



March 2, 1999

D13976

Mr. Fred B. Gay
U.S. Environmental Protection Agency
Region 1
J.F. Kennedy Building
Boston, MA 02203-2211

William J. Nadeau
Vice President - Fossil/Hydro Engineering
and Operations

NH0001465

Dear Mr. Gay:

Merrimack Station
1998 Annual Fish Impingement Report

This report is submitted pursuant to Part 1, Section A.10.b of Merrimack Station's NPDES Permit (No. NH0001465). This permit requires Public Service Company of New Hampshire (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 Merrimack Unit 1 and Unit 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.

Six samples were collected from the intake screens of Unit 1 and Unit 2 between July 1 and October 15, 1997 (see Table 1). A total of 384 fish were collected in these samples. Of these fish, 372 were juvenile alewives.

There were 2 extraordinary impingement events on September 3rd and 9th on Unit 2's circulating cooling water intake screens. Both events were reported verbally (within 24 hrs.) and in writing (within 5 business days) to the NHFGD, USFWS, NHDES and the USEPA.

A cooperative fishery management effort between the USFWS, NHFGD and the U.S. Forest Service to enhance river herring populations in the Merrimack River began in 1995. Approximately 8,500 adult fish (alewife and blueback herring) were stocked in the Merrimack River Watershed during the spring of 1998. The USFWS estimates that as many as 12 million juveniles could have migrated downstream in the river during the monitoring period. This large

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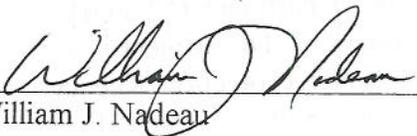
number of fish, combined with low river flows, likely contributed to the number of impingement events at Merrimack Station.

Impingement rates for the sampling periods were calculated by dividing the total number of fish collected by the total volume of water entrained through the units. The total volume of water is based on the circulating pump capacity and the pump(s) 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 (mean) average impingement rate for the 1998 monitoring program was 0.89 fish per million cubic feet of screen water (Table 2). This rate is slightly lower than the 1.0 fish per million cubic feet of screen water recorded in 1997. Impingement rates are based upon data collected during worst case conditions (river flows <900cfs); therefore we believe that, the actual impingement rate for the station is much lower than this.

Table 2 identifies the impinged fish that were collected by common name and includes the total length (TL) when possible. Table 3 provides common and scientific names of fish species commonly found in this section of the Merrimack River.

Should you have any questions regarding this report, please call Mr. Curtis R. Mooney at (603) 634-2383.

Very truly yours,
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE



William J. Nadeau

c:
NH Department of Environmental Services
Surface Water Quality Bureau
Permits and Compliance Section
6 Hazen Drive, P.O. Box 95
Concord, NH 03302 - 0095

Mr. Joseph F. McKeon
US Fish and Wildlife Service
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Laconia, NH 03246

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

TABLE 1

**Merrimack Station
Fish Impingement Monitoring Program
1998 Schedule & Impingement Rates**

48 Hour Sample Dates	Unit(s) Sampled	48 hour flow through Units	Impingement Rate	Fish Count
8/24-8/26	1&2	71,712,000 cu. ft.	0.08/million cu. ft.	6
9/1-9/3	1&2	71,712,000 cu. ft.	3.70/million cu. ft.	265
9/7-9/9	1&2	71,712,000 cu. ft.	1.16/million cu. ft.	83
9/20-9/22	1&2	71,712,000 cu. ft.	0.24/million cu. ft.	17
9/27-9/29	1&2	71,712,000 cu. ft.	0.10/million cu. ft.	7
10/5-10/7	1&2	71,712,000 cu. ft.	0.08/million cu. ft.	6

The average impingement rate for the 6 sampling periods is 0.89 fish per million cu. ft. of screened water.

TABLE 2

Merrimack Station
Fish Species Collected During Impingement Monitoring
July 1 - October 15, 1998

Impingement Sampling Period	Fish Species Collected	Total Length (TL)
8/24-8/26	Alewife	9.0 cm
	Alewife	7.0 cm
	Alewife	7.8 cm
	Alewife	8.5 cm
	Brown Bullhead	11.0 cm
	Brown Bullhead	17.0 cm
9/1-9/3	263 Alewives	6.0-9.0 cm
	*Smallmouth Bass	19.0 cm
	Redbreast Sunfish	4.5 cm
9/7-9/9	82 Alewives	7.0-10.0 cm
	Smallmouth Bass	22.0 cm
9/20-9/22	15 Alewives	6-8 cm
	American Eel	50.0 cm
9/27-9/29	Alewife	6.0 cm
	Alewife	8.0 cm
	Alewife	7.0 cm
	Brown Bullhead	10.0 cm
	Yellow Perch	8.0 cm
10/5-10/7	Alewife	10.0 cm
	Alewife	11.0 cm
	Redbreast Sunfish	12.0 cm
	Redbreast Sunfish	13.5 cm
	Redbreast Sunfish	15.5 cm
	Chain Pickerel	25.0 cm

* Smallmouth Bass decayed prior to impingement

TABLE 3

**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>
Redbreast 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>

