



Fact Sheet

Aquifer Protection Permit 100983
Place ID #1213, LTF #49480
SIGNIFICANT AMENDMENT
City of Bisbee San Jose WWTF

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 Arizona Administrative Code (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., 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.

I. FACILITY INFORMATION

Name and Location

Name of Permittee:	City of Bisbee
Mailing Address:	118 Arizona Street Bisbee, Arizona 85603
Facility Name and Location:	San Jose Wastewater Treatment Facility 940 Purdy Lane Bisbee, Arizona

Regulatory Status

A Notice of Disposal (NOD) was filed for the City of Bisbee San Jose Wastewater Treatment Facility (WWTF) on January 18, 1985. The original Aquifer Protection Permit (APP) application was submitted to ADEQ on September 20, 1993, however the APP was not issued. The facility operated under consent orders from September 9, 1996 to July 25, 2006, which is the date of the first APP issued for this facility. An application for an "other" amendment to classify the treatment facility for Class B+ reclaimed water was received by ADEQ on February 4, 2009. A subsequent request from the permittee to reduce the frequencies of selected monitoring parameters resulted in changing the amendment category from an "other" amendment to a "significant" amendment.

Facility Description

The City of Bisbee is authorized to operate the San Jose Wastewater Treatment Facility (WWTF) with a permitted capacity to collect and treat a maximum average monthly flow of 1.22 million gallons per day (mgd). The WWTF consists of an influent lift station, a septage receiving station, headworks with bar screen and grit removal, sequencing batch reactors with surge basins for biological treatment including nitrification-denitrification, ultraviolet (UV) disinfection, aerobic sludge digesters, a sludge dewatering belt filter press, and an effluent reuse pump station. All treatment units are constructed of either reinforced concrete or steel tanks. The wastewater treated at this facility is typical domestic sewage from residential and commercial areas in the city of Bisbee. The WWTP is rated as producing Class B+ reclaimed water. Excess effluent not needed for reuse may be conveyed approximately 1.5 miles southwest to an outfall in Greenbush Draw where it may be discharged pursuant to AZPDES Permit No. AZ0025275. Sludge is thickened, dewatered, and transported to an approved landfill in accordance with state and federal regulations.

At the site, there are two treatment lagoons and one polishing pond which are currently (at permit issuance) undergoing clean-closure review by ADEQ. Upon clean-closure approval, the permittee may apply for a permit amendment to include the use of one of these lagoons for emergency effluent storage.

The permittee shall notify all users that materials authorized to be disposed of through the WRP are domestic strength wastewater and pre-treated commercial wastewater and shall not include motor oil, gasoline, paints, varnishes, hazardous wastes, solvents, pesticides, fertilizers or other materials not generally associated with toilet flushing, food preparation, laundry facilities and personal hygiene.

In addition to the APP conditions pertaining to treatment and disposal of sewage sludge, the permittee must also comply with the requirements for any sewage sludge disposal in 40 Code of Federal Regulations (CFR) Part 503 and 18 A.A.C. Ch. 9, Art. 10.

Amendment Description

This permit amendment was requested by the permittee to classify the WWTF for Class B+ reclaimed water, and to remove compliance schedule items which have been fulfilled. Subsequent to submitting the application, the permittee also requested to reduce selected monitoring frequencies due to the demonstration of the facility to consistently meet BADCT and Aquifer Water Quality Standards, and due to the addition of reclaimed water reuse as a method of disposal, thereby significantly reducing the discharge to Greenbush Draw.

Listed below are the changes to the permit as a result of this amendment:

1. Section 2.1, Facility/Site Description: This Section was updated; Added classification for Class B+ reclaimed water; Added description of the two treatment lagoons and one

polishing pond currently (at permit issuance) undergoing clean-closure review, and upon approval, the permittee may apply for a permit amendment to include the use of one of these lagoons for emergency effluent storage.

2. Section 2.2.2, Site-specific Characteristics: Updated to describe general characteristics of the groundwater; Deleted description of Soil Aquifer Treatment (SAT) as it applied to the start-up period and is no longer applicable.
3. Section 2.2.3, Pre-operational Requirements: Changed to “Not applicable”.
4. Section 2.2.4.1, Special Start-up Provisions: Deleted this sub-section as it is no longer applicable.
5. Section 2.2.5, Wastewater Treatment Facility Classification: Changed heading to read, Reclaimed Water Classification, and replaced existing language with description of the Class B+ reclaimed water classification. (Previously this section described the steps to take to amend the permit to include classifying the treatment facility for Class B+ reclaimed water.)
6. Added Section 2.2.6, Certified Areawide Water Quality Management Plan Conformance.
7. Section 2.3, Discharge Limitations: In #1, clarified the flow limit to be a maximum average monthly flow (rather than previous language which described it as a maximum average daily flow).
8. Section 2.5, Monitoring Requirements: Deleted sub-section 2.5.1.1 (Soil Aquifer Treatment), as it applied to the start-up period and is no longer applicable. Added a sub-section for Reclaimed Water Monitoring (Section 2.5.3), and re-ordered the sub-sections accordingly. Added mention of the Sentinel Well Monitoring in the Groundwater Monitoring sub-section (2.5.4).
9. Section 2.6.3, Discharge Limitations (DL) Violations: Deleted sub-section 2.6.3.1, Contingencies for DL Violations following the initial Start-up Period, as it is no longer applicable.
10. Section 2.7.4, Operational, Other or Miscellaneous Reporting: Deleted requirement to evaluate alternative disposal methods, as this has been completed.
11. Section 2.11, Special Provisions: Deleted this section, as all three items have been completed.
12. Section 3.0, Compliance Schedule: Deleted previous language, and replaced it with the following: All compliance schedule items listed in the previous permit have been completed and removed from this permit, except the requirement in #2 to monitor the

sentinel well. This is a routine permit monitoring requirement and has been moved to Section 4.2, Table IIB.

13. Section 4.0, Tables of Monitoring Requirements: Added sub-sections 4.1, Pre-operational Monitoring, (which is not applicable), and 4.2, Compliance or Operational Monitoring. Under 4.2, the tables have been renamed and reordered to reflect the following configuration:

- Table IA - The previous Table IA which was for the first year only has been removed and replaced with Table IA, Routine Discharge Monitoring.
- Table IB - Class B+ Reclaimed Water Monitoring
- Table IIA - Groundwater Monitoring at POC Well #1
- Table IIB - Groundwater Monitoring at the sentinel well
- Table III - Facility Inspection (Operational Monitoring)

14. Section 4.2, Table IA, Discharge Monitoring - Reduced cation/anion monitoring frequency from quarterly to annually, and VOCs from semi-annually to annually.

15. Section 4.2, Table IIA, Groundwater Monitoring (POC Well #1) - Reduced the monitoring frequencies for cation/anions and metals from quarterly to annually, and VOCs and radionuclides from semi-annually to annually.

16. Section 4.2, Table IIB, Sentinel Well - Reduced the monitoring frequencies for *E. coli* from weekly to monthly, and total nitrogen from monthly to quarterly.

17. Changed all references to the Water Permits Section to read "*Groundwater Section*".

18. Other changes include change in permit language to conform to the most current permit format.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY

The WWTF is designed and constructed, operated, and maintained to achieve the treatment performance criteria for new facilities as specified in A.A.C. R18-9-B204.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Monitoring and Reporting Requirements

To ensure that site operations do not violate Aquifer Water Quality Standards at the point of compliance, representative samples of the effluent shall be collected immediately downstream from the UV disinfection unit. The permittee shall monitor the effluent daily for *E. coli*, monthly for total nitrogen, semi-annually for radionuclides, and annually for

cations/anions and volatile organic compounds (VOCs) (see Section 4.2, Table IA in the permit).

To ensure that site operations do not violate the Reclaimed Water Quality Standards for the beneficial use of Class B+ reclaimed water, the permittee shall monitor the reclaimed water at the same effluent sampling point as indicated above. The permittee shall monitor the reclaimed water daily for *E. coli* and monthly for total nitrogen (see Section 4.2, Table IB in the permit).

To ensure that the aquifer is not being impacted, the permittee shall monitor the groundwater at point of compliance well #1. The permittee shall monitor the groundwater monthly for total nitrogen, nitrate-nitrite as N, total Kjeldahl nitrogen (TKN), and total coliform, and annually for metals, cations/anions, radionuclides, and VOCs (see Section 4.2, Table IIA in the permit).

In addition, the permittee shall monitor the groundwater at the sentinel well which has been installed to ensure that the discharge into Greenbush Draw does not impact the aquifer at the nearest Arizona Water Company well. The permittee shall monitor the groundwater monthly for *E. coli*, and quarterly for total nitrogen (see Section 4.2, Table IIB in the permit).

Facility inspection and operational monitoring shall be performed on a routine basis (see Section 4.2, Table III in the permit).

Point of Compliance (POC)

The hazardous/non-hazardous POC locations are based on the delineations of the pollutant management areas (surficial areas on which wastewater is treated and discharged) at the WWTF site and within Greenbush Draw, the direction of groundwater flow, and the infiltration analyses. Two pollutant management areas have been delineated for the San Jose WWTF. The property boundary was used to delineate the PMA for the WWTF site. The lineal extent of reclaimed water flow in Greenbush Draw from the AZPDES outfall was used to delineate the second PMA. An evaluation of the potential areas of groundwater impact included conducting infiltration tests along Greenbush Draw, conducting a stream flow analysis, reviewing soil aquifer treatment studies, and evaluating local hydrology. Based on this analysis, 100 % of the effluent will infiltrate into the subsurface of Greenbush Draw within 5.2 to 5.9 miles from the proposed outfall assuming high-end infiltration rates and within 9.2 to 10.7 miles using low-end infiltration rates. The maximum conservative travel distance of 10.7 miles from the AZPDES outfall was selected to define the PMA in Greenbush Draw. The Discharge Impact Area (DIA) for both PMAs is described as similar in shape and size with each designated PMA.

The POCs are designated at the downgradient edge of the PMA for the WWTF and near the downstream/downgradient edge of the AZPDES outfall to allow for early detection of contaminant migration and at the lineal extent of the PMA boundary as required by A.R.S. 49-244. The hazardous/non-hazardous POCs are identified below:

POC#	POC Locations	Latitude	Longitude
1	Monitor well located ~ 700' downgradient of the AZPDES outfall in Greenbush Draw	31° 20' 36" N	109° 56' 18" W
2	Conceptual point at the downgradient boundary of the pollutant management area (PMA), which is ~ 750' downgradient of the calculated maximum lineal extent of flow of effluent within Greenbush Draw	31° 23' 34" N	110° 05' 05" W
3	Conceptual point at the southwest boundary of the WWTF	31° 21' 26" N	109° 55' 06" W

Groundwater monitoring is required at POC #1 (see Section 4.2, Table IIA). Aquifer quality limits (AQLs) were set at the applicable AWQS for groundwater based on data collected from downgradient drinking water wells. Alert levels were set at 80% of the AQLs. Monitoring for major cations and anions is included to characterize the groundwater and the effluent. The groundwater characterization is used to evaluate when recharged effluent is detected in groundwater at the POC.

A “sentinel well” was installed within 500 feet of the nearest Arizona Water Company well, between Greenbush Draw and the Arizona Water Company wellfield, in a location agreed upon by the permittee, Arizona Water Company, and ADEQ. The permittee shall immediately report any exceedances of 5.0 mg/l for total nitrogen and any presence of *E.coli* in the sentinel well to both ADEQ and Arizona Water Company.

Groundwater monitoring at POC nos. 2 and 3 are not required at permit issuance. The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

IV. HYDROGEOLOGIC SETTING

The San Jose WWTF is located in the Sierra Vista sub-basin of the Upper San Pedro groundwater basin within the San Pedro Watershed. This aquifer is composed of three distinct units called the Basin Fill Deposits, Morita Formation, and Glance Conglomerate. The main water-bearing unit is the Basin Fill Deposits which provides ~95% of the water for domestic purposes in the area.

Faults in the area can act as barriers to groundwater flow. The nearest fault, the Black Gap Fault, located ~¼ mile east of the WWTF acts as a barrier to groundwater flow with depths-to-groundwater on the east side of the fault more than 100 feet deeper than on the west side. Groundwater on both sides of the fault, including beneath the facility, flows southward to Greenbush Draw. As groundwater nears Greenbush Draw, the center of the basin, it turns westward, similar to topography and surface water drainages.

The depth-to-groundwater beneath the facility is estimated to range from 200-240 feet below land surface (bls). Depth-to-groundwater near the outfall in Greenbush Draw is estimated to be ~120 feet bls with a westward groundwater flow direction similar to the surface water flow direction within Greenbush Draw.

Eighty-seven wells are registered with the Arizona Department of Water Resources (ADWR) within sections 1-17 in T24S, T24E, near the San Jose WWTF. According to ADWR, 22 wells are located within one mile and five wells are located within a ½-mile radius of the WWTF. Most of the wells are used for monitoring purposes.

The Bisbee-Naco aquifer is a sole source aquifer as defined by Section 1424(e) of the Safe Drinking Water Act, which means that the aquifer within the basin is the only source of drinking water in the area. Contamination or overdraft of this aquifer endangers the drinking water supply for the area.

Wells used for domestic drinking water purposes are located approximately one mile south (downgradient) and 0.75 miles north-northwest (upgradient) of the WWTF. The nearest public water supply wells are located approximately 1.5 miles east-southeast (upgradient) at Bisbee Junction and southwest (downgradient) adjacent to Greenbush Draw near the town of Naco. Potable water service to the town of Bisbee is provided via wells operated by the Arizona Water Company wells located approximately one mile northwest of Naco, Arizona.

V. STORM WATER AND SURFACE WATER CONSIDERATIONS

The San Jose WWTF is located in the Greenbush Draw portion of the Upper San Pedro sub-basin of the San Pedro surface water basin. The principal surface drainage feature in the basin is Greenbush Draw, which originates southeast of the community of San Jose. Greenbush Draw traverses west/northwest from San Jose, downstream to flow along the northern edge of the Town of Naco before its confluence with the San Pedro River. Several unnamed, ephemeral tributaries flow toward Greenbush Draw from the north and the south. On average, flow is only observed in Greenbush Draw during the months between June and October, which is generally consistent with the period of major climatic precipitation. The confluence of Greenbush Draw and the San Pedro River is located ~13 miles downgradient (west) from the discharge outfall for the new San Jose WWTF.

The San Jose WWTF is not located in a 100-year flood plain. The nearest 100-year flood plain is associated with an unnamed, ephemeral wash located ~½ mile west of the site. The WWTF site is protected from run-on due to storm events.

VI. COMPLIANCE SCHEDULE

All compliance schedule items listed in the previous permit have been completed and removed, except the requirement in #2 to monitor the sentinel well. This is ongoing permit monitoring requirement and has been moved to Section 4.2, Table IIB.

VII. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

The City of Bisbee 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 permit requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an on-going demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

The City of Bisbee has demonstrated the financial responsibility 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-A203. The permittee is expected to maintain financial capability throughout the life of the facility.

Zoning Requirements

The City of Bisbee San Jose WWTF has been properly zoned for the permitted use and the permittee has complied with applicable zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201(A)(2)(c).

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 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. 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.

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

The Department shall accept written comments from the public before a significant permit amendment is made. The written public comment period begins on the publication date of the public notice and extends for 30 calendar days. 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 proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division - APP and Reuse Unit
Attn: Marcy Mullins
1110 W. Washington Street, Mail Code 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771-4464