

CITY OF PANGBURN, ARKANSAS SEWAGE POND CONSTRUCTION

During construction of a large primary lagoon and two secondary lagoons in Arkansas, the contractor uncovered fractured sandstone in area where the lagoons were being constructed. Over the years evidence of seepage in this area had been detected.

A comparison of using a compacted clay layer to a GCL was evaluated to "seal off" the exposed sandstone. Although good clay deposits were available within a reasonable hauling distance, the decision to use a GCL with a flexible membrane liner attached to it resulted was the lowest cost alternative. After deciding on the use of a GCL, the job proceeded on time and was completed within budget.

City of Pangburn, Arkansas Sewage Pond Construction



IN Arkansas, the City of Pangburn's wastewater treatment system, a large primary lagoon followed by two secondary lagoons, was constructed in 1981-82. It was funded with a P.L. 92-500 grant from the U.S. Environmental Protection Agency and a loan from the Farmers Home Administration

(FmHA), U.S. Department of Agriculture.

During construction of the system, the contractor uncovered areas of fractured sandstone in the pond bottoms. A change order was prepared requiring the contractor to use impervious material to "seal off" the exposed sandstone. Over the years,

evidence of seeping was discovered north of lagoon No. 2, along a steep cliff, about 10 to 15 feet below the top of the bluff. At the northeast corner of lagoon No. 3, there was evidence of moisture in a deep draw during dry climate conditions.

Eleven monitoring wells were constructed around the total complex in 1995-96, and groundwater testing began. A series of five samplings from September 1995 through February 1996 indicated lagoons two and three leaked. The parameters used to detect wastewater were fecal coliform counts, ammonia as nitrogen and nitrate-nitrite.

The city of Pangburn serves a population of approximately 800, with over 300

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wastewater connections. The city's wastewater treatment is located about 80 feet above Little Red River and about a 1/4 mile south of the stream. The Little Red River is one of two trout streams in Arkansas.

The engineering firm, W. William Graham Jr., Inc. of Little Rock, Arkansas, evaluated the remedial alternatives. Relocating the lagoon would be cost-prohibitive. Land near the site of the existing treatment plant facility is not readily available due to residential development.

A comparison of compacted clay to various types of liners were evaluated. The final decision was to recommend a geosynthetic clay liner (GCL) with a flexible membrane liner attached to it. A combination of CETCO's reinforced Bentomat CL for the

side slopes and non-reinforced Claymax CL for the floor of the lagoons were the lowest cost alternatives.

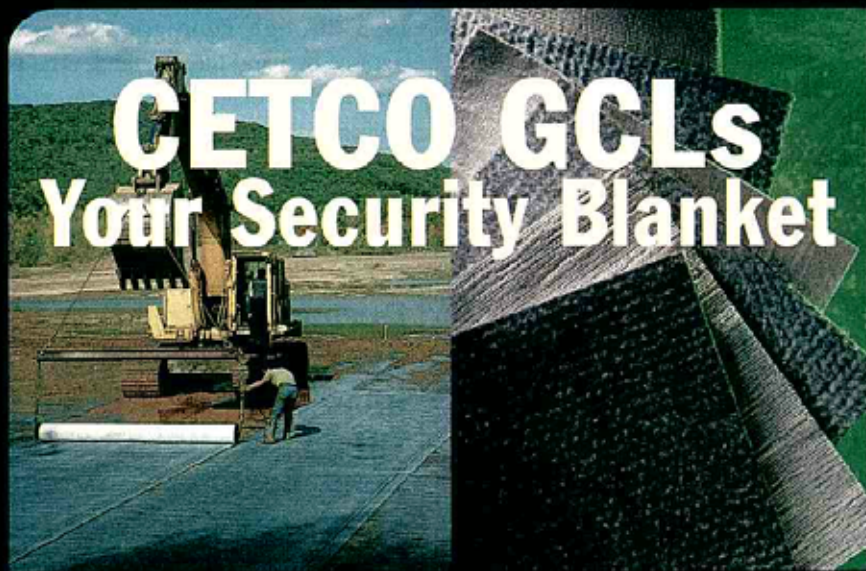
Good, heavy clay deposits are available within reasonable hauling distances. One of the key factors in the cost analysis was the ability of a general contractor to install the GCL with a minimum investment in equipment, as no special tools or devices are required to install the CETCO liner. The contractor for the project, James Franks Co. in Mt. View, Arkansas, fabricated its own spreader bar, based on CETCO's drawings.

The lagoon depth is five to six feet. The CL products, installed over the compacted subgrade and covered with one foot of overexcavated fill, sealed the lagoon with a leakage rate of 50 gallons per acre per day.

Wet weather conditions slowed the initial stages of the project. Once the floor was voided of the wastewater, the heat of 110 degrees helped dry the site, but liner installation was limited to the morning hours. The job was finished on time and within budget.

The project was funded by a grant and loan provided by the Rural Development Administration of the U.S. Department of Agriculture, the successor of FmHA. **L&W**

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