Total Residual Chlorine New Permit Limitation

El Dorado School District

Old Union School Wastewater Treatment Plant Discharge

NPDES Permit No. AR0051811

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Background Information: The Old Union School is served by a sewer system operated by the El Dorado School District. The sewer system includes a building sewer connected to the Old Union Elementary School and one home next to the school. One sanitary sewer service line, 4-inches in diameter, flows by gravity from the school and the adjacent home into a package wastewater treatment plant with a design capacity of 2,000 gpd.

Every five years, the plant discharge permit must be renewed by the Arkansas Department of Environmental Quality (ADEQ). During each permit renewal cycle, the wastewater plant discharge limitations are evaluated by ADEQ. The current permit became effective on August 1, 2016, and contains a new discharge limitation. The wastewater plant effluent new limit is for Total Residual Chlorine (TRC) that must achieve a chlorine limit of almost zero (0.033 mg/L TRC). The School District has been given until September 30, 2016, to present a Best Management Practice (BMP) for achieving this new TRC limit. The TRC compliance schedule included in the NPDES Permit is shown below.

“SECTION B. PERMIT COMPLIANCE SCHEDULE”

“Within 60 days of the effective date of the permit, the permittee must submit a plan for compliance with the development and implementation of Best Management Practices (BMPs) for the reduction of Total Residual Chlorine (TRC) in the effluent according to Part II Condition No. 5. The plan should include each BMP that will be developed and implemented to reduce the amount of TRC in the effluent to non-toxic levels. In addition, the permittee must submit a schedule describing the time needed to implement the BMPs, with an estimated date that the reduced TRC levels will be achieved.”
This Report includes a BMP for achieving a chorine residual at the Old Union Package Wastewater Plant of no more than 0.033 mg/L, TRC.

**Existing Disinfection System Description:** The Old Union Wastewater Plant currently utilizes chlorine tablets to achieve disinfection of the wastewater plant discharge. These chlorine tablets are placed in a tube as illustrated in the following Figure No. 1.

![Figure No. 1](image)

Disinfection Tablet Chlorinators typically use calcium hypochloride (for wastewater plant applications) or trichloro tablets (for water plant and/or pool operations). As the wastewater passes through the chlorinator, the tablets slowly dissolve while chlorine is being added into the water. The addition of chlorine then kills any pathogenic organisms that remain in the plant effluent. After thirty minutes of contact time, with chlorine for disinfection, the wastewater is then discharged into a local drainage ditch.

A wastewater plant TRC at the discharge point is in the 1.0 mg/L range. This residual chlorine must be removed to below 0.033 mg/L from the plant discharge as contained in the current NPDES Permit. The Old Union Wastewater Permit requires a BMP by the end of September 2016, with the School District proposing a compliance schedule for installation of the dechlorination system.

**Recommendations:**

1. The Old Union School NPDES Permit is now requiring the removal of all detectable chlorine before discharge. The wastewater plant disinfection process is designed for a flow rate of 2,000 gallons per day (gpd).

2. The Total Residual Chlorine (TRC) can be removed using several chemicals, including sodium sulfite, through the use of a tablet feeder very similar to the chlorinator unit shown in Figure No. 2. With approval from ADEQ, the Old Union School will purchase a tablet feeder as depicted in Figure No. 2 for use in TRC removal.
3. The Dechlorination Tablet Feeder should be installed in the wastewater plant effluent line downstream of the chlorine contact tank and the effluent flow metering location. The construction of the dechlorination tablet feeder station is estimated at $3,000.00 for purchase and installation of the dechlorination system.