



Public Service
of New Hampshire

Admin # 290

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December 18, 2003

The Northeast Utilities System

John M. MacDonald
Vice President - Operations

D20376

Mr. John King
US EPA - Region I
Office of Ecosystem Protection
Surface Water Branch
NPDES Permit Unit (CPE)
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Dear Mr. King:

Merrimack Station
NPDES Permit No. NH0001465
2002 Annual Fish Impingement Report

Public Service of New Hampshire (PSNH) submits this Annual Fish Impingement Report for the year 2002 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.

Fourteen weekly samples were required in 2002 because the Garvins Falls flow was below 900 cfs for nearly the entire three month period from July 15 through October 15. A total of 12 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).

Mr. John King
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Table 1 shows the total number of fish collected and the impingement rate for each sampling period. The average impingement rate for 2002 was 0.01 fish per million cubic feet of screen water, which is on the low side of the range recorded during prior monitoring 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 2002 monitoring period.

Should you have any questions, please call Mr. Allan G. Palmer at (603) 634-2439.

Very truly yours,



John M. MacDonald
Vice President - Operations

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
2002 Schedule & Impingement Rates

48 Hour Sample Dates	Unit(s) Sampled	48 Hour Flow Through the Units	Impingement Rate	Fish Count
7/14-7/16	1&2	52,984,800 cu. ft.	0.09/million cu. ft.	5
7/21-7/23	1&2	67,550,400 cu. ft.	0.01/million cu. ft.	1
7/28-7/30	1&2	71,712,000 cu. ft.	0	0
8/4-8/6	1&2	71,712,000 cu. ft.	0	0
8/11-8/13	1&2	71,712,000 cu. ft.	0	0
8/18-8/20	1&2	71,712,000 cu. ft.	0	0
8/25-8/27	1&2	71,712,000 cu. ft.	0	0
9/1-9/3	1&2	71,712,000 cu. ft.	0.06/million cu. ft.	4
9/8-9/10	1&2	46,742,400 cu. ft.	0.02/million cu. ft.	1
9/15-9/17	1&2	60,825,600 cu. ft.	0	0
9/22-9/24	2*	49,939,200 cu. ft.	0.02/million cu. ft.	1
9/29-10/1	2	49,939,200 cu. ft.	0	0
10/6-10/8	2	49,939,200 cu. ft.	0	0
10/13-10/15	2	49,939,200 cu. ft.	0	0

* Unit 1 off-line for annual outage.

The average impingement rate for the fourteen sampling periods is 0.01 fish per million cubic feet of screened water.

TABLE 2

Merrimack Station
 Fish Species Collected During Impingement Monitoring
July 1 - October 15, 2002

<u>Sampling Period</u>	<u>Fish Species Collected</u>	<u>Total Length</u>
7/14-7/16	Alewife	8.3 cm
	Alewife	7.4 cm
	Alewife	20.5 cm
	Redbreasted Sunfish	8.1 cm
	Redbreasted Sunfish	5.2 cm
7/21-7/23	Alewife	8.2 cm
9/1-9/3	Redbreasted Sunfish	21.0 cm
	Redbreasted Sunfish	16.0 cm
	Redbreasted Sunfish	4.0 cm
	Decomposed	20.0 cm
9/8-9/10	Redbreasted Sunfish	10.0 cm
9/22-9/24	Smallmouth Bass	23.0 cm

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>



December 20, 2002

The Northeast Utilities System

John M. MacDonald
Vice President - Operations

D19257

Mr. John King
US EPA - Region I
Office of Ecosystem Protection
Surface Water Branch
NPDES Permit Unit (CPE)
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Dear Mr. King:

Merrimack Station
NPDES Permit No. NH0001465
2001 Annual Fish Impingement Report

Public Service of New Hampshire (PSNH) submits this Annual Fish Impingement Report for the year 2001 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.

Due to the relatively low river flows, fourteen samples needed to be collected from the intake screens of Unit 1 and Unit 2 between July 1 and October 15, 2001. A total of 30 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).

Mr. John King
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Table 1 shows the total number of fish collected and the impingement rate for each sampling period. The average impingement rate for 2001 was 0.03 fish per million cubic feet of screen water, which is within the range recorded during prior monitoring 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 2001 monitoring period.

Should you have any questions, please call Mr. Allan G. Palmer at (603) 634-2439.

Very truly yours,



John M. MacDonald
Vice President - Operations

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

TABLE 1

Merrimack Station
 Fish Impingement Monitoring Program
2001 Schedule & Impingement Rates

24 Hour Sample Dates	Unit(s) Sampled	48 Hour Flow Through Units	Impingement Rate	Fish Count
7/18-7/20	1&2	71,712,000 cu. ft.	0	0
7/23-7/25	1&2	46,742,400 cu. ft.	0	0
7/29-7/31	1&2	71,712,000 cu. ft.	0.03/million cu. ft.	2
8/5-8/7	1&2	71,712,000 cu. ft.	0.03/million cu. ft.	2
8/12-8/14	1&2	46,742,400 cu. ft.	0.02/million cu. ft.	1
8/19-8/21	1&2	71,712,000 cu. ft.	0.03/million cu. ft.	2
8/26-8/28	1&2	71,712,000 cu. ft.	0.01/million cu. ft.	1
9/2-9/4	1&2	71,712,000 cu. ft.	0.08/million cu. ft.	6
9/9-9/11	1&2	71,712,000 cu. ft.	0.01/million cu. ft.	1
9/16-9/18	1&2	71,712,000 cu. ft.	0.08/million cu. ft.	6
9/23-9/25	1&2	71,712,000 cu. ft.	0	0
10/4-10/6	1&2	60,825,600 cu. ft.	0.07/million cu. ft.	4
10/7-10/9	1&2	60,825,600 cu. ft.	0.02/million cu. ft.	1
10/14-10/16	1&2	71,712,000 cu. ft.	0.06/million cu. ft.	4

The average impingement rate for the fourteen sampling periods is 0.03 fish per million cubic feet of screened water.

TABLE 2

Merrimack Station

Fish Species Collected During Impingement Monitoring

July 1 - October 15, 2002

<u>Sampling Period</u>	<u>Fish Species Collected</u>	<u>Total Length</u>
7/29-7/31	Alewife	6.5 cm
	Alewife	15.5 cm
8/5-8/7	Redbreasted Sunfish	8.5 cm
	Alewife	8.5 cm
8/12-8/14	Alewife	17.5 cm
8/19-8/21	Alewife	9.0 cm
	Redbreasted Sunfish	11.5 cm
8/26-8/28	Alewife	4.5 cm
9/2-9/4	Alewife	10.5 cm
	Alewife	5.5 cm
	Alewife	13.0 cm
	Alewife	27.0 cm
	Alewife	5.5 cm
	Alewife	5.5 cm
9/9-9/11	Alewife	11.0 cm
9/16-9/18	Smallmouth Bass	8.8 cm
	Smallmouth Bass	8.8 cm
	Redbreasted Sunfish	7.6 cm
	Redbreasted Sunfish	3.8 cm
	Redbreasted Sunfish	3.8 cm
	Redbreasted Sunfish	12.7 cm

10/4-10/6	Pumpkinseed Sunfish	13.0 cm
	Pumpkinseed Sunfish	16.8 cm
	Smallmouth Bass	24.5 cm
	American Eel	10.0 cm
10/7-10/9	Redbreasted Sunfish	16.8 cm
10/14-10/16	Redbreasted Sunfish	10.2 cm
	Redbreasted Sunfish	5.1 cm
	Redbreasted Sunfish	5.1 cm
	Redbreasted Sunfish	7.6 cm

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>