

Exhibit J

ASHUELOT RIVER WASTE LOAD ALLOCATION STUDY CALIBRATION/VERIFICATION



February 1989

Staff Report No. 162

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 HAZEN DRIVE - PO BOX 95
CONCORD, NEW HAMPSHIRE 03301

WASTE LOAD ALLOCATION STUDY
ASHUELOT RIVER
KEENE

NEW HAMPSHIRE WATER SUPPLY AND POLLUTION
CONTROL DIVISION

Raymond P. Carter, P.E.
Administrator, Water Quality/Permits & Compliance Bureau

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES

ALDEN H. HOWARD
COMMISSIONER

GEORGE MOLLINEAUX
ASSISTANT COMMISSIONER

WATER SUPPLY AND POLLUTION CONTROL DIVISION

JOHN COLLINS
ACTING DIRECTOR

RUSSELL A. NYLANDER, P.E.
CHIEF ENGINEER

REPORT PREPARED BY:

Robert Baczynski
Water Quality Biologist



State of New Hampshire
 DEPARTMENT OF ENVIRONMENTAL SERVICES
 WATER SUPPLY & POLLUTION CONTROL DIVISION
 Hazen Drive, P.O. Box 93, Concord, NH 03301
 603-271-3504

March 17, 1989

Mr. Alden H. Howard, Commissioner
 Department of Environmental Services
 Water Supply & Pollution Control Division
 Hazen Drive
 Concord, New Hampshire 03301

Re: Ashuelot River Study
 Keene, New Hampshire

Dear Mr. Howard:

Please find enclosed the Ashuelot River "Waste Load Allocation Study," for your review and approval. The completion of this report concludes a two year study.

Based upon the results of this study, it appears that the City of Keene will have to take remedial action to avert violating the Class B water quality standards. An executive summary has been included in the report which discusses the extent of the findings.

I wish to acknowledge not only Robert Baczynski and Richard Flanders, but the laboratory and EPA personnel who contributed greatly to the successful conclusion of this study.

Cordially,

Raymond P. Carter, P.E., Administrator
 Water Quality/Permits & Compliance Bureau

RPC/tmk
 41330

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CONCLUSIONS AND RECOMMENDATIONS

There are two areas that need to be addressed when looking at the Ashuelot River results.

1) The Ashuelot River met Class B DO standards just above the City of Keene and did not meet Class B DO standards above the Keene outfall during the August 1987 survey. Therefore, it is important to find out what sources are degrading the Ashuelot River as it flows through the City to the Keene WWTF. It is recommended that a study be conducted by the City on the Ashuelot River above the WWTF in the vicinity of Keene to isolate sources of oxygen demand and make recommendations to eliminate or reduce them.

2) Since the extent of the algal influences before the dam in West Swanzey (station 15-Ash) are not entirely known, a study to assess the impact of algae on the Ashuelot River within this reservoir needs to be conducted. A diurnal DO/water temperature/chlorophyll a study should be made during low flow, high temperature, and no precipitation conditions to see if stream standards are met on a 24 hour basis.

Based on current data with the existing wastewater discharge there were no Class B violations of dissolved oxygen below the Keene outfall. However, based upon the modeling results, it does not appear that secondary treatment at the Keene WWTF is sufficient to meet Class B stream standards projected to 7Q10 stream conditions and current permit levels.

Since, under 7Q10 and permit conditions, the Keene WWTF could not discharge secondary effluent to Reach I without violating water quality standards, the option of piping the effluent to Reach II, below the confluence of the South Branch, was modeled. The results indicate that this would result in water quality standards violations in Reach II. Therefore, this would not be a viable option as it only shifts the problem downstream.

If Keene were upgraded to advanced treatment, with the NBOD reduced to 10 mg/l and UCBOB reduced to 10 mg/l, Reach I would meet Class B stream standards. Therefore, if advanced treatment for the Keene WWTF is ultimately required, then the following permit limitations would apply:

Max Flow	9.3 cfs	Min DO	6.0 mg/l
Max UCBOB	10.0 mg/l	Max NBOD	10.0 mg/l

The scenario of pumping secondary treated wastewater from the Keene WWTF downstream of the South Branch Ashuelot River was also studied. This was not a viable option since, although Reach I would meet Class B DO standards for the entire 0.19 mile length, Reach II would fail to meet the DO standard for the entire length (4.32 miles).

Based on the findings of this study, it is recommended that the City of Keene continue current operations for a period of one year. During this time, the City will conduct the following investigations:

1) The City will investigate and remedy point sources to the Ashuelot River in and around the City in an attempt to raise dissolved oxygen levels in the river at the Keene WWTF.

2) The City will investigate the possibility of low flow augmentation to the Ashuelot River from the Surry Mountain or Otter Brook Dams. If a higher minimum flow at the Keene WWTF could be provided, there may not be a need for advanced treatment.

In addition, a Use Attainability study will be conducted in order to demonstrate that all Class B uses are being met.

Also during this period of a year, the NHDES will have proposed changes to the States Water Quality Standards (RSA 149:3). If changes are adopted following public review and comment, the NHDES will reassess Keene's situation based on the results of the investigations by the City.