**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**EPA NEW ENGLAND**
**OFFICE OF ECOSYSTEM PROTECTION**
**ONE CONGRESS STREET**
**SUITE 1100 (MAIL CODE: CPE)**
**BOSTON, MASSACHUSETTS 02114-2023**

# FACT SHEET

**DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES**

**PUBLIC NOTICE START AND END DATES:**

**PUBLIC NOTICE NUMBER:**

**CONTENTS:** Thirty pages including three Attachments A through C.

**NPDES PERMIT NO.:** NH0000752

**NAME AND MAILING ADDRESS OF APPLICANT:**

New Hampshire Fish and Game Department
11 Hazen Drive
Concord, New Hampshire 03301-6500

**NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:**

Facility Location

New Hampton State Fish Hatchery
State Highway (Route) 132 (Also, Main Street in New Hampton)
New Hampton, New Hampshire

Mailing Address

New Hampshire Fish and Game Department
New Hampton State Fish Hatchery
c/o Superintendent
200 Main Street [Also, State Highway (Route) 132]
P.O. Box 306
New Hampton, New Hampshire 03256

**RECEIVING WATER:** Tributary to the Pemigewasset River, known locally as Dickerman Brook (Hydrologic Basin Code: 01070001)
**CLASSIFICATION:** Class B

Receiving waters designated as Class B in New Hampshire pursuant to RSA 485-A:8 are considered suitable for swimming and other recreational purposes, maintenance of shellfish and other fish life, and for use as a water supply after adequate treatment**.**

**I. Proposed Action, Type of Facility and Discharge Location.**

The applicant, New Hampshire Fish and Game Department (NHF&GD), has applied to the U.S. Environmental Protection Agency, New England Office (EPA-New England) for reissuance of its NPDES permit for the discharge of culture water from its New Hampton State Fish Hatchery, a concentrated aquatic animal production (CAAP) facility. Presently, this state owned and operated facility is engaged in the hatching and rearing of various species of trout from eggs either produced on site or brought there from other New England States, New York and/or West Virginia which are then raised to various sizes: fingerlings, yearlings, 2-year old and three plus year old populations for stocking and/or broodstock (eggs) purposes. This facility also rears a portion of its various trout species from eggs to the fingerling stage for transfer to other state hatcheries for grow out as well as produces some of its own trout eggs from its three plus year old broodstock population. All fish from this facility are used for fisheries management (stocking) in selected New Hampshire water bodies.

Discharges from CAAP operations, such as New Hampton's Fish Hatchery, typically contain organic and inorganic solids, nutrients and also chemicals used in the prevention and treatment of various diseases. Any of these constituents could impair the water quality in the receiving water. Solids in the discharge occur both in the dissolved and particulate form and result from fish feces and uneaten food particles. Nutrients such as phosphorus and nitrogen are associated with these solids. In sufficient concentration, solids and nutrients have the potential to create dissolved-oxygen deficits in the receiving water due to the decay of organic solids, and the presence of nutrients allow for excessive growth of any or all of the three main algae types: phytoplankton (floating freely in water column), periphyton (attached to aquatic vegetation or other structures) and benthic (attached to bottom sediments).

The EPA-New England is proposing an NPDES permit for this CAAP production facility which is defined in 40 Code of Federal Regulations (CFR) Section 122.24(b) to mean "a hatchery, fish farm, or other facility which meets the criteria in appendix C of this part, or which the Director designates under paragraph (c) of this section." Pertinent regulations in 40 CFR (Parts 122.24, 122.25 and Appendix C of Part 122) that give EPA authority to regulate discharges from fish hatcheries through the NPDES program are shown in **Attachment A**. This facility has been designated a CAAP facility because according to its application dated August 29, 2002, New Hampton produces more than 20,000 pounds of harvestable weight of fish in a given year and used more than 5,000 pounds of food during the calendar month of maximum feeding. They reported total yearly harvestable weight for trout of 46,000 pounds and for salmon of 727 pounds with a maximum feeding rate of 7,800

pounds during October for all species. See **Attachment A**, Appendix C to Part 122, Section (a)(1) and (2).
The New Hampton State Fish Hatchery's existing ("current") permit was issued on August 28, 1974, and expired on August 1, 1979. The applicant has requested renewal of its NPDES permit to discharge effluent (untreated water used in rearing trout/salmon) into the designated receiving water and has submitted the proper application materials. Their current permit has been continued in force (administratively extended) as per 40 CFR Section 122.6 until a new permit can be issued.

The current permit authorizes a year round discharge to the waters of the United States from various outfalls and that authorization to discharge will be continued with limits, monitoring requirements and Best Management Practices as described in this Fact Sheet and shown in the accompanying Draft Permit. Location of the State's New Hampton Fish Hatchery with respect to State Highway 132 and the receiving water (Tributary to the Pemigewasset River, known locally as Dickerman Brook) along with the Pemigewasset River is shown on a copy of a U.S. Geological Survey Topographic map (See **Attachment B**). The pond just upstream of State Highway 132 is locally known as Dickerman Pond and the pond's main feeder stream and its outlet stream are also locally known as Dickerman Brook. Hereinafter, to differentiate with respect to Dickerman Pond whether a particular hatchery discharge to Dickerman Brook is either upstream or downstream of that pond, (US) for upstream and (DS) for downstream of the pond has been added to Dickerman as in Dickerman (US) Brook.

## II. Description of Facility including Chemical/Drug Usage, Discharge and Current Permit.

The New Hampton State Fish Hatchery is located in the lower reaches of a Tributary to the Pemigewasset River known locally as Dickerman Brook and consists of an upper hatchery situated on the northeast side of State Highway 132 and a lower hatchery situated on the southwest side of State Highway 132 (See **Attachment B**). It was originally constructed in 1919-1920 with an additional rearing unit constructed in the lower hatchery in 1947. In 2001, New Hampton produced around 52,000 pounds (lbs) of fish for stocking in the public waters of New Hampshire and for broodstock in the hatchery system of New Hampshire. This breaks down to: (1) for stocking purposes, around 37,000 lbs of Eastern Brook Trout, 5,000 lbs of Rainbow Trout, 4,000 lbs of Brown Trout and 700 lbs of land-locked Atlantic salmon; and (2) for broodstock purposes, around 4,600 lbs of Eastern Brook Trout and 600 lbs of Brown Trout with yearly variations for each species of around ± 10 percent (%). In the recent past, annual fish production has varied from a low of 49,154 lbs in 1997 to a high of 65,248 lbs in 1999. The rearing of land-locked Atlantic Salmon at this facility was part of an experimental program initiated by the NHF&GD, that according to state officials will likely not be continued. However, because both trout and salmon belong to the same family, *Salmonidae*, their similar metabolisms and habitat requirements allow them to coexist in the same stream, thus this draft permit allows for the growth of trout and salmon species at this facility.

New Hampton has five main rearing units in regular use and three rearing units available that are currently not in use for various reasons. Also, the hatchery operates two treatment systems to improve the quality of water prior to its delivery to the various rearing units. In the upper hatchery, **Hatchery Building** is used to rear (hatch) eggs to fingerlings, **Raceway A-5** is used to house the

hatchery's broodstock, **Raceway A-2** is used seasonally when culture water is available for the intermediate rearing of broodstock of different generations, **Raceway A-3** is available but has not been used in recent years due to water-supply constraints and structural integrity issues and **Raceway A-4** has been abandoned all together due to a combination of insufficient water supply and structural integrity problems. In the lower hatchery, there are two sets of rearing units, **Raceway B and Circular Tank B collectively referred to as Station B**, and **Raceway C and Circular Tanks C collectively referred to as Station C**, which are used to rear fingerlings to stockable (yearling and/or two year) sizes. **Raceway B and Circular Tank B all of Station B** are available for use, but due to water-supply constraints have not been used in recent years. **Raceways A-3, A-5, and Raceways B and C** are totally exposed to the elements; whereas, **Hatchery Building** and **Raceway A-2** are enclosed within wooden structures and all **Circular Tanks B and C** are covered by Quonset Huts (PVC/metal frame) for protection against predators (birds) and cold winter temperatures.

At this hatchery, the main forms of treatment of the influent are aeration/degassing columns in the upper hatchery (Hatchery Building) coupled with the addition of liquid oxygen to obtain the proper mix and level of dissolved gases (mainly to reduce the total gas pressure (TGP) in the spring [ground] water) along with the addition of calcium chloride to increase alkalinity and calcium levels in the spring water delivered to the Hatchery Building. In addition, liquid oxygen is also added to the culture waters in the lower hatchery complex on an as need basis.

Water for fish culture at New Hampton's hatchery is obtained from basically two sources: ground water from several free flowing springs and surface waters diverted from Dickerman (US) Brook, Dickerman Pond and from Dickerman (DS) Brook (**See Attachment C**). The upper hatchery is fed from springs with a potential for minor flow augmentation from Dickerman (US) Brook; whereas, the lower hatchery is feed mainly from Dickerman Pond and to a lesser extent from Dickerman (DS) Brook plus from a spring. These on-site supplies assure a good quality water at the proper temperature for the growth of salmonides (mainly trout). Because the hatchery has no continuous flow measuring devices, flow rates from the various fish rearing units (raceways and circular tanks) have to be estimated.

Trout are grown from hatched eggs to fingerling (3 inches) size in what is called the Hatchery Building and from fingerling to yearling size (10 to 11 inches) or slightly greater (2 and 3 plus year olds) in a series of raceways and circular tanks for stocking and broodstock purposes. As mentioned earlier, solids in the culture water are generated from only two sources: fish feces and uneaten food particles. Water flows, on a continuous basis, through each of the various rearing units containing fish and entrains a portion of the fish feces and uneaten food in it; however, the bulk of these solids settle to the bottom of each rearing unit for later removal at regular intervals. For permit purposes, there are two types of water flow that discharge pollutants to the receiving water. They are "Overflow Water" which flows continuously through the rearing units and contains minor amounts of solids; whereas, "Cleaning Water" is a portion of the overflow water that has been periodically diverted on a regular basis and it contains settled solids brushed from the bottom of the rearing units. Due to the piping network at New Hampton, all of the solids contained in either the "Overflow Water" or the "Cleaning Water" flow are presently discharged without treatment to waters of the

United States.

The estimated maximum flow rates of "*overflow*" aka "*flow through*" water discharged by the various rearing units at full utilization are described below and summarized in Table One following. This discussion focuses primarily on the rate of *flow through* water discharged by individual rearing units to the receiving water and only incidently, on the rate of *flow through* water discharged to other rearing units as part of a serial reuse program. For example, Hatchery Building *overflow* water is not discharged directly to the receiving water for its discharge is serial reused as part of the *flow through* water to Raceway A-5 which then discharges about 450 gpm into Dickerman (US) Brook. Should Raceway A-5 be inoperative, the Hatchery Building's *overflow* water would still be discharged through Raceway A-5's outfall. The source water for the Hatchery Building is spring water and the source waters for Raceway A-5 are serial reuse water from the Hatchery Building augmented by water from springs and potentially from Dickerman (US) Brook. Raceway A-2 discharges about 150 gpm into Dickerman (US) Brook unless Raceway A-3 is on-line in which case Raceway's A-2 discharge is diverted into Raceway A-3 for serial reuse prior to its discharge into Dickerman (US) Brook at a overflow rate of about 380 gpm. The source water for Raceway A-2 is spring water and the source waters for Raceway A-3 are serial reuse water from Raceway A-2 augmented by serial reuse water from the Hatchery Building and from Dickerman (US) Brook. Like the Hatchery Building, Raceway B's *overflow water*, when in use, is not discharged directly to the receiving water for its discharge is serial reused as part of the *flow through* water to Raceway C which then discharges about 600 gpm into Dickerman (DS) Brook. The source water for Raceway B is Dickerman Pond and the source water for Raceway C is Raceway B's *overflow water* plus water from Dickerman Pond augmented by water from Dickerman (DS) Brook and a small spring. Since Raceway B is inoperative, then the source water for Raceway C is Dickerman Pond augmented by water from Dickerman (DS) Brook plus a small spring. Each of the 16 circular tanks (1 of Circular B and 15 of Circular C) discharge 30 gpm into Dickerman (DS) Brook for a total discharge of 480 gpm. The source water for the only Circular B Tank is Dickerman Pond; however, the source waters for the 15 Circular C Tanks are the same as for Raceway C. In summary, at the upper hatchery, there three outfalls with the potential to discharge *overflow water* to the receiving water on a continuous basis, and at the lower hatchery, there are 16 outfalls with the potential to discharge *overflow water* to the receiving water on a continuous basis.

Table 1. –*Estimated Maximum Flow Rate by Rearing Unit Operated at Full Utilization for Those Units Discharging Directly to Dickerman Brook*

| Raceway A-2 | Raceway A-3 | Raceway A-5 | Circular B (1 tank) | Raceway C | Circular C (Sum of 15 tanks) |
|---|---|---|---|---|---|
| 150 gpm 0.22 MGD (Used seasonally) | 380 gpm 0.55 MGD (Presently, not in use) | 450 gpm 0.65 MGD | 30 gpm 0.043 MGD (Presently, not in use) | 600 gpm 0.86 MGD | 450 gpm 0.65 MGD |

The water level in each of these linear raceways is controlled by flash boards at the downstream end. Just upstream of the flash boards are the fish retaining racks (screens) to keep fish within the individual raceway units/segments. Between the flash boards and the fish racks is a quiescent zone into which solids (fish feces and uneaten food particles) settle from the overflow water just before it discharges from the raceway. These settled solids are later removed at a regular frequency with a portion of the *flow through* water via the cleaning drain located in the base of this zone, hence the name "Cleaning Water". Since these raceways, due to their design, may not be completely self cleaning (i.e. solids settle out in the raceways upstream of the quiescent zone) manual sweeping of the raceway may be necessary during the quiescent zone cleaning (flushing and brushing). This bottom cleaning is performed by staff standing either in the rearing unit or just outside it hand brushing settled solid towards the bottom drain(s) located at the end of the linear raceways or in the center of the circular tanks. Normally, fish remain in their rearing units during these bottom cleaning operations. Because each major raceway rearing unit may contain two or more linear sub raceways, the drain(s) in each quiescent zone are opened one at a time for about five minutes. Circular tanks are cleaned by opening the outlet box, a rudimentary sediment trap, and flushing it for about one minute. Again, since the circular tanks may not be completely self-cleaning, staff may have to stand near the tank's center hand brushing settled solids towards each tanks bottom drain during the normal cleaning cycles. In summary, Table Two following contains a summary of the pertinent information relative to the cleaning practices/procedures employed at each rearing unit. In addition, Table Three following contains a list of outfalls including type of water discharged to the various receiving waters for each major rearing unit including individual subunits where appropriate.

Table 2. *–Information on Cleaning Water (CW) Discharges from Rearing Units to Receiving Waters*
*Including one Pipeline Segment in the Lower Hatchery.*

[The number of cleaning outfalls per major rearing unit is one for a total of 21 cleaning outfalls. For those rearing units shown as not in use, the data presented represents the likely mode of operation if they were ever placed back into operation.]

| **Major Culture Unit** | **Number of Subunits within Major Culture Unit** | **Typical Cleaning Frequency per Subunit** | **Estimated Time of CW Discharge per Subunit (Minutes)** | **Estimated Volume of CW Discharge per Subunit (Gallons)** | **Estimated Total CW Discharge per Major Culture Unit (Gallons)** |
|---|---|---|---|---|---|
| Hatchery Building | 28 | Daily | 3 | 200 | 5,600 |
| Raceway A-2 | 16 (However, only 4 in use) | Weekly | 2 | 515 | 2,060 |
| Raceway A-3 | 10 (Generally not in use, but when in use only 2 used) | Weekly | 5 | 845 | 1,690 |
| Raceway A-5 | 10 | Weekly | 5 | 600 | 6,000 |
| Raceway B | 12 (Generally not in use) | Weekly | 5 | 900 | 10,800 |
| Circular B | 1 (Generally not in use) | Weekly | 1 | 700 | 700 |
| Raceway C | 30 (However, only 20 in use) | Weekly | 5 | 900 | 18,000 |
| Circular C | 15 | Weekly | 1 | 700 | 10,500 |
| Pipeline supplying C-Stations in Lower Hatchery | ---- | Monthly | 10 (For Pipeline) | 5,000 (For Pipeline) | 5,000 (For Pipeline) |

Table 3. --*List of Discharges (Outfalls) to Receiving Waters as Presently Exists (Pre-Draft Permit).*

[Refer to Attachment C for locations of outfall, culture unit and receiving water.]

| Outfall Number | Receiving Water | Discharging Unit | Type of Discharge Water |
|---|---|---|---|
| 001 | Dickerman (US) Bk. | Pipeline(s) to Hatchery Building | Spring waters in pipeline(s) |
| 002 | Dickerman (US) Bk. | Hatchery Building | Cleaning water |
| 003 | Dickerman (US) Bk. | Distribution Box at Hatchery Building | Overflow water in distribution box |
| 005 | Dickerman (US) Bk. | Raceway A-2 | Overflow and cleaning waters |
| 006 | Dickerman (US) Bk. | Raceway A-3 | Overflow and cleaning waters when raceway in use; otherwise rainwater and snowmelt |
| 008 | Dickerman (US) Bk. | Raceway A-5 | Overflow and cleaning waters |
| 009 | Dickerman (DS) Bk. | Raceway B | Cleaning water when raceway in use; otherwise rainwater and snowmelt |
| 010 | Dickerman (DS) Bk. | Circular B | Overflow and cleaning waters when tank in use; otherwise rainwater and snowmelt. |
| 011 | Dickerman (DS) Bk. | Header Box at Raceway C and Pipeline(s) to Raceway C | Water from Dickerman Pond, and when Raceway B in use, also overflow water |
| 013 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 014 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 015 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 016 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 017 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 018 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 019 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 020 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 021 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 022 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 023 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 024 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 025 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 026 | Dickerman (DS) Bk. | Circular C | Overflow and cleaning waters |
| 027 | Dickerman (DS) Bk. | Raceway C | Overflow and cleaning waters |
| 028 | Dickerman (DS) Bk. | Pipeline from Dickerman Pond supplying various rearing units | Water from Dickerman Pond used to periodically flush pipeline of debris |

Chemicals, Drugs and Disinfectants Currently Used in the State's Fish Hatchery System

Normally, fish hatched from eggs at New Hampton's Hatchery take between 15 to 18 months to grow out to the proper size of length/weight for stocking. According to Hatchery officials, the key to maintaining good fish health is to prevent pathogens from entering the hatchery and to maintain clean, healthy rearing units. However, when needed, U.S. Food and Drug Administration (FDA)-approved chemicals/drugs are used as therapeutants to maintain fish health. Below is a list of all the chemicals/drugs currently used in the New Hampshire State Fish Hatchery system along with their intended use, followed by a subset of that list for those recently used at the New Hampton Hatchery. A review of the first eight chemicals/drugs in New Hampshire's overall list indicate they are all FDA approved therapeutants and/or low regulatory priority aquaculture drugs. For the last three chemicals (hypochlorite solutions, oxygen gas and a solution of iodine and phosphoric acid), EPA-New England will not regulate these chemicals as long as any applied hypochlorite solution is neutralized with sodium thiosulfate prior to it being exposed to culture water, and the practice of not discharging any of the iodine and phosphoric acid solution to the hatchery's culture water is continued. Adding oxygen gas to the culture water to increase its dissolved-oxygen concentration is always appropriate and can only lead to increased dissolved-oxygen concentrations in the discharged effluent, always a positive environmental outcome.

- **Calcium Chloride (Crystalline Form):** Added to culture water to increase total hardness of the water.

- **Formalin - 37 % Formaldehyde Gas in Water with 16 % Methanol:** Added as needed to culture water to control external parasites on fish and eggs. Used primarily to kill swimming zoospores and filamentous hyphae of common mold (fungus) that attach to eggs, gills and/or skin as well as other active parasitic infections. The FDA restricts the use of formalin solution to three products with the following trade names: Formalin-F, Paracide-F and Parasite-S. Formalin is used sparingly at all the State's Fish Hatchery's, except Powder Mill, where it is used regularly to control the *ich* parasite. Regular use of Formalin at Powder Mill is not considered prophylactic by the NHF&GD; however, the Agency will address whether that use is prophylactic upon the issuance of the Powder Mill permit.

- **Oxytetracycline Hydrochloride --Also called Terramycin (Crystalline Form):** Used as an antibiotic and added as needed to culture water to control pathogenic gill bacteria on fish.

- **Polyvinylpyrrolidone (Iodine in 10 % aqueous solution) --Also called Povidone Iodine:** Used as needed to disinfect fish eggs and hatchery equipment. Solution is *not* discharged to the culture water.

- **Potassium Permanganate (Crystalline Form):** Added as needed to the culture water to provide temporary increase in the concentration of dissolved oxygen.

- **Romet 30 (Contains 25 % Sulfadimethoxine and 5 % Oremetoprim):** Used as an antibiotic and, on an as need basis, mixed with fish food to control systemic bacterial pathogens.

- **Sodium Chloride (Crystalline Form):** Added as needed to culture water to reduce osmotic pressure gradient between fish and water for the absorption of dissolved oxygen by the gills.

- **Tricaine Methanesulfonate –Also called MS-222 (Crystalline Form):** Used as a fish anesthesia, but only in separate containers of culture water and is not added to any of the rearing units. Used as needed and solution is *not* discharged in the culture water.

- **Calcium Hypochlorite (Crystalline Form)**:
- **Sodium Hypochlorite at 5.25 % (Ordinary Household Bleach in Liquid Form):** Both hypochlorite chemicals are used to disinfect hatchery equipment and the individual rearing units, as needed. Hypochlorite solutions used to disinfect hatchery equipment (nets, boots, brushes, foot bathes, rakes, transport tanks, etc.) *are* not discharged to the hatchery water and any hypochlorite solution remaining on that equipment is neutralized with sodium thiosulfate prior to its re-introduction into the culture water. If New Hampton needed to disinfect any rearing units, the fish and culture water would first be removed followed by brushing down all surfaces in contact with the culture water with a hypochlorite solution. In turn, that would be followed by a brushing down with sodium thiosulfate to neutralize the chlorite ion followed by an on the spot test using phenolphthalein indicator solution to determine if neutralization has been completed. It is standard practice to use sodium thiosulfate to neutralize chlorine (i.e., a dechlorination agent) in NPDES permits.

- **Oxygen Gas:** Added to culture water to enhance fish respiration for life support as needed.

- **Solution of Iodine and Phosphoric Acid:** Used to disinfect hatchery equipment only at the New Hampton hatchery. Used as needed and solution is *not* discharged to the culture water.

Review of the material safety data sheets for the above listed materials indicate that only **Formalin - 37 % Formaldehyde Gas in Water with 16 % Methanol** requires an effluent limitation because it is the only one with a reasonable potential to cause an exceedance of the New Hampshire's Surface Water Quality Regulations. See section entitled "Formalin" later in this Fact Sheet.

Chemicals, Drugs and Disinfectants Routinely Used at the New Hampton Hatchery

- **Formalin - 37 % Formaldehyde Gas in Water with 16 % Methanol**
- **Oxytetracycline Hydrochloride --Also called Terramycin (Crystalline Form)**
- **Oxygen Gas**
- **Polyvinylpyrrolidone (Iodine in 10 % aqueous solution) --Also called Povidone Iodine**
- **Potassium Permanganate (Crystalline Form)**
- **Calcium Chloride (Crystalline Form)**
- **Sodium Chloride (Crystalline Form)**

- **Calcium Hypochlorite (Crystalline Form)**
- **Sodium Hypochlorite at 5.25 % (Ordinary Household Bleach in Liquid Form**)
- **Solution of Iodine and Phosphoric Acid**

A quantitative description of significant effluent parameters from the current permit's effluent-monitoring data collected for this facility during the 24-month period January 2001 through December 2002 show that: Settleable Solids (SS) ranged from <0.01 to 0.80 milliliters per liter; average monthly flow ranged from 1.10 to 2.49 Million Gallons per Day (MGD); and resident fish biomass population ranged from a low of 4,530 pounds (lbs) in June (2002) to a high of 48,002 lbs in April (2001) just before the State's annual stockings. Compliance monitoring for SS limit in the current permit is based on a net calculation of effluent minus influent samples collected from the receiving water and not on effluent samples collected from individual outfalls. Specifically, samples collected from Dickerman(US) Brook just above the Hatchery Building (Referred to as Sampling Point A) are subtracted from samples collected from Dickerman (DS) Brook at a point just downstream of the last effluent pipe from Raceway C (Referred to as Sampling Point B). However, it appears from review of an inspection report done by the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) for a visit on September 12, 1995, that the hatchery only reports those values collected at Sampling Point B, thus yielding a worst-case result.

Several effluent parameters in the current permit were deleted by EPA-New England (then Region I) in a letter dated August 28, 1975, in response to a request by the Nashua National Fish Hatchery for a permit modification to their permit issued on August 28, 1974. That letter deleted Ammonia, pH, and Total Suspended Solids (TSS) from all State and Federal Fish Hatchery permits in New Hampshire leaving only the SS parameter. However, a recent review of New Hampton's monthly discharge monitoring reports shows that in addition to reporting the required "SS", the hatchery also routinely reports "Flow" and "Fish Biomass" data that resulted from an earlier compliance inspection by NHDES-WD personnel.

In recent permit issuances in New Hampshire, EPA-New England has switched to TSS from using SS because the analytical test results for TSS as compared to SS provides a more comprehensive measure of the total suspended solids content actually present in the discharge. Therefore, the Agency has chosen to limit TSS in the draft permit, in lieu of SS. The Agency considers that replacement neither an antibacksliding nor an antidegradation issue.

## III. Limitations and Conditions.

Effluent limitations, monitoring requirements, and any implementation schedule (if required) are found in PART I of the draft NPDES permit. The basis for each limit and condition is discussed in Section IV of this Fact Sheet.

## IV. Permit Basis and Explanation of Effluent Limitations Derivation.

A. Basic Regulatory Framework --Applicable Federal and State Regulations

The Clean Water Act (ACT) prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the ACT. The NPDES permit is the mechanism used to implement technology and water-quality based effluent limitations and other requirements including monitoring and reporting. The draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the ACT and any applicable State administrative rules. The regulations governing EPA's NPDES permit program are generally found in 40 CFR Parts 122, 124, 125 and 136. Many of these regulations consist primarily of management requirements common to all permits.

EPA is required to consider technology and water-quality based criteria in addition to the current permit conditions when developing permit limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the ACT (See 40 CFR Part 125, Subpart A).

In the absence of published technology-based effluent guidelines, the permit engineer is authorized under Section 402(a)(1)(B) of the ACT to establish effluent limitations on a case-by-case basis using Best Professional Judgement (BPJ).

Water-quality based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards. See Section 301(b) (1)(C) of the ACT. A water-quality standard consists of three elements: (1) beneficial designated use or uses for a water body or a segment of a water body; (2) a numeric or narrative water-quality criteria sufficient to protect the assigned designated use(s); and (3) an antidegradation requirement to ensure that once a use is attained it will not be eroded. Receiving water requirements are established according to numerical and narrative standards in the state's water quality standards adopted under state law for each stream classification. When using chemical-specific numeric criteria to develop permit limits both the aquatic-life acute and chronic criteria, expressed in terms of maximum allowable in-stream pollutant concentration, are used. Aquatic-life acute criteria are considered applicable to daily time periods (maximum daily limit) and aquatic-life chronic criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are allowed under 40 CFR Section 122.44 (d)(1) and are implemented under 40 CFR Sections 122.45(d) and (f). Therefore, the Region establishes maximum daily and average monthly limits for chemical specific toxic pollutants based, in part, on a reasonable measure of the facility's actual or projected flow rates on a average monthly and a maximum daily basis for all production-based facilities that have a continuous discharge. However, for hatcheries, the average daily discharge needed for full utilization of a given rearing unit is used for both maximum daily and average monthly limits for the flow is basically constant from day to day and week to week. Also, the dilution provided by the receiving water is factored into this process. Furthermore, narrative criteria from the state's water-quality standards are often used to

limit toxicity in discharges where: (1) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard, such as for formalin; or (2) toxicity cannot be traced to a specific pollutant.

The NPDES permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water-quality criterion. See CFR Section 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion. In determining reasonable potential, EPA considers: (1) existing and planned controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit's reissuance application, Monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in **Technical Support Document for Water Quality-based Toxics Control**, **March 1991**, **EPA/505/2-90-001** in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water. In accordance with New Hampshire statutes and administrative rules (50 RSA 485-A:8, Env-Ws 1705.02), available dilution for discharges to freshwater receiving waters is based on a known or estimated value of the annual seven consecutive-day mean low flow at the 10-year recurrence interval (7Q10) for aquatic life or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water at the point just upstream of the discharge. Furthermore, 10 % of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01. The current set of these Regulations, newly revised, were adopted on December 3, 1999, and became effective on December 10, 1999. Hereinafter, these New Hampshire's Surface Water Quality Regulations are referred to as the NH Standards.

The permit may not be renewed, reissued or modified with less stringent limitations or conditions than those conditions in the previous permit unless in compliance with the antibacksliding requirement of the ACT [See Sections 402(o) and 303(d)(4) of the ACT and 40 CFR §122.44(l)(1 and 2)]. EPA's antibacksliding provisions found in 40 CFR §122.44(l) prohibit the relaxation of permit limits, standards, and conditions unless certain conditions are met. Therefore, unless those conditions are met the limits in the reissued permit must be at least as stringent as those in the previous permit.

The ACT requires that EPA obtain State Certification which states that all water-quality standards will be satisfied. The permit must conform to the conditions established pursuant to a State Certification under Section 401 of the ACT (40 CFR §124.53 and §124.55). EPA regulations pertaining to permit limits based upon water-quality standards and state requirements are contained in 40 CFR §122.44(d).

The conditions of the permit reflect the goal of the ACT and EPA to achieve and then to maintain compliance with the State's water quality standards. To protect the existing quality of the State's receiving waters, the NHDES-WD adopted Antidegradation requirements (Env-Ws 1708) in their NH Standards.

B. Effluent Limitations and Monitoring Parameters for New Hampton Hatchery

Available Dilution

Available dilution of the receiving water is determined using the hatchery's long-term average daily discharge along with the annual 7Q10 low flow of the receiving water just above the hatchery's outfall. The available dilution is reduced by 10 % to account for the State's reserve capacity rule. The State's requirement to reserve 10 % of the Assimilative Capacity of the receiving water for future needs is pursuant to New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01 and was first included with the State's Surface Water Quality Regulations beginning with the April 1990 revisions. Inclusion of the State's reserve capacity rule is new to this draft permit for it was not included in the current permit.

Frequently, a gaged value of the annual 7Q10 low flow at the outfall is not available; therefore, other methods are utilized, such as determining an estimated annual 7Q10 low flow from a gaged location elsewhere on the receiving water or on a nearby river thought to have similar hydrologic characteristics as the receiving water, or regression equations such as the "Dingman Equation" that uses drainage area, mean basin elevation and percent of stratified drift to total drainage area.

However, in this situation, the hatchery is located in a small drainage basin where essentially all its low flows are being diverted either by the hatchery for serial reuse in fish culturing activities or by the town for water supply, thereby complicating the determination of available dilution. Just upstream of the hatchery complex, Mountain Pond Reservoir diverts Dickerman Brook as part of New Hampton's public drinking water supply. At the hatchery, brook water is used in the various rearing units through a combination of diverting spring water before it drains into Dickerman Brook or by diverting water directly from Dickerman Brook and/or Dickerman Pond. For example, culture water for Raceway A-5 is largely diverted spring water which is discharged to Dickerman Brook just upstream of Dickerman Pond and the culture water for Raceway C and Circular Tanks C is water diverted directly from Dickerman Pond that was previously discharged from Raceway A-5. Therefore, the Agency has concluded that the 7Q10 flow in Dickerman Brook both upstream and downstream of Dickerman Pond is essentially zero for the purposes of providing dilution for any type of wastewater discharge.

Disposal of Cleaning Waters

The existing practice of direct discharging of untreated cleaning waters (i.e. water and settled solids from the bottom of rearing units) to Dickerman Brook is prohibited in this draft permit because ACT regulations do not allow for the discharge of settled solids (residuals) from any type of containment vessel, such as rearing units, without some form of treatment. While State Fish and Game officials have not yet decided on the precise method they will employ to remove settled solids from the bottom of individual rearing units, they are contemplating using some type of a vacuum filtration system.

Settled solids removed from rearing units are managed as manure by the New Hampshire Department of Agriculture. This regulatory determination was made by New Hampshire Department of Environmental Services, Water Division's (NHDES-WD) in a letter dated August 6, 2003, after samplings indicated that the residuals are non-hazardous and contain no domestic sewage components. In addition, settled solids removed from fish hatcheries are not regulated by EPA-New England as sludge. Settled solids removed from the rearing units will likely be land applied at the New Hampton hatchery, or on local farm land.

Conventional Pollutants

Biological Oxygen Demand ($BOD_5$) and Total Suspended Solids (TSS) in Overflow Water

The Agency has not promulgated any Effluent Limitations Guidelines (ELG) for wastewater discharges from concentrated aquatic animal production (CAAP) facilities such as New Hampton's fish hatchery. However, the Agency did propose in the Federal Register (FR) on September 12, 2002 (67 FR 57872-57928) technology-based effluent limitation guidelines and standards for wastewater discharges associated with the operation of new and existing CAAP facilities that, if promulgated, would have provided guidance in the development of this permit. As of this writing, that ELG has not been promulgated.

Review of the proposed ELG for CAAP facilities that produce between 100,000 to 450,000 lbs per year and have discharges from "Flow-Through Systems" in which all of the flow is treated using solids settling techniques prior to discharge show proposed TSS limits of 6 milligrams per liter (mg/l) for average monthly and 11 mg/l for maximum daily and no limits or monitoring requirements were placed on $BOD_5$. The $BOD_5$ was not limited because EPA believes that by limiting TSS, $BOD_5$ and nutrients will also be effectively controlled, thus effectively limiting their oxygen-demanding load on the receiving water. Quoting (*in italics*) directly from that proposed effluent guideline (67 FR dated September 12, 2002) on page 57891, *"....While the pollutants present in the wastewater from both systems (Editor's Note: 'both systems' refers to 'flow-through' and/or 'recirculating') are largely derived from the solids introduced by animal feed or feces, at flow-through systems the water is flowing through the facility so rapidly there is little opportunity for the solids to break down. Thus, EPA believes that controlling TSS effectively controls the other pollutants present in the wastewater...."* whose origin is fish feed and/or fish feces.

Prior to the publication of the proposed ELG, EPA-New England established NPDES effluent limitations for various fresh-water fish (mainly trout) hatcheries in Massachusetts. The Five-Day Biochemical Oxygen Demand ($BOD_5$) and the TSS limits for those facilities were derived from a review of effluent data from several CAAP facilities located in Massachusetts, New Hampshire, as well as a review of general NPDES permits developed for similar facilities in Idaho, Oregon, and South Carolina. Beginning in late 2001, EPA-New England used Best Professional Judgement to establish permit limits for $BOD_5$ of 5 mg/l for average monthly and 10 mg/l for maximum daily, and for TSS of 10 mg/l for average monthly and 10 mg/l for maximum daily. These Massachusetts fish hatcheries are similar to the fresh-water facilities in New Hampshire.

EPA-New England intends to implement a slightly different approach than one used to limit $BOD_5$ and TSS in the recently issued fish hatchery permits for Massachusetts. Specifically, EPA-New England has decided to slightly increase the maximum daily TSS limit to 15 mg/l to allow for some natural variability between that limit and the average monthly TSS limit. This change brings the difference between the "average monthly" and "maximum daily" concentration inline with that shown in the proposed effluent guideline (5 mg/l difference) as well as other promulgated effluent guidelines where TSS is regulated. In addition, EPA-New England has not limited $BOD_5$ in this hatchery's permit because $BOD_5$ concentrations in the effluent are low as shown by results from recent samples of *overflow water* taken on January 8, 2003. However, the Agency is concerned that the existing concentrations of $BOD_5$ in the effluent could increase above their present levels if the settled solids are not removed on a routine basis by some type a vacuum filtration system, since the direct discharge of cleaning water has been prohibited in this draft permit. In addition, since this hatchery discharges to a small upland watershed which has ongoing diversions and serial reuse of its river water, there are minimal streamflows available in the receiving water to dilute waste products present in the hatchery's large discharge. Therefore, EPA-New England intends to periodically monitor $BOD_5$ to ensure that $BOD_5$ concentrations remain low and also to validate/test the hypothesis that $BOD_5$ concentrations in the discharge, at this site, are being adequately controlled by the TSS limits.

Accordingly, EPA-New England has established in this draft permit for each outfall, effluent limits for TSS at 10 mg/l for average monthly and at 15 mg/l for maximum daily and effluent monitoring requirements for $BOD_5$. For these constituents, sampling frequencies were set at 1/Month for TSS and 2/Year for $BOD_5$ for all raceway and circular tank outfalls that discharge directly to Dickerman Brook. According to 40 CFR Section 122.45(a) effluent limits must be established for each outfall or discharge point of a permitted facility and according to 40 CFR Section 122.44(i)(2) monitoring of those outfalls must be reported at a frequency of no less than once per year. EPA-New England has determined that a sampling frequency of 1/Month for TSS is the minimum needed to ensure that the rearing units are being properly cleaned and the fish are not being overfed. However, EPA-New England has made a one-time exception for the 1/Month sampling each of the 14 outfalls draining the 15 tanks in the Circular C series.

As an interim measure, a representative subset of those outfalls can be selected by the permittee for monthly sampling based on the largest quantity of fish food introduced into each of those rearing units so as to represent a worst-case discharge scenario, until all these outfalls can be connected into one common outfall. Twenty percent, or three outfalls, were deemed a sufficient sample size because each of the tanks: (1) has the same physical dimensions; (2) receives the same quality water from the same (common) header pipe; and (3) discharges at the same flow rate. Furthermore, the Agency believes that for the same effluent discharge rate and inflow quality, the more fish food introduced into a rearing unit, the greater the potential for pollution because, as compared to other tanks, that rearing unit either has a larger fish biomass or the fish are growing at a faster rate, all things being equal. This subset sampling approach further assumes that the fish are not being overfed (i.e., uneaten food which leads to solids in the water column) and that the settled solids in the tank bottoms are properly removed at a frequency sufficient to prevent their re-entrainment in the overflow water. However, over the long term, the Agency is uncomfortable with this interim

approach as a means of determining compliance with TSS limits for the group of unsampled outfalls since the factors assumed to influence effluent quality may not always be valid (e.g., the other tanks may not be cleaned properly and/or the fish may be overfed).

Therefore, until a common outfall pipe is installed or November 30, 2005, is reached, whichever comes first, the permittee is allowed to perform this interim sampling approach. However, should any exceedance of a TSS limit occur from any of the three sampled outfalls during any monthly sampling event, the permittee shall submit a written report detailing/documenting why the TSS exceedance(s) occurred, what steps have been taken to prevent further exceedances, and what documentation/sampling can be produced to show that the remaining unsampled outfalls were likely to have been in compliance with the applicable TSS limit. Beginning in December 2005, all effluent pipes in the Circular C series will be sampled on a monthly basis for TSS. As a further measure, the permittee should consider combining the outfall pipe from Raceway C with the common outfall pipe for the Circular C series, thus having only one outfall for both sets of rearing units.

pH Limits Including Related Conditions

The limits (range) in pH are based upon limits in the current permit in accordance with the antibacksliding requirements found in 40 CFR §122.44(1) since the permittee has been able to achieve consistent compliance with these limits. Historically, the NHDES-WD has required pH limits to be satisfied at end-of-pipe with no allowance for dilution. That concept was codified into the NH Standards at Env-Ws 1703.06(b); therefore, has become a State Water Quality Standard.

However, a change in the pH range in the draft permit due to in-stream dilution would be considered if the applicant can demonstrate, to the satisfaction of NHDES-WD, that the in-stream NH Standards for pH would be protected. Upon satisfactory completion of a demonstration study, the applicant or NHDES-WD may request in writing that the permit limits be modified by EPA-New England to incorporate the results of the demonstration.

Anticipating the situation where NHDES-WD grants a formal approval changing the pH limit(s) to outside the 6.5 to 8.0 Standard Units (S.U.), EPA-New England has added a provision to this draft permit (See SPECIAL CONDITIONS section). That provision will allow EPA-New England to modify the pH limit(s) using a certified letter approach. See STATE PERMIT CONDITIONS in the draft permit. However, the pH limit range cannot be less restrictive than 6.0 - 9.0 S.U. found in various National Effluent Limitation Guidelines.

If the State approves results from a pH demonstration study, this permit's pH limit range can be relaxed in accordance with 40 CFR 122.44(l)(2)(i)(B) because it will be based on new information not available at the time of this permit's issuance. This new information includes results from the pH demonstration study that justifies the application of a less stringent effluent limitation. EPA-New England anticipates that the limit determined from the demonstration study as approved by the NHDES-WD will satisfy all effluent requirements for this discharge category and will comply with NH Standards with regard to instream conditions.

Non-Conventional and Toxic Pollutants

Water-quality based limits for specific toxic pollutants such as chlorine, ammonia, metals, etc. are determined from chemical specific numeric criteria derived from extensive scientific studies. The specific toxic pollutants and their associated toxicity criteria are popularly know as the "Gold Book Criteria" which EPA summarized and published in Quality Criteria for Water, 1986, EPA 440/5-86-001 (as amended). The State of New Hampshire adopted these "Gold Book Criteria", with certain exceptions, and included them as part of the State's recently revised Surface Water Quality Regulations adopted on December 3, 1999. EPA-New England uses these pollutant specific criteria along with available dilution in the receiving water to determine a specific pollutant's draft permit limit, such as the fast acting toxicant chlorine or ammonia, metals, etc.

Total Residual Chlorine

Even though hypochlorite solutions are used at the hatchery, EPA-New England does not believe their use as described earlier in this **Fact Sheet** under "Chemicals, Drugs, and Disinfectants Used Throughout New Hampshire's State Fish Hatcheries" will lead to its presence in the effluent, given that the hypochlorite solutions are not discharged into the culture water and any hypochlorite solution remaining on the equipment is neutralized with sodium thiosulfate prior to its exposure to that culture water. Also, if any residual hypochlorite solution should remain on the equipment following neutralization, it would dissipate in the large volume of culture water prior to its discharge. Therefore, EPA-England has determined that the hatchery's discharge has no reasonable potential to cause, or contribute to an instream excursion above the numeric water-quality criteria for TRC in the NH Standards. However, if a TRC limit was ever needed, a maximum daily limit of 19 µg/l and an average monthly TRC limit of 11 µg/l would be established corresponding to the TRC acute and chronic aquatic-life criteria of 19 and 11 µg/l, respectively, in the NH Standards. Criteria values from the NH Standards would become the limits because there is no available dilution in the receiving water.

Nutrients (Nitrogen and Phosphorus)

The permittee should be aware that EPA has published recommended water-quality criteria for nutrients, such as Total Phosphorus and Total Nitrogen, as well as other response parameters, such as turbidity and chlorophyll *a*, to control the excessive levels of nutrients in discharges to the nation's surface waters. The recommended criteria cover four major types of waterbodies – lakes and reservoirs, rivers and streams, estuarine and coastal areas, and wetlands across the major Ecoregions of the United States. EPA's recommended Section 304(a) criteria are intended to provide for the protection and propagation of aquatic life and recreation. As the reader can see, the Hatchery's discharge could be impacted by the criteria for the rivers and streams category. The NHDES-WD has indicated to EPA-New England that it intends to adopted either EPA's recommended nutrient criteria or a version of them in their next revision of the NH Standards. Published results to date from EPA's ***Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion XIV*, EPA, Office of Water, EPA 822-B-00-022, December 2000**, indicate that for subecoregion 59 (Hatchery's location within Ecoregion XIV) criteria values around 0.008 mg/l for Total Phosphorus (dissolved plus particulate) as P and 0.32 mg/l for Total Nitrogen

(ammonia, organic, nitrate and nitrite) as N are reasonable estimates for purposes of this discussion. When these criteria are established in the NH Standards, they will become the limits that the hatchery's discharge must meet, given its available dilution of 1.0 with the receiving water. In this approach, EPA proposes to establish two "casual" parameters, those for nitrogen and phosphorus, and two "response" parameters, those for chlorophyl a and a measure of water clarity - secchi disk for lakes and turbidity for other waterbodies such as rivers and streams.

Accordingly, the draft permit requires total nitrogen and total phosphorus monitoring to be performed twice per year at the same time as $BOD_5$ in order to obtain data necessary to evaluate the impact of these pollutant on the quality of the receiving water. The Agency expects that the ban on direct discharge of cleaning waters, coupled with efforts to minimize overfeeding (fish food has a phosphorus content that varies from 1 to 1.2 %), will minimize nutrient discharges from these sources.

## Dissolved Oxygen

The NH Standards require that the instream dissolved-oxygen content be at least 75 % of saturation, based on a daily average, and that the instantaneous minimum dissolved-oxygen concentration be at least 5 mg/l for Class B waters [see Env-Ws 1703.07(b)].

There are several factors which make effluent dissolved oxygen a special concern in this case. These are: (1) effluent flows from the hatchery make up the majority of the receiving stream's flow during low-flow periods, meaning that low effluent dissolved-oxygen concentrations could significantly depress in-stream concentrations, and (2) the appearance of small reaeration potential in the stretch of receiving water between the upper and lower hatcheries, meaning that dissolved-oxygen concentrations in Dickerman Pond could be significantly affected by the discharges from the upper hatchery, particularly if oxygen demand from effluent $BOD_5$ or degradation of formalin is significant. Dissolved oxygen in Dickerman Brook between the upper and lower hatcheries should also be of concern to the permittee given that this water is used as the intake water for the lower hatchery.

Accordingly, it is critical that effluent dissolved-oxygen concentrations be maintained at levels that will not cause or contribute to violations of NH Standards. The draft permit requires regular monitoring of the effluent for dissolved-oxygen concentration and also requires special monitoring at times when formalin is being used. The permit further requires that the percent saturation be calculated from the dissolved-oxygen concentration to determine if the discharge causes or contributes to exceedances of that part of the NH Standards in Dickerman Brook.

Formalin

CAAP facilities commonly use biocides. The most common of which are formalin products such as Paracide-F, Formalin-F or Parasite-S which contain approximately 37 % by weight formaldehyde gas. Formalin is used for the therapeutic treatment of fungal infections on the eggs of finfish and to control certain external protozoa and monogenetic trematodes on all finfish species. This means that formalin is more toxic to the invertebrate species than to vertebrates, for it is formulated to selectively kill certain attached organisms, but not the finfish themselves when properly applied. Therefore, when setting the necessary permit limits to protect the receiving water's aquatic environment from the effects of formalin in a discharge, it is more important to develop limits to protect invertebrates species over the vertebrates species, for the former are more sensitive to the effects of formalin's active ingredient (formaldehyde). In the receiving waters, these invertebrates are an integral part of the food chain for finfish.

Formalin use should be consistent with U.S. Food and Drug Administration (FDA) labeling instructions as per 21 CFR Section 529.1030. Per those instructions, formalin is to be used only 1-hour per day per raceway, tank and/or in-line settling pond for the treatment of finfish. Finfish eggs may be treated 15 minutes per day following FDA guidelines. Prophylactic use of formalin is strictly prohibited.

Existing toxicity data indicates that formalin is toxic to aquatic organisms at concentrations below FDA labeling guidelines. Currently there are no acute and chronic aquatic-life criteria for either formalin or formaldehyde in the NH Standards. However, New Hampshire law states that, "all surface waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life;...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Ws 1703.21(a)(1). Therefore, in the absences of specific formalin or formaldehyde aquatic-life acute and chronic criteria in the NH Standards, EPA-New England has decided to impose formaldehyde limits in the draft permit based on acute and chronic aquatic-life criteria taken from the ***Derivation of Ambient Water Quality Criteria for Formaldehyde*, Hohreiter, David W. and Rigg, David K., Journal of Science for Environmental Technology in Chemosphere, Vol. 45, Issues 4-5, November 2001, pgs. 471-486**, thus ensuring Env-Ws 1703.21(a)(1) is satisfied. EPA-New England believes that since these criteria were developed in accordance with the United States Environmental Protection Agency's (USEPA's) ***Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*** they are appropriate for use in limit setting purposes. From that publication, the acute and chronic aquatic-life criteria for formaldehyde are 4.58 and 1.61 mg/l, respectively. However, because formalin is a solution composed of 37 % formaldehyde, each acute and chronic aquatic-life criteria for formaldehyde needs to be divided by 0.37 to convert to its equivalent formalin acute and chronic aquatic-life criteria of 12.38 and 4.35 mg/l, respectively. Accordingly, since the effluent will be analyzed for formaldehyde, average monthly and maximum daily limits for formaldehyde of 1.6 and 4.6 mg/l, respectively, have been set in the draft permit. Because available dilution in the receiving water at 7Q10 flow is 1.0, or no dilution, the acute aquatic-life criteria becomes the maximum daily limit and the chronic aquatic-life criteria becomes the average monthly limit.

These limits apply at all times, but the monitoring requirements in the draft permit are "when-in-

use", since formalin is used sparingly at the New Hampton hatchery. Specifically, their application shows typical usage is around 150 gallons per year with some years having no usage.

For this permit, the minimum quantification level (ML) for formaldehyde is established in Method 1667, Revision A is 0.050 mg/l or 50 µg/l. In accordance with EPA's ***Technical Support Document for Water Quality-based Toxics Control***, **EPA/505/2-90-001, March 1991**, page 111, EPA New England is defining the compliance level for this particular analytical method as the minimum quantification level (ML) in this permit.

Therefore, the limit at which compliance/non-compliance determinations will be judged for this particular analytical method is a ML of 50 µg/l and this ML value may be reduced by permit modification as more sensitive test methods are approved by EPA. Specifically, this means that sample results reported at or above the ML shall be reported as observed; whereas, any sample result reported below the ML shall be reported as zero until written notice is received by certified mail from EPA-New England indicating some value other than zero is to be reported for a given ML (i.e., between zero and the ML).

Best Management Practices

Pursuant to Section 304(e) of the ACT and 40 CFR Sections 122.2 and 122.44(k), a Best Management Practices (BMP) Plan may be expressly incorporated into a NPDES permit, on a case-by-case basis, when necessary to carry out provisions of the ACT under Section 402(a)(1). Because the permittee conducts operations which could result in solids as well as biological, chemical, and medicinal pollutants reaching the receiving waters via the effluent, the draft permit requires the facility to develop a BMP Plan to prevent, control and abate the discharge of these pollutants to the greatest extent possible.

In essence, the BMP requirement in the draft permit directs the permittee to: (1) review its operating procedures; (2) describe its biological pollution control; (3) describe its cleaning of culture tanks, raceways, lagoons, and other equipment; (4) describe its training for employees, and (5) list all medications and chemicals used at the facility. This review should assure that, along with any on-site treatment, that all the numeric limits in the draft permit will be met at all times and that discharges of pollutants not limited in the permit are minimized. The objective of this review is to minimize the potential discharge of any pollutant due to facility design, human error or equipment failure.

The draft permit requires permittees to develop and to implement a BMP Plan no later than 90 days after the effective date of coverage under this permit. The BMP Plan, upon implementation, becomes a supporting element to the permit's numeric effluent limitations by minimizing the discharge of any pollutant (solids, biological, chemical, and medicinal) through the proper operation of the facility. Consequently, the BMP Plan is as equally enforceable as the permit's numeric limits.

C. Antidegradation

This draft permit is being reissued with allowable wasteloads and parameter coverages more stringent and comprehensive than in the current permit with no change in location for the existing outfall. The State of New Hampshire has indicated that there is no lowering of water quality and no loss of existing water uses and that no additional antidegradation review is warranted at this time.

D. Additional Requirements and Conditions

The effluent monitoring requirements in the draft permit, and shown in Table 1 on the next page have been established to yield data representative of the discharge under the authority of Section 308(a) of the ACT in accordance with 40 CFR §§§ 122.41(j), 122.44(i) and 122.48. It is the intent of EPA and NHDES-WD to establish minimum monitoring frequencies in all NPDES permits at permit modification and/or reissuances that make sense from both an environmental and human health perspectives. Compliance monitoring frequency and sample type have been set after considering the intended purpose and use of the data, configuration of the physical plant including its flow and feeding regimes at the hatchery. Normally, monitoring frequencies in NPDES permits issued in New Hampshire are set according to a EPA/NHDES-WD's Effluent Monitoring Guidance (EMG) mutually agreed upon and first implemented in March 1993 and last revised on July 19, 1999. However, because that guidance was developed for use in permitting Publicly Owned Treatment Works (POTWs) and industrial facilities, it is not applicable to hatcheries; therefore, has not been used to set monitoring frequencies in this draft permit. See Table 1 for a comparison of sampling frequencies and sample types in the current versus new draft permits.

The effluent monitoring requirements in the draft permit have been established to yield data representative of the discharge under the authority of Section 308(a) of the ACT in accordance with 40 CFR §122.41(j), §122.44(i) and §122.48.

The remaining conditions of the permit are based on the NPDES regulations 40 CFR, Parts 122 through 125, and consist primarily of management requirements common to all permits.

Table 1. Sampling Frequencies and Sample Types in the Current and Draft Permits. (Changes to Current Permit are highlighted under Draft Permit. In addition, a "M" or "L" below the Parameter indicates it's either "Monitored-Only" or "Limited" in the draft permit.)

| PARAMETER | CURRENT PERMIT | | DRAFT PERMIT | |
|---|---|---|---|---|
| | Sampling Frequency | Sample Type | Sampling Frequency | Sample Type |
| Settleable Solids | 1/Month | 3 Grabs | Eliminated | Eliminated |
| Flow (M) | Not Required | Not Required | 1/Week | Weir calculation or other approved method |
| pH (L) | Not Required | Not Required | 1/Week | Grab |
| TSS (L) | Not Required | Not Required | 1/Month | 24-Hour Composite |
| $BOD_5$ (M) | Not Required | Not Required | May and August | 24-Hour Composite |
| Total Nitrogen (as N) (M) | Not Required | Not Required | May and August | 24-Hour Composite |
| Total Phosphorus (as P) (M) | Not Required | Not Required | May and August | 24-Hour Composite |
| Fish Biomass on Hand (M) | Not Required | Not Required, but are reporting | Monthly | Calculation |
| Fish Feed Used (M) | Not Required | Not Required | Monthly | Calculation |
| Efficiency of Fish Feed Used (M) | Not Required | Not Required | Monthly | Calculation |
| Dissolved Oxygen (M) | Not Required | Not Required | 1/Month (Formalin Absent) | Grab |
| Dissolved Oxygen Saturation (M) | Not Required | Not Required | 1/Month (Formalin Absent) | Calculation |
| Water Temperature (M) | Not Required | Not Required | 1/Month (Formalin Absent) | Grab |
| Formaldehyde (L) | Not Required | Not Required | 1/Week (Formalin Present) | Grab |
| Dissolved Oxygen (M) | Not Required | Not Required | 1/Week (Formalin Present) | Grab |

**V. Essential Fish Habitat.**

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.(1998)), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b). The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. § 1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50 CFR § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

EFH is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

EFH Species

Dickerman Brook is a tributary of the Pemigewasset River which, in turn, is a tributary of the Merrimack River, and as such both Dickerman Brook and the Pemigewasset River are designated EFH for Atlantic salmon (*Salmo salar*) because the Merrimack River has been designated EFH status for Atlantic salmon ".....including all tributaries to the extent they are currently or were historically accessible for salmon migration". According to the NHF&GD, there is no stocking of Dickerman Brook either upstream or downstream of Dickerman Pond nor along the Pemigewasset River in the immediate vicinity of the Brook's discharge due to backwater effects from a dam on the Pemigewasset River just downstream from the Brook. In addition, the NHF&GD indicates there is no access for stocking lower Dickerman Brook, and because of the short stretch between the hatchery and the Pemigewasset River, it has not been evaluated by NHF&GD for habitat suitability.

Analysis of Effects

This draft permit has been written to satisfy NH Standards which are considered by EPA- New England and the NHDES-WD to be protective of all aquatic species including those fish listed under EFH, in this case Atlantic salmon (*Salmo salar*), as well as other lesser aquatic organisms. Therefore, there should be no impacts to the water quality or the habitat of the receiving water or immediately downstream waters, such as the Pemigewasset River, as a result of this discharge for the EFH species of concern.

EPA-New England's Opinion of Probable Impacts

Based on the permit limitations and requirements specified in the draft permit and discussed in the Fact Sheet that are designed to protect aquatic species, this authorized discharge is not likely to adversely affect the federally managed species, their forage or their habitat in the receiving water

or downstream of Dickerman Brook. This is particularly true given that all "cleaning water" discharges from all the rearing units have been prohibited. If adverse effects do occur in the receiving water or downstream of Dickerman Brook as a result of this permit action, or if new information becomes available that changes the basis for this conclusion, then NMFS will be notified and consultation will be promptly initiated.

Mitigation

The EPA-New England considers the conditions in this draft permit to be sufficient to protect the EFH species of concern, namely Atlantic salmon (*Salmo salar*); therefore, does not consider further mitigation to be warranted at this time.

## VI. State Certification Requirements.

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate the State's Surface Water Quality Regulations or waives its right to certify as set forth in 40 CFR §124.53.

Upon public noticing of the draft permit, EPA-New England is formally requesting that the State's certifying authority make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

The NHDES-WD is the certifying authority. EPA-New England has discussed this draft permit with the staff of the Water Division and expects that the draft permit will be certified. Regulations governing State Certification are set forth in 40 CFR §§124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the ACT, Sections 208(e), 301, 302, 303, 306 and 307 and with appropriate requirements of State law. In addition, the State should provide a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law. Since certification is provided prior to permit issuance, failure to provide this statement for any condition waives the right to certify or object to any less stringent condition which may be established by EPA-New England during the permit issuance process following public noticing as a result of information received during that noticing. If the State believes that any conditions more stringent than those contained in the draft permit are necessary to meet the requirements of either the ACT or State law, the State should include such conditions and, in each case, cite the ACT or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition.

Reviews and appeals of limitations and conditions attributable to State Certification shall be made through the applicable procedures of the State and may not be made through the applicable

procedures of 40 CFR Part 124.

**VII. Comment Period, Hearing Requests, and Procedures for Final Decisions.**

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to: Mr. Roger A. Janson, Director NPDES Permit Program, U.S. Environmental Protection Agency, One Congress Street, Suite 1100 (Mail Code: CPE), Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least 30 days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA-New England's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

**VIII. EPA/State Contacts.**

Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays from:

**Mr. Frederick B. Gay, Environmental Engineer**
**U.S. Environmental Protection Agency**
**Office of Ecosystem Protection**
**NPDES Permits Unit**
**One Congress Street**
**Suite 1100, Mail Code: CPE**
**Boston, Massachusetts 02114-2023**
**Telephone No.: (617) 918-1297**
**FAX No.: (617) 918-0297**

_____ **Linda M. Murphy, Director**
**Date:** **Office of Ecosystem Protection**
**U.S. Environmental Protection Agency**

## ATTACHMENT A

This attachment is for CAAP facilities regulations.

**CAAP REGULATIONS ATTACHED BY STAPLE TO BACK OF THIS PAGE**

## ATTACHMENT B

This attachment is for the overview map of the area–that is the USGS Topographic Map.

**OVERVIEW MAP ATTACHED BY STAPLE TO BACK OF THIS PAGE**

**ATTACHMENT C**

Water Flow Diagram to/from Rearing Units –Upper Hatchery Complex at New Hampton

**ATTACHMENT C** (Continued)

Water Flow Diagram to/from Rearing Units –Lower Hatchery Complex at New Hampton