

Department of Natural Resources and Community Development  
Division of Water Resources

ENO RIVER CAPACITY USE INVESTIGATION

WATER MANAGEMENT OPERATIONS PLAN

August 19, 1988

Endorsed by Environmental Management Commission  
September 8, 1988

Modified March 1989

Revised July 1990

## WATER MANAGEMENT PLAN

All water users in the Eno River Basin who withdraw more than 100,000 gallons of water per day from surface water or groundwater sources are subject to the management controls of this plan. Both water withdrawals and reservoir releases are subject to controls. Water users affected by controls under the plan are listed below.

1. Town of Hillsborough -- Lake Ben Johnston withdrawal and reservoir release.
2. Orange-Alamance -- Corporation Lake withdrawal and reservoir release.
3. Piedmont Minerals -- Eno River withdrawal.
4. City of Durham -- Eno River withdrawal.
5. West Point Grist Mill -- Eno River.
6. Irrigators whose monthly average withdrawal exceeds 100,000 gallons per day.
7. Orange County -- Releases from Lake Orange, Corporation Lake, and Lake Ben Johnston.

The limited capacity of the basin requires these users to be subject to the following controls.

#### Hillsborough Water System

The Hillsborough Water System will be allowed to withdraw a maximum of 1,510,000 gallons of water per day from their intake at Lake Ben Johnston. Maximum allowable withdrawals will change as the lake levels at Lake Orange change . Table 1 indicates the maximum allowable withdrawal at successive storage levels.

#### The Orange-Alamance Water System

The Orange-Alamance Water System will be allowed to withdraw a maximum of 820,000 gallons of water per day from its intake at Corporation Lake. Allowed withdrawals will be reduced as storage at Lake Orange is reduced. Table 1 indicates the maximum allowable withdrawal for given storage levels at Lake Orange.

#### Piedmont Minerals

Piedmont Minerals will be allowed to withdraw a maximum of 900,000 gallons of water per day from their intake in the Eno River below Lake Ben Johnston when flows at the Eno Gage are 14 cfs and above. This will be reduced to 430,000 gallons per day when flows are between 14 cfs and 4 cfs. Below 4 cfs, the maximum allowable withdrawal will depend on the storage and lake levels in Lake Orange, as shown in Table 1.

### Durham Water System

The Durham Water System will be allowed to withdraw water from the Eno River below the U.S. 501 Bridge in amounts up to 5,000,000 gallons of water per day when the flows, as measured at the USGS Eno River gage at Durham, are above 30 cfs from March through May and 10 cfs during other times of the year. Withdrawals will cease when flows fall below these levels.

### West Point Grist Mill.

The West Point Grist Mill is a run-of-river operation. The Mill will be permitted to use water from the Eno for mill power and return it to the river immediately downstream.

### Irrigators With Average Use Exceeding 100,000 Gallons/Day

Irrigators will be allowed to withdraw up to their maximum monthly use, based on water use figures collected by the Division of Water Resources in 1987 for the severe drought year of 1986. Current (1986) water use would not be restricted, but increases in existing water use and large new users may be restricted. The short-range objective is to limit the expansion of irrigation acreage and facilities until downstream water supply sources can be improved.

### Users Withdrawing In Excess of 100,000 Gallons Per Day

Any users, not previously mentioned, which withdraw more than 100,000 gallons per day from either ground or surface water sources in the Eno River Basin, upstream of the confluence with the Little River, will be required to agree to limits, but are not now included in this plan.

### Instream Flow

In addition to maximum withdrawal limits set for offstream uses in the Eno River Basin, minimum instream flow requirements are established at the Hillsborough streamflow gage (USGS Streamflow Gage # 02085000). A minimum of 1.7 cfs (1,100,000 gallons per day) is to be maintained at the gage when Lake Orange is greater than 80 percent total storage. This value is reduced as the storage level decreases at Lake Orange. Table 1 lists the minimum instream flow requirements. Orange County will be responsible for coordinating releases and maintaining minimum flows at the gage. The three major withdrawers will provide withdrawal schedules to the County at least one week in advance and will notify the County immediately regarding emergencies and other necessary changes in the withdrawal schedule.

### Additional Storage

The withdrawal allocation can be revised whenever additional storage facilities are completed in the capacity use area or when additional water supplies are made available from sources outside the area. New storage facilities will be reviewed to ensure that there are no adverse effects upon the permit holders or on streamflow as measured at the Hillsborough gage.

### Outside Sources

Water obtained from sources outside of the area designated as capacity use will not be limited under the Eno Capacity Use regulations. During periods of higher flows (over 10 cfs or 6.452 MGD), public water supply systems may take additional water from the Eno, provided that they have long-term contracts for obtaining an equal amount of water from outside the basin when the flow in the Eno drops. This type of adjustment will be evaluated on a case-by-case basis by the N.C. Division of Water Resources.

### Plan Administration

Orange County will be responsible for notifying affected water users of levels at Lake Orange and of the reductions of water withdrawals as required by the Plan.

### Periodic Review and Changes

Withdrawal allowances will be subject to review every 5 years or when changes have been made to current systems, storage, or supply sources.

### Plan Support

Technical support, plan clarification, and approval of minor interim adjustments and modifications will be provided by the N.C. Division of Water Resources.

### Reporting

Average daily withdrawal in million gallons per day (MGD) for Orange-Alamance, Hillsborough, and Piedmont Minerals will be reported monthly to the Division of Water Resources. Average daily withdrawals in MGD for agricultural users will be reported annually in March.

Table 1

Maximum Allowable Surface Water Withdrawals  
Based on Lake Orange Level

Percent of Storage Remaining at Lake Orange	Drawdown in feet from top of 1-ft. flashboard	Allowable Surface Water Withdrawal -----gallons per day-----			
		Town of Hillsborough	Orange-Alamance	Piedmont Minerals	Instream Flow Requirement
> 100	spilling	*	*	**	1,100,000
100 - 80	0.0	1,510,000	820,000	430,000	1,100,000
80 - 60	2.0	1,360,000	740,000	380,000	650,000
60 - 50	4.3	1,280,000	700,000	360,000	450,000
50 - 40	5.8	1,280,000	700,000	320,000	450,000
40 - 30	7.4	1,130,000	620,000	190,000	0
<= 30	9.3	680,000	370,000	0	0

notes:

- \*- Adjusted to reflect outside source agreement for Hillsborough and Orange-Alamance.
- Excess withdrawals from Eno River based on outside source agreement may be made when flows at the Eno River at Hillsborough Gage are 10 cubic feet per second (cfs) and above, regardless of water level in Lake Orange. Maximum withdrawals will be limited to the total of the contract amount and the allocated amount.
- A low flow period will begin on the 7th consecutive day of the average daily flow at the Hillsborough Gage dropping below 10 cfs. On the 4th day, the Orange County Engineer will request that affected parties prepare for a low flow period.
- When flows are between 10 cfs and 3 cfs at the Hillsborough Gage during a low flow period, withdrawals from the Eno River shall be limited to the 100-80 percent of storage remaining amount shown above, regardless of water level in Lake Orange.
- When flows are below 3 cfs at the Hillsborough Gage, during a low flow period, withdrawals will be limited to amounts shown above for percent of storage remaining at Lake Orange.
- A low flow period will be terminated when average daily flow at the Hillsborough Gage registers 10 cfs or greater for a period of 7 consecutive days. The Orange County Engineer will notify affected parties when the low flow period is terminated.
- \*\* - For Piedmont Minerals Inc: When flows at the Hillsborough gage are 14 cfs and above, withdrawals from the Eno River will be limited to 900,000 gallons per day (gpd). Between 14 cfs and 4 cfs, withdrawals will be limited to 430,000 gpd, regardless of water level in Lake Orange. Below 4 cfs, withdrawals will be limited to amounts shown above for percent of storage remaining.

## ADDENDUM

To the Eno River Voluntary Water Use Agreement

- When Lake Orange is above 100 percent full and is spilling, Hillsborough will be allowed partial credit for water purchased from an outside source and discharged into the Eno River west of county road 1009 during the monitoring week that the discharge occurs, at a credit rate of 60 percent of the total discharge, when the discharge is made over a 24-hour period or greater. The credit volume will be divided by 7 days and added to the withdrawal limit listed in Table 1, to determine the allowed average daily withdrawal for that week. In the event that the flushing discharge straddles two monitoring weeks, the credit volume will be applied equally between the two weeks. The Orange County Engineer, or DWR staff in his absence, must be notified of the volume and the duration upon completion of the flushing. A written report of the flushing, detailing exact dates, times, and volumes, shall be included in the monthly report to DWR. If notification is not received with that month's water use report, no credit will be granted and any excess water use will be labeled as a violation of this agreement. The Division of Water retains the right to revoke permission for Hillsborough to receive credit for flushed flows if at any time, in the opinion of the Division, the ability of Ben Johnston Dam to meet downstream flows may be compromised. Said revocation will be in effect until there is notice by DWR that the problem has been corrected to its satisfaction. If Lake Orange is not spilling, no credit will be allowed.

- In the event that flow at the Eno River at Hillsborough streamflow gage is over 10 cfs, Corporation Lake and Lake Ben Johnston are both spilling water over the dams, purchases of water are being made from outside of the Eno River Basin, and the low flow period has not yet ended, users may cease their outside purchase of water and withdraw the amount of water allowed in the absence of a low flow period, as long as the ability to resume purchase of water for immediate customer delivery remains. This time period has been determined to be three days for the OWASA line. Water purchases will be made as often as necessary to flush the lines and keep them from stagnating. If flows drop below 10 cfs before the low flow period is over, Eno River withdrawals must immediately be reduced to Table 1 levels.

- Transfer of water allocation between users is permissible under the following conditions: 1) Lake Orange is greater than 80 percent full; 2) notification of the duration and specific volume of the transfer will be given by the surrendering party to the Orange County Engineer, or the DWR in his absence, a minimum of one day before the transfer is to take place; 3) the total allocation will be adjusted if necessary by the averaging period of the surrendering party, and 4) written notification of the duration and volume of the transfer will be provided by both involved parties in their monthly water use reports to DWR. If prior notification is not received, DWR will not recognize the allocation transfer.

Maximum Allowable Surface Water Withdrawals Based on Lake Orange Water Level

Percent of Storage Remaining at Lake Orange	Drawdown in feet from top of 1-ft. flashboard	Allowable Surface Water Withdrawal (gallons per day)			Instream Flow Requirement at Hillsborough Gage (gallons per day)		
		Town of Hillsborough <sup>†</sup>	Orange-Alamance	Piedmont Minerals	From Lake Orange	From West Fork Eno Reservoir	Total Flow at Hillsborough Gage
> 100	spilling	* <sup>†</sup>	*	**	1,100,000	650,000	1,750,000
Stage 1 100 - 80	0.0	1,510,000 <sup>†</sup>	820,000	430,000	1,100,000	650,000	1,750,000
Stage 2 80 - 60	2.0	1,360,000 <sup>†</sup>	740,000	380,000	650,000	650,000	1,300,000
Stage 3 60 - 50	4.3	1,280,000 <sup>†</sup>	700,000	360,000	450,000	650,000	1,100,000
Stage 4 50 - 40	5.8	1,280,000 <sup>†</sup>	700,000	320,000	450,000	650,000	1,100,000
Stage 5 40 - 30	7.4	1,130,000 <sup>†</sup>	620,000	190,000	0	650,000	650,000
Stage 6 <= 30	9.3	680,000 <sup>†</sup>	370,000	0	0	650,000	650,000

Notes:

<sup>†</sup> Allowable withdrawals for Hillsborough shown above do not include withdrawals of water supply releases from West Fork Eno Reservoir.

- \* - Adjusted to reflect outside source agreement for Hillsborough and Orange-Alamance.
- Excess withdrawals from Eno River based on outside source agreement may be made when flows at the Eno River at Hillsborough Gage are 10 cubic feet per second (cfs) and above, regardless of water level in Lake Orange. Maximum withdrawals shall be limited to the total of the contract amount and the allocated amount.
- A low flow period will begin on the 7<sup>th</sup> consecutive day of the average daily flow at the Hillsborough Gage dropping below 10 cfs. On the 4<sup>th</sup> day, the Orange County Engineer will request that affected parties prepare for a low flow period.
- When flows are between 10 cfs and 3 cfs at the Hillsborough Gage during a low flow period, withdrawals from the Eno River shall be limited to the Stage 1 amount shown above (100-80 percent of storage remaining), regardless of water level in Lake Orange.
- When flows are below 3 cfs at the Hillsborough Gage during a low flow period, withdrawals shall be limited to amounts shown above for percent of storage remaining at Lake Orange.
- A low flow period will be terminated when average daily flow at the Hillsborough Gage registers 10 cfs or greater for a period of 7 consecutive days. The Orange County Engineer will notify affected parties when the low flow period is terminated.

\*\*For Piedmont Minerals: When flows at the Hillsborough Gage are 14 cfs and above, withdrawals from the Eno River will be limited to 900,000 gallons per day (gpd). Between 14 cfs and 4 cfs, withdrawals will be limited to 430,000 gpd, regardless of water level in Lake Orange. Below 4 cfs, withdrawals will be limited to amounts shown above for percent of storage remaining.

RESOLUTION NO. 88-13  
ENVIRONMENTAL MANAGEMENT COMMISSION

WHEREAS, at the direction of the Environmental Management Commission (EMC), the Department of Natural Resources and Community Development has completed a capacity use investigation of the Eno River portion of the Neuse River Basin, pursuant to the provisions of the N.C. Water Use Act of 1967 (G.S. 143-215.11 et.seq.).

WHEREAS, the Department found that:

1. The aggregate use of surface water from the Eno River has grown to the point where coordination is required to prevent conflicts and to protect the interests and rights of riparian owners.
2. During low flow periods the demand for water exceeds the amount of water available from the Eno River.
3. Limited regulation of water users appears to be an equitable short-term alternative until new water supply sources are developed.
4. A means is needed to encourage cooperation and conservation among all water users in order that greater efficiencies in water use are promptly implemented.
5. The rapid present and projected growth of water use in the Eno Basin requires action soon to avoid the risk of even more severe water supply problems.

WHEREAS, the Department recommended that the estimated 150 square miles of the Eno River watershed area upstream from the confluence with the Little River be designated as a capacity use area.

WHEREAS, the Department developed a proposed water management plan for the Eno Basin to illustrate the types of regulations and permits that would be proposed under the capacity use designation.

WHEREAS, the water users in the Eno Basin have committed themselves to follow the proposed water management plan.

WHEREAS, the voluntary water management plan includes the essential elements of a declared capacity use area with the exception of the provisions for enforcement.

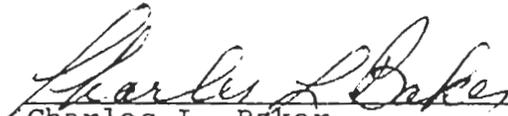
WHEREAS, the General Statute directs the Department to present "actions which might preclude the need for additional regulation,"

WHEREAS, the voluntary plan, if adhered to by those involved, satisfactorily addresses the capacity use-related problems in the Eno River area.

NOW THEREFORE, BE IT RESOLVED that the EMC accepts the Eno River Capacity Use Investigation Hearing Officer's Report and endorses the voluntary Water Management Operations Plan and directs the staff of the Division of Water Resources to monitor compliance with the plan and make periodic reports to the EMC.

BE IT FURTHER RESOLVED, that should the plan not be adhered to by those involved, that the EMC intends to proceed with a designation of capacity use for the Eno River area, as outlined in the Department's report.

This the 8th day of September 1988.

  
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Charles L. Baker  
Chairman,  
Environmental Management Commission