



**Public Service
of New Hampshire**

Admin # 291

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The Northeast Utilities System

D21946

U.S. Environmental Protection Agency
Region 1: New England
Office of Ecosystem Protection
Surface Water Branch (CAA)
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Dear Sir/Madam:

Merrimack Station
NPDES Permit No. NH0001465
2003 Annual Fish Impingement Report

Public Service of New Hampshire (PSNH) submits this Annual Fish Impingement Report for the year 2003 pursuant to Part I, Section A.10.b of the Merrimack Station NPDES Permit, No. NH0001465. This permit condition requires PSNH to conduct impingement monitoring at Merrimack Station according to the provisions below.

- PSNH shall provide impingement monitoring at Merrimack Station when flows from Garvins Falls Hydroelectric Station are less than 900 cfs during any period from July 1 through October 15.
- PSNH shall collect all fish from both MK-1 and MK-2 traveling screen washes during one continuous 48-hour period per week when the conditions outlined above are met.
- PSNH shall report in writing to the New Hampshire Fish & Game Department (NHFGD), United States Fish and Wildlife Service (USFWS), New Hampshire Department of Environmental Services (NHDES) and the United States Environmental Protection Agency (USEPA) any Extraordinary Impingement Event (EIE) at Merrimack Station. An EIE is defined as an event when 50 or more fish at any one time, of any size or species, are either distressed or killed as a result of impingement.

Based on river flows at Garvins Falls Hydro, Merrimack Station was required to collect seven weekly samples from the intake screens between July 1 and October 15. A total of 16 fish were collected in these samples. Impingement rates for the sampling periods were calculated by dividing the total number of fish collected by the total volume of water passed through the units. The volume of water is based on circulating pump capacities and the number of pumps operating during each screen wash cycle. Each operating unit has two pumps; the pumps servicing Unit 1 are rated at 63 cfs each (126 cfs total), the pumps servicing Unit 2 are rated at 144.5 cfs each (289 cfs total).

Table 1 shows the total number of fish collected and the impingement rate for each sampling period. The average impingement rate for 2003 was 0.04 fish per million cubic feet of screen water. Similar to all previous seasons, this rate is very low by all industry standards even though the data was collected during worse case conditions, i.e., when river flows are less than 900 cfs. Table 2 identifies the impinged fish by common name as well as the respective total lengths. Table 3 provides corresponding scientific names of the fish species commonly found in this section of the Merrimack River. There were no extraordinary impingement events during the 2003 monitoring period.

Should you have any questions regarding this program, please contact me at (603) 634-2439.

Very truly yours,



Allan G. Palmer
Senior Engineer

cc: NH Department of Environmental Services
Water Division.
Wastewater Engineering Bureau
Permits and Compliance Section
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Mr. Joseph F. McKeon
US Fish and Wildlife Service
Central New England Fishery Resources Complex
151 Broad Street
Nashua, NH 03063

Mr. William C. Ingham, Jr.
New Hampshire Fish and Game Department
11 Hazen Drive
Concord, NH 03301-6500

TABLE 1

Merrimack Station
 Fish Impingement Monitoring Program
2003 Schedule & Impingement Rates

48 Hour Sample Dates	Unit(s) Sampled	48 Hour Flow Through the Units	Impingement Rate	Fish Count
7/3-7/5	1&2*	46,742,400 cu. ft.	0.09/million cu. ft.	4
7/6-7/8	1&2	71,712,000 cu. ft.	0.03/million cu. ft.	2
7/13-7/15	1&2	71,712,000 cu. ft.	0.03/million cu. ft.	2
7/20-7/22	1&2*	46,742,400 cu. ft.	0	0
7/29-7/31	1&2**	62,868,600 cu. ft.	0.00/million cu. ft.	1
9/1-9/3	1&2	71,712,000 cu. ft.	0.06/million cu. ft.	4
9/12-9/14	1&2	71,712,000 cu. ft.	0.04/million cu. ft.	3

* Unit 2 was off-line with only one pump running.

** Unit 2 went off-line during the sampling event.

The average impingement rate for the seven sampling periods was 0.04 fish per million cubic feet of screened water.

TABLE 2

Merrimack Station
 Fish Species Collected During Impingement Monitoring
July 1 - October 15, 2003

<u>Sampling Period</u>	<u>Fish Species Collected</u>	<u>Total Length</u>
7/3-7/5	Alewife	7.5 cm
	American Shad	7.0 cm
	American Shad	19.0 cm
	White Sucker	10.0 cm
7/6-7/8	Pumpkinseed Sunfish	18.0 cm
	Creek Chub	20.0 cm
7/13-7/15	Brown Bullhead	16.5 cm
	Common Shiner	13.0 cm
	Possibly a White Sucker	*
7/29-7/31	White Sucker	<u>45.0 cm</u>
9/1-9/3	Smallmouth Bass	24.0 cm
	Common Shiner	8.0 cm
	Common Shiner	5.0 cm
	Common Shiner	5.0 cm
9/12-9/14	Not Recorded**	5.0 cm
	Not Recorded**	4.0 cm
	Not Recorded**	13.0 cm

* Badly decomposed fish that was obviously dead prior to impingement so it is not included in the data base.

** Three live fish were collected and returned to the river immediately. Operators did not identify the species.

TABLE 3

Merrimack Station
Scientific Names of Species
Common in the Merrimack River

Smallmouth Bass	<i>Micropterus dolomieu</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Bluegill Sunfish	<i>Lepomis macrochirus</i>
Pumpkinseed Sunfish	<i>Lepomis gibbosus</i>
Redbreasted Sunfish	<i>Lepomis auritus</i>
Brown Bullhead	<i>Ictalurus nebulosus</i>
White Sucker	<i>Catostomus commersoni</i>
Yellow Perch	<i>Perca flavescens</i>
Common Shiner	<i>Notropis cornutus</i>
Spottail Shiner	<i>Notropis hudsonius</i>
Alewife	<i>Alosa pseudoharengus</i>
Chain Pickerel	<i>Esox niger</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Common Carp	<i>Cyprinus carpio</i>