Date requested: 11-4-94 Requestor: HVA Office: Central

Type model used: Streeter-Phelps USGS Quad: 123 SE NPDES #: TN0024473

Facility: Roane County STP Facility design flow (MGD/cfs): 1.0 MGD

City: Rockwood County: Roane

Basin: Upper Tennessee Stream: Tennessee River

Stream reach (miles): 652.1 Facility discharge point (mile): 562.4

GSF 12-12-94

Stream flow (3Q20): summer 2,300 cfs winter - cfs Drainage area (mi^2): 12,220

How 3Q20 was obtained: USGS #03520000 (see attached page)

Classified uses (check all applicable):

Domestic water supply: ✓ Industrial water supply: ✓ Recreation: ✓

Fish and aquatic life: ✓ Livestock watering and wildlife: ✓

Irrigation: ✓ Navigation: ✓ Trout stream: ____

Point Loads:

Name	Flow (cfs)	Mile
1.		
2.		
3.		
4.		
5.		

Withdrawals:

Name	Flow (cfs)	Mile
1.		
2.		
3.		
4.		
5.		

Significant tributaries:

Name	3Q20 (cfs)	Gage (mile)	Confluence (mile)	Drainage area (mi^2)
1.				
2.				
3.				
4.				
5.				

Station	Description	Elevation (E) (ft)	Mileage (M) (mi)	ΔE (ft)	ΔM (mi)	Slope (ft/mi)
	STP	- Embayment -				1.0

RUNS

		Proposed limits	Comments
Summer:	1.	30/-/1	OK
	2.		
	3.		
	4.		
Winter:	1.		
	2.		
	3.		
	4.		

Recommended Limits: 30/-/1

Comments:

Modeled: Carole Freeman Date: 12-12-94

Approved: _____ Date: _____

MAB/E1099212

Segments (reaches): 1 Attach graph(s)

Name	Length (mi)	Slope (ft/mi)	Discharger/withdrawal/trib (Name & flow)
1. STP	5.4	1.0	(RM 562.4 → 557.0)
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Background conditions:

Temperature: summer 25 winter 15 pH 7.5

CBOD: 1.50 N: 0.1 DO 6.0

3Q20: summer 2,300 winter ____

Data obtained (X):

Storet ____

Agreement ✓

Other ____

Previous permit limits: 30/-/1

*Automatic removal rates used? Yes SOD used? No

*If no, see next pages for EPA recommended rates (1989 Qual2EU workshop). Circle rates used.

Instream NH_3-N (mass balance calculation)

Summer 1.45 Winter 2.11

DIVISION OF WATER POLLUTION CONTROL
STREAM MODELING OUTPUT FILE VERSION 1.04

DATE: 12/28/94 CHECKED BY CSF COUNTY: ROANE

FACILITY: ROANE COUNTY STP QUAD: 123 SE
STREAM: TENNESSEE RIVER BASIN: UPPER TENNESSEE

BACKGROUND CONDITIONS

CBOD (mg/l). . . : 1.5
NH3-N (mg/l) . : 0.10
DO (mg/l). . . . : 6.00
TEMP (C) . . . . : 25.00
FLOW (cfs) . . . : 2300.00

** K1=CBOD REMOVAL K2=REAERATION
** K3=NITROGENOUS DEOXYGENATION
** K4=CBOD DECAY K5=SOD

ALLOWABLE INSTREAM NH3-N = 1.45 MG/L AT
pH 7.5 AND 25 C.

SEGMENT NO. 1 OF 1

SEGMENT NAME: STP
PERMIT NO: TN0024473

K VALUES FOR REMOVAL RATE ARE DEFAULT UNLESS
MARKED WITH ( ) WHICH INDICATES ENTERED BY MODELER

K1= 0.39 K2= 2.96 K3= 0.39 K4= 0.39 TEMP CORRECTED

K1= 0.30 K2= 2.63 K3= 0.30 K4= 0.30 UNCORRECTED

K2 (1/day) AT 20 C : 2.63
SLOPE (ft/mi) OF SEGMENT: 1.00

STREAM VELOCITY (fps) . . . . . : 2.985
TEMPERATURE USED THIS SEGMENT. . . : 25.00
DISCHARGER FLOWRATE (cfs)/(MGD) . : 1.547 / 1.0000

PROPOSED STANDARDS

CBOD (mg/l) . . : 30.0
NH3-N (mg/l). . : 15.00
DO (mg/l) . . . : 1.00

R.M.	SEG.LEN	TIME	CBOD	TOTAL AMMONIA-N	DO	TOXIC pH ABOVE	
MILES	MILES	HOURS	mg/l	mg/l	mg/l	SU	
562.400	0.000	0.000	1.519	0.110	5.997	9.02 +	<- D.O. SAG
561.900	0.500	0.246	1.513	0.110	6.053	9.02 +	
561.400	1.000	0.491	1.507	0.109	6.108	9.03 +	
560.900	1.500	0.737	1.501	0.109	6.162	9.03 +	
560.400	2.000	0.983	1.495	0.108	6.214	9.03 +	
559.900	2.500	1.228	1.489	0.108	6.264	9.03 +	
559.400	3.000	1.474	1.483	0.107	6.313	9.04 +	

558.900	3.500	1.719	1.477	0.107	6.361	9.04 +
558.400	4.000	1.965	1.471	0.107	6.407	9.04 +
557.900	4.500	2.211	1.465	0.106	6.451	9.05 +
557.400	5.000	2.456	1.459	0.106	6.495	9.05 +
557.000	5.400	2.653	1.453	0.105	6.537	9.05 +

03520000 - TENNESSEE RIVER AT LOUDON, TN

LOCATION.--Lat 35°44'33", long 84°19'56", Loudon County, on second pier from left bank at bridge on U.S. Highway 11, at Loudon, 9.75 miles downstream from Little Tennessee River, 10.75 miles downstream from Fort Loudoun Dam, 61 miles upstream from Watts Bar Dam, and at River Mile 591.6.

DRAINAGE AREA.--12,220 mi^2 (approximately).

PERIOD OF RECORD.--1923-30.

REMARKS.--Unregulated flow. Based on eight years of record; data given below may not be representative of flow.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	2,630	80	8,000	20	27,600
99.1	2,900	70	11,000	10	38,000
99	2,940	60	13,100	5	49,300
98	3,430	50	16,000	2	69,200
95	5,100	40	18,900	1	82,200
90	5,900	30	22,100	0.5	95,500

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	5,200	3,500	2,800	2,300
3	5,400	3,600	2,900	2,300
7	5,600	3,700	3,000	2,400
14	5,900	3,900	3,100	2,500
30	6,500	4,300	3,400	2,800
60	7,200	4,700	3,700	2,900
90	8,700	5,600	4,200	3,300