundwater monitoring are required for this facility as follows: Groundwater monitoring under (Table IIA) POC#1 will continue only until POC #3 (Table IIC) has been commenced. Groundwater monitoring under Table IIB is required as a contingency when the discharge from outfall #7 exceeds 250,000 gpd averaged over a 90 day period. Groundwater monitoring under Table IIC (POC #3) is required within 6 months of the permit issuance date or within 90 days of exceedance of the 250,000 gpd limit from outfall #6, averaged over a 90 day period.

The purpose of the discharge monitoring tables is explained below:

<b>Monitoring Table</b>	<b>Constituents</b>	<b>Monitoring for Disposal Sites</b>
I	BOD, TSS, <i>E. coli</i> , total nitrogen, nitrate-nitrite, and Kjeldahl nitrogen	New facility start-up monitoring.
IA	Flow, total nitrogen, nitrate-nitrite as N, VOCs, metals, major cations/anions, <i>E. coli</i> , and UV Transmittance, and UV Dosage	Monitoring for percolation basins and Blackwash Spray Fields
IB	<i>E. coli</i> , and total nitrogen	Class B+ Reclaimed Water Uses
IC	<i>E. coli</i> , UV Transmittance, and UV Dosage	60 day test for alternative indicator parameters monitoring.

Monitoring Frequency for Parameters:

Parameter	Effluent	Reclaimed Water (Class B+)	Groundwater: POC 1, 2 & 3
Effluent Flow	Daily, Calculated Monthly	Daily; Calculated Monthly	Not Applicable
nutrients: total nitrogen, nitrate-nitrite as N, TKN (nitrate as N, as applicable)	Monthly	Monthly	Monthly
Inorganic chemicals as listed in A.A.C. R18-9-1-406.B: antimony, arsenic, barium, beryllium, cadmium, free cyanide, fluoride, lead, mercury, nickel, selenium, and thallium.	Quarterly	N/A	Quarterly
<i>E. coli</i>	Weekly	Daily	Monthly (Total coliform)
VOCs and semi-VOCs as listed in AAC R-18-11-406.C	Semi-annually	N/A	Semi-annually
Major cations/anions	Quarterly	N/A	Quarterly

**Point(s) of Compliance (POC)**

For each compliance schedule item listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Section. A copy of the cover letter must also be submitted to the Water Quality Compliance Section, Enforcement Unit.

The three hazardous points of compliance (POCs) are designated at the following locations:

Sampling Point #	Descriptive Location	Latitude	Longitude
1	POC - Well # 24 (AV-03): AD WR Well # 55-520125. POC established near the center east side of percolation basin #3. Downgradient [See Table IIA]	32° 10' 07" N	111° 10' 59" W
2	POC 2 - Well #21 -Cowboy Haven Well is approximately 1260' west/northwest of AZPDES Outfall 7, one mile Northwest of the WRF on the edge of PMA. The distance from the edge of the PMA to the Cowboy Well is approximately 700' west/northwest. ( also known as ADWR Well #55-632420)	32° 09' 50.45" N	111° 11' 38.5" W
3	POC – Well #22 will be installed at the northwest corner of future basin # 6d to provide a POC upon completion of percolation basins # 6a – 6d.	32° 10' 05" N	111° 11' 05" W

The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

Groundwater monitoring shall be conducted under (Table IIA). Monitoring at POC#1 will continue only until monitoring under POC #3 (Table IIC) has been commenced. Groundwater monitoring under Table IIB is required as a contingency when the discharge from outfall #7 exceeds 250,000 gpd averaged over a 90 day period. Ground water monitoring under Table IIC (POC #3) is required within 6 months of the permit issuance date or within 90 days of exceedance of the 250,000 gpd limit from outfall #6, averaged over a 90 day period.

## **VI. COMPLIANCE SCHEDULE**

A compliance schedule is included in Section 3.0 of the permit which includes the requirement for submittal of an Engineer's Certificate of Completion, new facility start-up provisions, and the installation of new POC # 3 (well #22) monitoring well.

## **VII. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT**

### **Technical Capability**

Pima County has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202 (B). The WRF modification was designed as per the design report prepared by James W. Dettmer, AZ Registered Professional Engineer No. 27864, dated July 24, 2007. ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. The permittee is expected to maintain technical capability throughout the life of the facility. The WRF was designed as per the design report prepared, stamped, and signed July 24, 2007 by James W. Dettmer, AZ Registered Professional Engineer No. 27864.

### **Financial Capability**

The permittee has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The permittee shall maintain financial capability throughout the life of the facility. The estimated dollar amount demonstrated for closure and post closure cost estimates is \$20,480,000.00. The financial capability was demonstrated through A.A.C. R18-9-A203 (B)(2).

### **Zoning Requirements**

The Pima County Avra Valley WRF has been properly zoned for the permitted use and the permittee has complied with all zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201 (B) (3).

## **VIII. ADMINISTRATIVE INFORMATION**

### **Public Notice (A.A.C. R18-9-108(A))**

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

**Public Comment Period (A.A.C. R18-9-109(A))**

The aquifer protection program rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

**Public Hearing (A.A.C R18-9-109(B))**

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

**IX. ADDITIONAL INFORMATION**

Additional information relating to this permit may be obtained from:

Arizona Department of Environmental Quality  
Water Quality Division - Groundwater Section - APP and Reuse Unit  
Attn: Monica Phillips  
1110 West Washington Street, Mail Code 5415B-3  
Phoenix, Arizona 85007  
Phone: (602) 771-2253