Pfile: Greenbrier
TN0020621

PRELIMINARY ENGINEERING REPORT

Re: Qd = 0.74 MGD

FOR THE PROPOSED

CITY OF GREENBRIER

SEWER SYSTEM REHABILITATION

GREENBRIER, TENNESSEE

January, 2003

PREPARED FOR:
Greenbrier, Tennessee

By:
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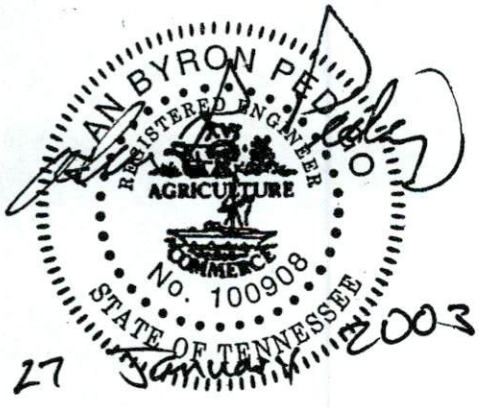

27 January 2003

I. Introduction

The City of Greenbrier, Tennessee presents this Application and Preliminary Engineering Report to obtain a grant from the Community Development Block Grant (CDBG) program. The grant will be used in conjunction with local monies to rehabilitate sanitary sewer lines and manholes that have exceeded their expected life and are now allowing excessive amounts of infiltration/inflow to be introduced into the city sewer system. This places an unnecessary burden on the collection system and wastewater treatment plant both from an operational and economic standpoint. The following report describes the need for the project and outlines the scope of the proposed corrective measures to be included in this funding request.

The City of Greenbrier is located in southern Robertson County approximately 25 miles north of Nashville, Tennessee and was incorporated in 1937. The Mayor of Greenbrier is:

The Honorable Glenn West

202 West College Street

Greenbrier, Tennessee 37073

II. Project Planning Area

The project area would best be termed as rural, with land usage classified as primarily residential and agricultural with limited commercial. The topography of the region is comprised of plateaus edged by steep inclines.

III. Existing Facilities

Sewer service in the region is provided by gravity collection extended by pumping stations. Within these sub-systems, grade is typically not a problem but some segments are at or slightly below state allowable grade with some evidence of sulfuric attack. The rainfall activity is typical for the region and averages around 53 inches annually. Soil conditions, as they relate to drainage, are typically good due to a sub-base of gravel and sand-like fines beneath a clay/silty surface. The wet weather season from October through March produces the highest ground water elevations that result in the most frequent incidences of excessive infiltration/inflow.

The collection system conveys the wastewater to the Greenbrier WWTP where it is treated and eventually discharged to an unnamed tributary of Carr Creek.

IV. Project Need

The City of Greenbrier has recently undertaken approximately $3,000,000 worth of improvements to the wastewater collection and treatment system. These improvements include expansion of its wastewater treatment plant from 0.49 MGD to 0.74 MGD and the addition of tertiary filtration and effluent flow equalization, replacement of two outdated pump stations and force mains, and the replacement of approximately 6,000 linear feet of 10-inch concrete trunk sewer with 15-inch PVC pipe. These improvements

SPW
- MB3 ✓
WDM ✓
Greenbrier Pt S

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE ENVIRONMENTAL FIELD OFFICE
537 BRICK CHURCH PARK DRIVE
NASHVILLE, TENNESSEE 37243-1550
February 19, 1997

Mr. Steven T. Pudlo
Hart-Freeland-Rogers Inc.
P.O. Box 1974
Brentwood, Tennessee 37024-1974

Re: Planning Limits
Greenbrier Wastewater Treatment Plant Expansion
Robertson County

Dear Mr. Pudlo:

This is in response to your request of October 9, 1996, for planning limits for a proposed expansion of the wastewater treatment plant (WWTP) to 0.74 mgd, or possibly 0.98 mgd.

Enclosed are the planning limits for a proposed discharge of 0.74 mgd. These limits are for an increase in the discharge flow at the present discharge location. At this time it is felt that the receiving stream must be restored to support its designated uses before a discharge greater than 0.74 mgd will be considered. As you and I have already discussed, there is evidence that the cyclic discharge rate characteristic of a sequencing batch reactor (SBR) treatment plant such as Greenbrier's has significantly greater adverse impact on a relatively-small receiving stream than that of a continuous-flow treatment plant. Therefore it is requested that any proposed improvements at the Greenbrier WWTP include provisions for controlling the discharge rate of flow and its duration (a lower rate of flow spread out over a longer duration of discharge appears to be more desirable than what is now occurring). As you and I also discussed, there may be a question as to whether true flow equalization over a relatively-long period of time (such as 24 hours) is needed, or would some type of attenuation of the peak rate of flow over a shorter period of time during each discharge cycle be adequate. As your project plans develop, your thoughts on this topic are invited for consideration. By copy of this letter, the DWPC Plans Review Section is being notified of my concern about this matter.

These limits are for planning purposes only; approval to discharge and final effluent limits will be given when a permit modification is issued. If design drawings and specifications for the WWTP expansion have not been submitted and approved within one year after the date of this letter, then these planning limits must be reviewed and be reaffirmed by the Division of Water Pollution Control.

Additional steps which are required by State law prior to discharge at the higher flowrate:

1. Submission to and approval by the Division of Water Pollution Control of design drawings and specifications for the proposed WWTP expansion prior to the start of construction. A minimum of three (3) sets of design drawings and specifications and a check for $100.00 made out to 'Tennessee Department of Environment and Conservation' should be submitted to:

Tennessee Division of Environment and Conservation
Division of Water Pollution Control/Plans Review Section
6th Floor, L & C Annex
401 Church Street
Nashville, Tennessee 37243-1534

2. The WWTP must be operated under the supervision of a certified WWTP operator. The name of the operator should be provided to the Division of Water Pollution Control/Nashville Field Office at least sixty (60) days prior to the start of operation of the expanded WWTP.

3. A final inspection of the WWTP expansion by personnel from the Division of Water Pollution Control, upon substantial completion of construction and prior to its use.

4. The NPDES discharge permit must be modified to reflect the higher discharge rate. The request for permit modification may be made at the same time that the design drawings and specifications are submitted. The request for permit modification should be addressed to the Division of Water Pollution Control, Nashville Field Office.

Your interest in this matter is appreciated. Should you have any questions, please call me at 615/650-7263.

Sincerely,

David T. Irvine
Nashville Field Office
Division of Water Pollution Control

Enclosures

CC: Sherry Wang, TDEC/DWPC/Central Office/Watershed Management Section
Sam Weiland, TDEC/DWPC/Central Office/Plans Review Section

MEMORANDUM

Date: January 18, 1997

To: David Irvine, Nashville Field Office

From: Sherry Wang, Watershed Management Section

Re: Planning Limits for Greenbrier STP, Robertson County

David, as we have discussed over the telephone, planning limits for the above referenced project is attached for your review.

Since this unnamed tributary is a 3Q20 low flow of 0 cfs stream, the allowable instream NH3-N in summer can only be 1.2 mg/l and dissolved oxygen has to be at least 5 mg/l. Our experience indicates that a SBR type of discharge usually is rather stressful to small streams specially during low flow periods. The plant's existing design capacity is 0.47 MGD. Consultant requested planning limits for 0.74 MGD and 0.98 MGD. According to NFO Jimmy Smith's assessment of October 21, 1996, this tributary downstream from the STP is not supporting designated uses. Water quality of a stream that is not supporting designated uses must be restored before any additional loading of pollutant can be allowed. We may want to encourage the permittee to look for other alternatives such as I/I reduction, spray irrigation during summer low flow periods, RSF, etc. At a minimum, they should first try to establish an equalization basin for discharging effluent continuously. Have you discussed this with our own Steve Fishel, the guru of RSF? He may have some innovative ideas or suggestions.

At this time, I would like to recommend only issue the requested 0.74 MGD to the applicant. Please let me know your comments or reactions. Thank you.

Planning Standards For a Proposed Discharge

Greenbrier STP
Mile 0.6 of an Unnamed Tributary to
Mile 10.1 of Carr Creek
Design Capacity=0.74 MGD

27-Jan-97

Effluent Characteristics	Effluent Limitations						Monitoring Requirements		
	Monthly Avg. Conc. mg/l	Monthly Avg. Amount lb/day	Weekly Avg. Conc. mg/l	Weekly Avg. Amount lb/day	Daily Max. Conc. mg/l	Daily Min. Percent Removal	Measurement Frequency	Sample Type	Sample Point
CBOD (5-Day)	10	62	15	93	20	40	3/week	composite	effluent
(May 1 - Oct. 31)	Report				Report		3/week	composite	influent
CBOD (5-Day)	15	93	20	123	25	40	3/week	composite	effluent
(Nov. 1 - Apr. 30)							3/week	composite	influent
Ammonia, N	1.2	7	1.8	11	2.4		3/week	composite	effluent
(May 1 - Oct. 31)									
Ammonia, N	2.1	13	3.2	20	4.2		3/week	composite	effluent
(Nov. 1 - Apr. 30)									
Suspended Slds.	30	185	40	247	45	40	3/week	composite	effluent
	Report				Report		3/week	composite	influent
Fecal Coliform	200/100 ml				1000/100 ml		3/week	grab	effluent
D.O.	6.0 instantaneous minimum						5/week	grab	effluent
Chlorine residual, T					0.02		5/week	grab	effluent
Settleable Slds. (ml/l)					1.0		3/week	composite	effluent
pH (units)	Instantaneous minimum and maximum - 6.5 - 8.5						5/week	grab	effluent
Flow	Report				Report		7/week	continuous	effluent

The 3-Q-20 low flow for this segment = 0 cfs .

These limits are valid for one year from the date of issuance.

Composite samples are proportional-to-flow.

The total chlorine residual effluent limit is determined by mass balance calculation utilizing the EPA acute toxicity value of 0.019 mg/l for protection of fish and aquatic life.

The limitations and conditions contained herein are for planning and design purposes only and as such should not be construed as an indication that a permit will be issued for this project. Application for an NPDES permit should be filed as soon as a selected alternative is determined and project details are formulated.

For BOD and suspended solids, the arithmetic mean of the effluent sample results collected in a 30 day period shall not exceed 15 percent of the arithmetic mean of the influent samples collected in the same 30 day period as specified above (85% removal).