

**Proposed Project for Application to the Kansas Department of Health and Environment
for the Kansas Water Pollution Control Revolving Loan Fund.**

Applicant: City of Wathena
Wastewater Treatment System Improvements
Larkin Project No. KC99-0183.0000
KWPCRF Project No. C20 1525 01

*Mailed
to*

Jay Norco, P.E.
Shafer, Kline, & Warren, Inc.
2940 Main Street
Kansas City, MO 64108-3322

_____ Kansas Geological Survey for environmental review.

Agency Review Comments:

The description of the lagoon site indicates that the ground-water level is approximately 17.5 feet below the average ground elevation. It should be noted that this is based on selected measurements and probably represents the condition during average river flow. The lagoon site is shown on the map as on the floodplain of the Missouri River and overlies the alluvial aquifer in the river valley. The ground-water level in the alluvial aquifer varies with the level of the Missouri River through river-aquifer interaction. Thus, the ground water level can be much higher during high flow events in the river, and could be as high as the surface of the ground during river flooding. The lagoon should be built to consider the effect of potential flooding events of the Missouri River, including potential erosion of the walls of the lagoon by flood waters. In general, the long-term benefits of the improvements to the wastewater treatment system should offset any short-term adverse impacts during construction.

Recommended Action:

- ☒ Clearance of project should be granted
☐ Clearance of project should not be granted
☐ Clearance of project should be delayed until the issues or questions have been clarified
☐ Clearance of project should not be delayed, but the applicant (in the application) should address or clarify the questions or concerns indicated above

Donald Whittemore
Reviewer's Name

Geohydrology Section, Kansas Geological Survey
Division/Agency

1/20/05
Date

Donald Whittemore
Reviewer's Signature



SHAFFER, KLINE & WARREN, INC. ■ 2940 Main Street, Kansas City, Missouri 64108-3322 ■ 816-756-0444 FAX: 816-756-1763

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December 23, 2004

Dr. Lee Allison
Kansas Geological Survey
University of Kansas
1930 Constant Ave.
Campus West
Lawrence, Kansas 66047

RE: Intergovernmental Review for Wastewater Lagoon Expansion
City of Wathena, Kansas

Dear Dr. Allison:

The City of Wathena is preparing for capital improvements to its wastewater treatment system to be financed through a State Revolving Fund Loan. The city has contracted with Shafer, Kline & Warren, Inc. to identify and prioritize improvements needed, design these improvements and prepare construction documents for the improvements. As part of the State Revolving Loan (SRF) process, we are required to obtain comments from various state agencies. Below is a description of the project.

The wastewater system is owned and managed by the City of Wathena and management responsibility is fulfilled by the Wastewater Superintendent. The Wastewater Treatment Facility is located on the southeast side of the City. Below is a brief description of the proposed project.

Construct Wastewater Influent Pumping Station: To transport the municipal wastewater to the new primary lagoon cell, a new pump station will be constructed next to the sewer flowing into the existing primary lagoon cell (on the northwest corner of the existing primary cell). The sewer will then be diverted into the pump station wetwell for conveyance to the new primary lagoon cell. The pump station will contain three (3) submersible non-clog pumps. These pumps will operate alone, or in tandem, with the third pump serving as a dedicated standby. For emergency operation during power outages, an overflow pipe will be provided to allow the wetwell to fill and overflow directly to the secondary lagoon cell (existing primary lagoon cell). This setup will provide an acceptable level of treatment for rare and brief periods when electrical service is interrupted. The pump station will automatically restart when power is restored.

Construct New Primary Wastewater Lagoon Cell: The new primary lagoon cell will be constructed northeast of the existing lagoons on approximately 12 acres of property purchased by the City. Wastewater will be pumped to this cell from the new influent pump station which will be constructed on the influent sewer. The bottom of the new lagoon is set at an elevation of 809.00. Based on geotechnical investigations, the groundwater table is approximately 17.5 feet below the average ground elevation of 811.50. This gives a groundwater table elevation of approximately 794.00, which is greater than the required minimum 10 feet of separation from the lagoon bottom. The new primary lagoon will utilize a clay liner. It is anticipated that some bentonite soil mixing will have to be performed to achieve the

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proper seepage rate of ¼-inch per day (based on the existing design criteria). The berms for the lagoon will have 3:1 side slopes with a top width of 12 feet.

Flow into the lagoon will be via forcemain from the influent pump station. The forcemain will discharge into a headworks box with a manually cleaned bar rack with ¾-inch openings. Effluent from the lagoon will be through a discharge structure which will allow the operator to choose from three elevations to withdraw primary effluent. Flow from the new primary lagoon cell will flow to new inlet box to be constructed at the existing primary lagoon cell. Preliminary design information on the new primary lagoon cell is as follows:

Volume:	9,435,450 gal (1,261,424 ft ³)
Water Depth:	6 feet
Freeboard:	3 feet
Water Surface Area:	5.2 acres (227,050 ft ²)
Bottom Length:	441 feet
Bottom Width:	440 feet

The two existing lagoon cells will continue to operate as the secondary and tertiary facultative lagoon cells. Piping of the existing lagoon cells will be modified to ensure that flow through the lagoons are from corner to corner, creating the longest flow path through the lagoons possible.

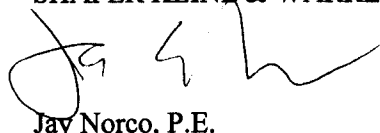
Work at the treatment facility will also include site work, drainage, yard piping, miscellaneous structures, and all appurtenant work.

Access to the site for heavy construction equipment will be via a temporary easement from the north. The existing levee road will not be used for this purpose.

Total project cost, including contingency, administrative, legal, construction and engineering fees, is estimated at approximately \$900,000.

Thank you in advance for your input. If you have any questions regarding this project, please contact me at (816) 460-0397.

SHAFER KLINE & WARREN, INC.

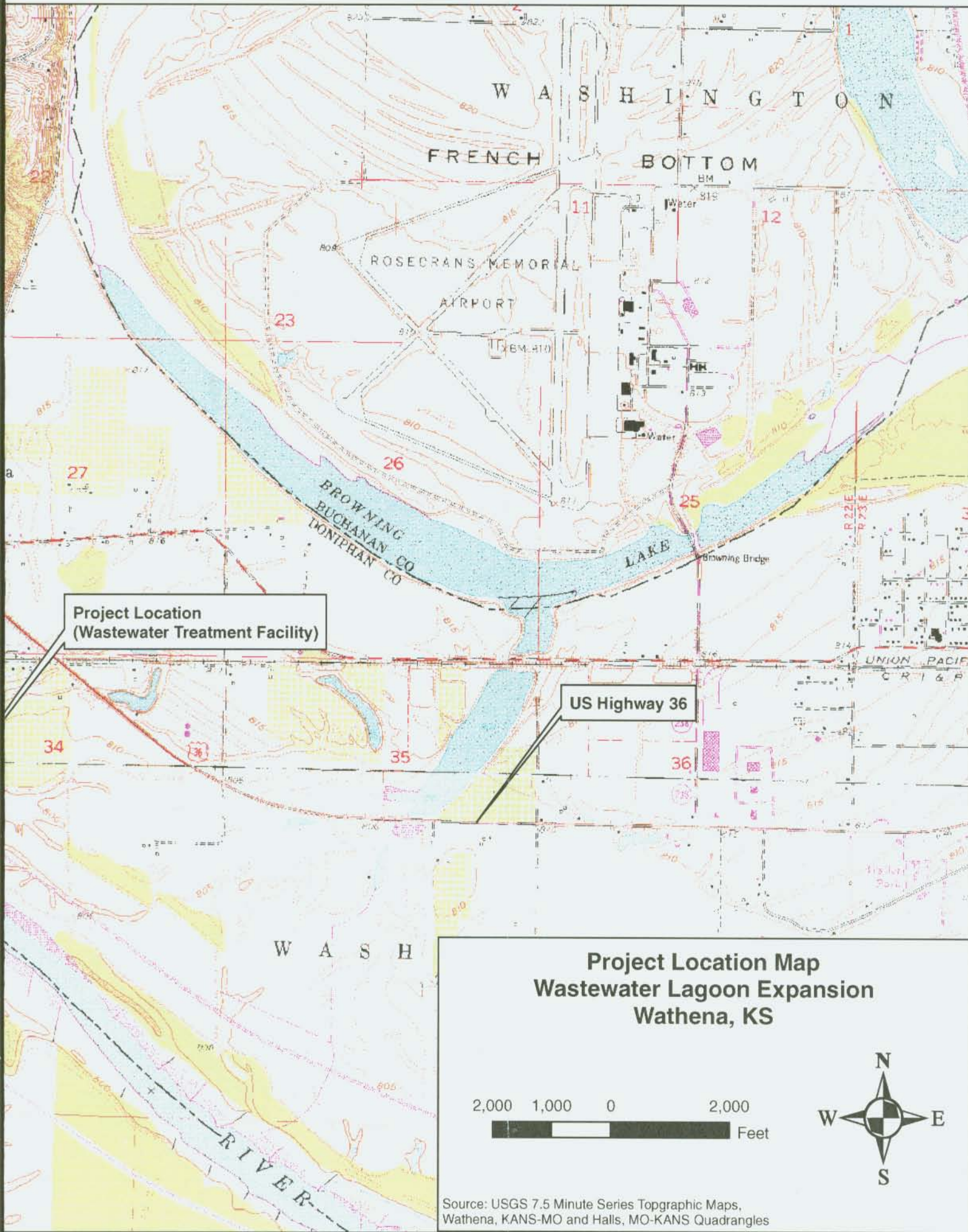


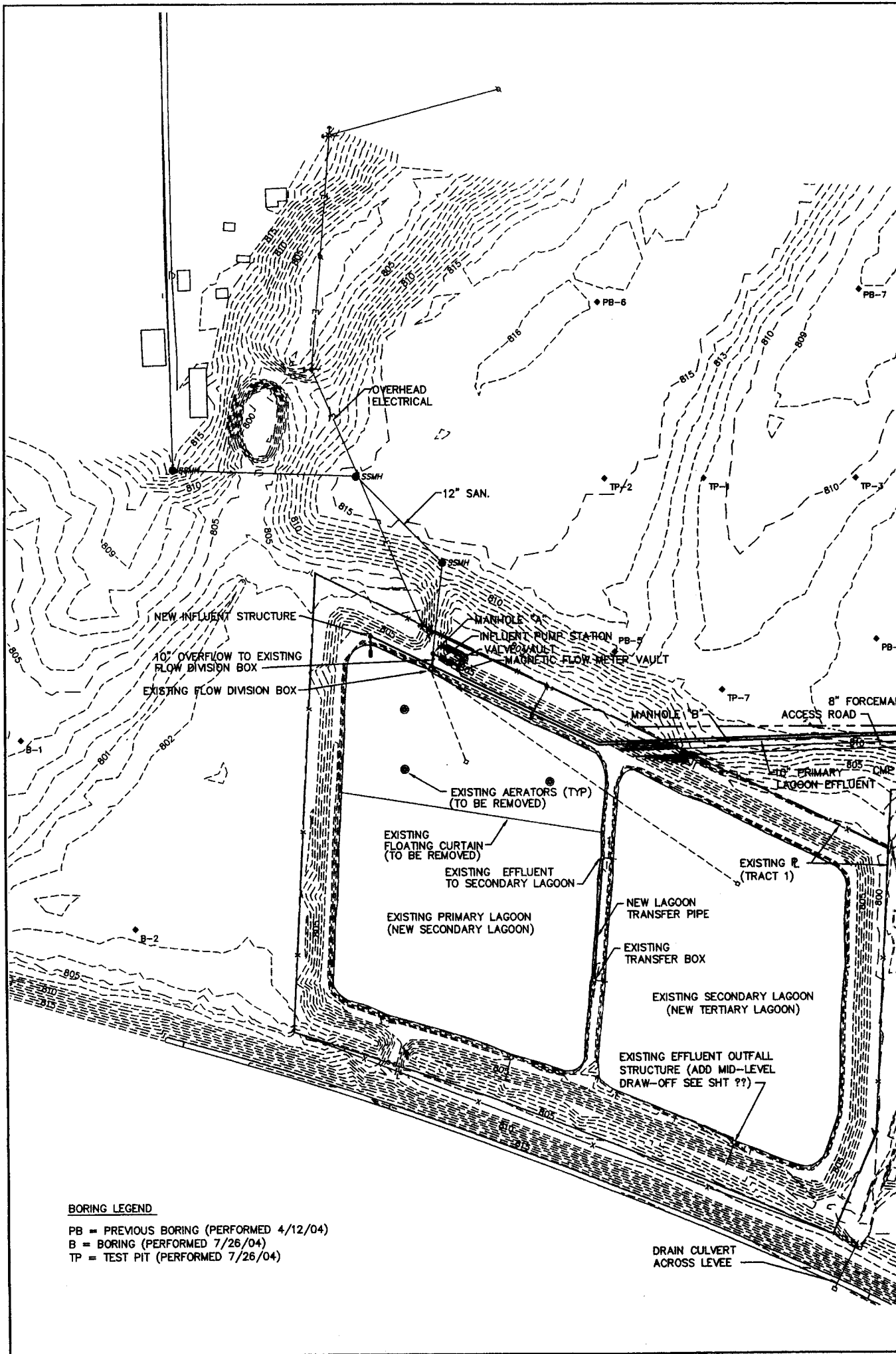
Jay Norco, P.E.
Project Manager

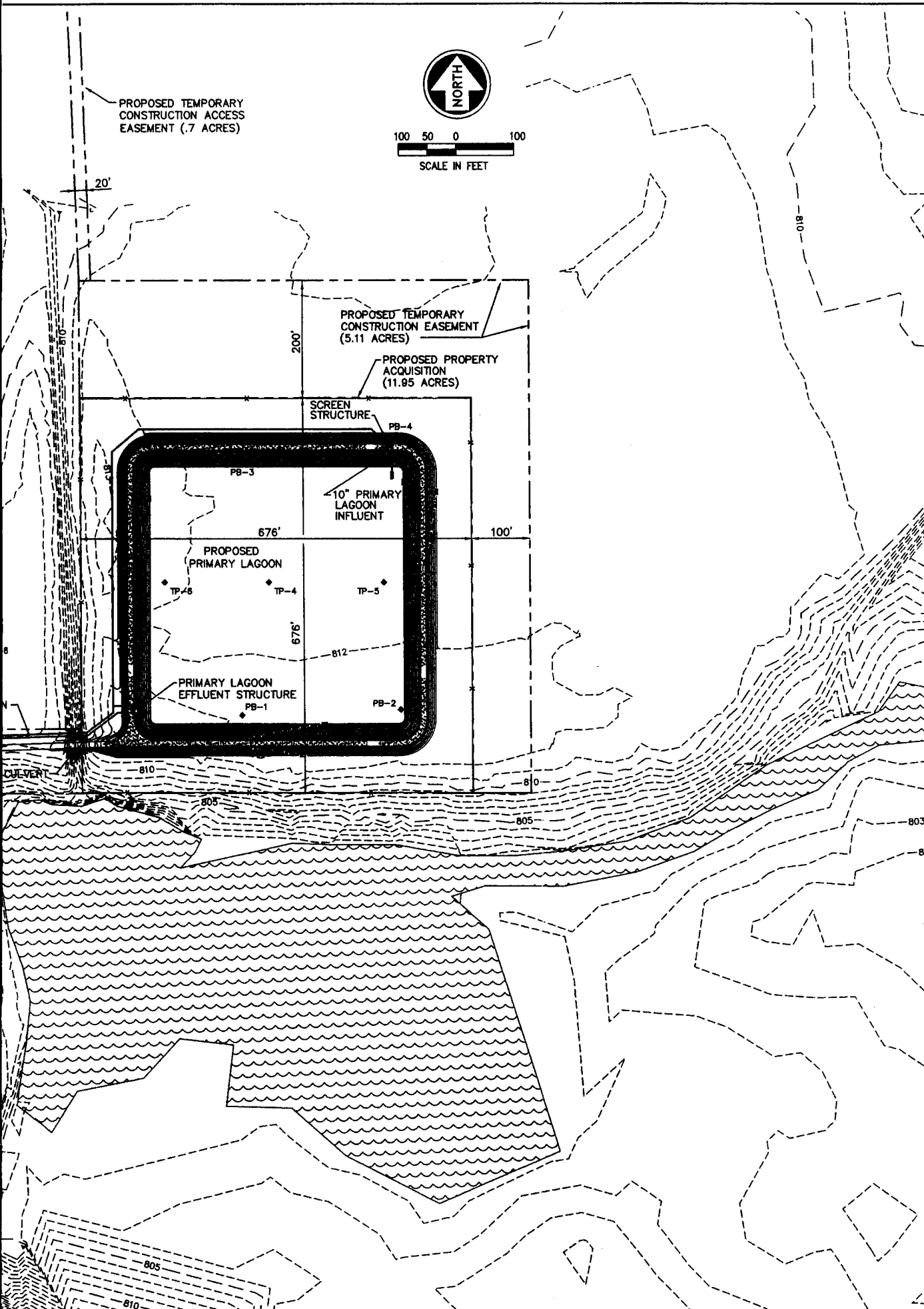
Enclosures: USGS Project Location Map
WWTF Site Plan

CC: City of Wathena
SKW File









100 50 0 100
SCALE IN FEET

SITE PLAN

SHAFER, KLINE & WARREN, INC.

2940 Main St., Kansas City, MO 64108
816/756-0444 FAX: 816/756-1763



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**CITY OF WATHENA, KANSAS
WASTEWATER LAGOON EXPANSION**

SITE PLAN

SHEET NO.
C1

5	4	3	2	1	NO. DATE	REVISIONS	BY	APPD
DESIGNED BY	JEV/TSM							
DRAWN BY	DAB							
CHECKED BY	STB							
ISSUE DATE	12/01/00							
JOB NO.	303333							

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