

KARTCHNER CAVERNS STATE PARK WASTEWATER TREATMENT FACILITY

Aquifer Protection Permit No. P-102768

Place ID 6672, LTF No. 115841

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:

Arizona State Parks and Trails
Kartchner Caverns State Park
2980 Highway 90
Benson, Arizona 85602
Cochise County

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 14,500 gallons per day (gpd). The Department has graded this facility as a Grade 2 wastewater treatment plant (WWTP). The facility is designed to treat wastewater from the Kartchner Caverns State Park utilizing a Sequencing Batch Reactor (SBR) with migrating biofilm carriers (MBC) to produce a sufficient population to treat the high strength wastewater. 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 58 gpm (2.0-hp) pumps, lifts sewage through an influent flowmeter into a 14,500 gallon equalization (EQ) tank with three installed EQ pumps (plus, one shelf spare) and a mixer. From the EQ tank, influent flows to a 14,500 gallon SBR tank equipped with a mixer, six coarse aeration diffusers legs, and a submersible mixer. A pump in the SBR tank pumps the delivers activated sludge to the MBC skid with two hydro-cyclones and a 4.069-gallon sludge holding tank with decanting abilities, to screen the MBC from the WAS. From the SBR tank, a decanter allows treated effluent to flow by gravity into an effluent wetwell and effluent pump station equipped, with two 7.5-hp pumps and an effluent flowmeter. Effluent from the pump station flows through an ultraviolet (UV) disinfection system and then discharges to a disposal field with subsurface drip irrigation emitters, to irrigate native trees. A six-inch back-up tablet chlorinator is located just after the SBR tanks 4-inch decanter prior to the eight-inch gravity effluent line to provide a redundant disinfection system when the UV system needs to be taken offline temporarily for maintenance or repairs.

IV. Amendment Description:

Arizona State Parks and Trails submitted an amendment application for Kartchner Caverns State Park Wastewater Treatment facility to make treatment process modifications to the plant to treat the high strength wastewater. The treatment process modifications are centered around two main goals: intensifying microbiology to produce a sufficient population to treat the high strength wastewater in the existing tankage and providing a process that is flexible to adjust with the wide range of influent flow into the plant. To achieve these goals the following modifications are approved:

- Conversion of one of the primary tanks into an equalization tank complete with equalization pumps and a mixer
- Conversion of the other primary tank into a sequencing batch reactor
- Addition of components necessary for intensified biological sequence batch reactor operation:
 - o Decanter
 - o Coarse bubble aeration
 - o Submersible mixer
 - o Waste activated sludge pump
 - o Intensification process skid for gravimetric sludge selection to promote granular sludge
 - o Intensification of the batch tank through the addition of mobile biofilm carriers
- Relocation (to downstream of the existing effluent pump station) of the existing inline UV disinfection system for better access and maintenance
- Continued use of the existing influent pump station, effluent pump station, and drip irrigation field for effluent disposal (not reuse)
- Sludge handling consisting of a sludge holding tank, located on the intensification process skid

The modifications to the treatment facility are material and substantial alterations or additions to the facility, which justify a change in permit conditions, and requires a significant amendment to the permit per A.A.C. R18-9-A211(B)(2)(9).

V. 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).

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

The permittee shall monitor the effluent according to Section 4.2, **Error! Reference source not found..** Representative samples of the effluent shall be collected downstream of the UV disinfection system. Flow estimations will be performed by monitoring the discharge flowmeter sensor located at the existing effluent lift station.

One Point of Compliance (POC) has been established at the following location:

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. POC #1 is a conceptual well location; 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.