

**KARTCHNER CAVERNS STATE PARK WASTEWATER TREATMENT FACILITY**

Aquifer Protection Permit No. P-102768

Place ID 6672, LTF No. 99716

**New Permit**

**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:**

Name of Permittee:	Arizona State Parks & Trails
Permittee Address:	1400 W. Washington Street; Suite 100 Phoenix, Arizona 85007
Facility Name: Location:	Kartchner Caverns State Park Wastewater Treatment Facility (WWTF) 2980 Highway 90 Benson, Arizona 85602 Cochise County
Groundwater Basin:	Over the groundwater of the of the Upper San Pedro Basin

**III. Facility Description:**

The permittee is authorized to operate the Kartchner Caverns State Park Wastewater Treatment Facility (WWTF), with a maximum average monthly flow of 17,500 gallons per day (gpd). The Department has graded this facility as a Grade 2 wastewater treatment plant (WWTP). The facility shall have an operator in direct responsible charge who is certified for the grade of the facility and inspects the facility weekly for a Grade 2 WWTP.

The facility is designed to treat wastewater from the Kartchner Caverns State Park utilizing two AquaPoint Bioclere Wastewater Treatment Systems. Sewage gravity flows by gravity into an influent wetwell through a constructed basket, that is lifted by a pulley to remove screenings. From the wetwell, an influent lift station, with two 58gpm (2.0Hp) pumps, lift sewage through an influent flowmeter to two 25,000-gallon primary settling tanks that operate in series to maximize the removal of solids, but have piping/valves so that each may be taken offline temporarily for maintenance. From the primary settling tanks, primary effluent is lifted with two (2) 0.4-HP 30 gpm submersible pumps to two (2) 36/24 model Bioclere units operated in parallel utilizing a modified fixed-film trickling system, each contain a 3,500 gallon secondary clarifier. Two alternating submersible 1-HP dosing pumps that are located in the center baffle, continuously dose the trickling filter media. This flow is uniformly distributed over the entire filter surface using a

PVC dosing array and fixed nozzles that are constructed of nylon. Recirculation of sludge and treated wastewater is accomplished in each Bioclere unit by using a 1-HP submersible recycle pump located at the bottom of the secondary clarifier of the system. Internal baffling is provided in the secondary clarifier to prevent short-circuiting of wastewater and biological solids. The biological solids sloughed off in the filter are returned to and captured in the primary settling tank every hour. Denitrification in the Bioclere system is accomplished by periodically recirculating secondary sludge and treated nitrified effluent to the primary settling tank where anoxic conditions are sustained. From the secondary clarifier the treated effluent travels by gravity through a UV disinfection unit. A back-up tablet chlorinator is located in series after the UV system to provide a redundant system for disinfection when the UV system is not meeting the needs due to the lack of filtration or needs to be taken offline temporarily for maintenance or repairs. After disinfection, treated effluent gravity flows into an effluent wetwell and lift station equipped, with two (7.5Hp) pumps and an effluent flowmeter, that discharges to a field of native trees with 640 bubbler drip irrigation emitters.

All the screenings, sludge and scum, will be hauled off-site for management or disposal in accordance with state and federal regulations.

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:

Table 1: DISCHARGING FACILITIES		
Facility	Latitude	Longitude
Kartchner Caverns State Park WWTF	31° 50' 1.4" N	110° 20' 44.6" W
Bubbler Drip Irrigation Emitter Field	31° 50' 4.8" N	110° 20' 44.0" W

#### IV. Best Available Demonstrated Control Technology (BADCT):

The treatment facility 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. 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 facility will:

- Be constructed with Duty and standby unit processes capable of treating raw wastewater with one unit out of service ultimately based around increased facility reliability and redundancy.
- Denitrify the effluent to below 10 mg/l for total nitrogen.
- This new technology from AquaPoint Bioclere Wastewater Treatment Systems claims to be able to use fixed-film technology to denitrify the effluent to below 10 mg/l for total nitrogen which meets BADCT requirements without an additional carbon feed source;
- There is no reuse component nor classification of effluent;

- Will disinfect through UV disinfection without filtration, so a back-up chlorine tablet feeder will be installed in series after the UV system. Dechlorination of effluent prior to discharging is not required.
- This new facility is at a State Park in a remote location, so full noise, odor, and aesthetic setbacks were met and odor and noise controls were not required.
- The WWTF was designed as per the design report and design plans signed, dated, and sealed by Brandon Lee Squire, P.E. (Civil#35177) with EPS Group, Inc. on October 10, 2023 and Michael E Lotempio, P.E. (Civil #43727) with EPS Group, Inc. on May 25, 2023, respectively and subsequent sealed submittals that served as additions to the design report.

**V. Compliance with Aquifer Water Quality Standards (AWQS):**

The permittee shall monitor the effluent according to Section 4.2, Table 7: ROUTINE DISCHARGE MONITORING. Representative samples of the effluent shall be collected at the location downstream of the UV disinfection system and back-up tablet chlorinator. Flow estimations will be performed by monitoring the discharge flowmeter sensor located at the existing effluent lift station.

Groundwater monitoring is not required under the terms of the permit.

The Points of Compliance (POCs) have been established at the following locations:

Table 2: POINT(S) OF COMPLIANCE			
POC #	POC Location	Latitude	Longitude
1 (Conceptual)	Southeast edge of the discharge field	31° 50' 3.9" N	110° 20' 43.8" W

The depth to groundwater is approximately 400 feet below the ground surface, and the direction of groundwater flow is to the southeast near the WWTF and the discharge field.

Groundwater monitoring is not required at the point of compliance wells. POC #1 well is a conceptual well, monitoring is not required except as a contingency action. The director may require an amendment of this permit to install a monitoring well if there is cause or concern that groundwater quality may be impacted at the POC. The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.