UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA NEW ENGLAND
OFFICE OF ECOSYSTEM PROTECTION
ONE CONGRESS STREET
SUITE 1100 (MAIL CODE: CMP)
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:

CONTENTS: Twenty-nine pages including four Attachments (A through D).

NPDES PERMIT NO.: NH0000736

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

Warren State Fish Hatchery
Route 25
Warren, New Hampshire

Mailing Address

New Hampshire Fish and Game Department
Warren State Fish Hatchery
c/o Superintendent
P.O. Box 75
Warren, New Hampshire 03279

RECEIVING WATER: Patch 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, the 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 Warren State Fish Hatchery, a concentrated aquatic animal production (CAAP) facility. Presently, this state owned and operated facility is engaged in rearing various species of trout (eastern brook, rainbow and brown) hatched from eggs at other NHF&GD hatcheries and transferred as fingerlings (3 inches) to Warren for grow out to stockable size, and Atlantic salmon hatched (at Warren) from eggs to swim-up fry. All three species of trout are stocked at yearling size (9 inches long) with an average age of 15 to 18 months at stocking with a portion of the eastern brook trout population also stocked at two year old size (14 inches long in June). Atlantic salmon are stocked just before their swim-up life stage begins. All fish from this facility are used for fisheries management (stocking) in selected rivers and streams through New Hampshire with the focus of the salmon stocking being on the Atlantic salmon restoration program in the Connecticut and Merrimack River watersheds.

Discharges from CAAP operations, such as Warren'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).

EPA-New England is proposing an NPDES permit for this CAAP facility. A CAAP facility 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." [See **Attachment A** for 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.] Specifically, appendix C defines a CAAP as a facility that discharges at least 30 days per year, but excludes those facilities which produce less than 20,000 pounds (lbs) of harvestable weight of fish in a given year and which feed less than 5,000 lbs of food during the calendar month of maximum feeding. EPA-New England has interpreted this exclusion to mean that if a facility exceeds either of these criteria ("harvestable weight" or "maximum calendar month feed amount") the exclusion does not apply. Accordingly, EPA-New England has designated

the Warren hatchery as a CAAP facility because its application dated August 29, 2002 and its monthly Discharge Monitoring Reports (DMRs) submitted as part of compliance with its current NPDES permit, shows that Warren discharges more than 30 days in a given year and routinely produces more than 20,000 pounds (lbs) of harvestable weight of fish in a given year, even though it routinely uses less than 5,000 lbs of food during the calendar month of maximum feeding. On their application, NHF&GD reported a maximum feeding rate of 2,690 lbs in September. According to their DMRs, maximum fish biomass in the rearing units were 23,996 lbs in February 2001, 22,903 lbs in March 2002, 14,658 lbs in March 2003 and 25,889 lbs in February 2004.

Fish biomass production targets are set by the NHF&GD for each of its six fish hatcheries as part of its species management plan for stocking New Hampshire's waterways. Warren's annual production targets by species are: eastern brown trout (EBT) at 6,273 lbs, rainbow trout (RT) at 9,678 lbs, and brown trout (BT) at 1,049 lbs for a total of 17,000 lbs, with a capacity to incubate 5.0 million eggs even though the facility generally incubates around 2.3 million eggs (trout and/or salmon). Presently, Atlantic Salmon eggs are the only ones incubated. In any given year, actual (net or harvestable weight) fish production can vary ± 10 percent (%) from this target to allow for accuracy and variability in growth from year to year. For example, in State fiscal year (FY)-2001 (July 1st through June 30th), 20,846 lbs of fish were produced using 26,407 lbs of feed and in FY-2002, 23,834 lbs of fish were produced using 24,449 lbs of feed, whereas, in FY-2003, the hatchery produced 19,924 lbs of fish, all of which substantiates the Agency's position that the production level routinely exceeds 20,000 lbs per year or is just under that level.

The Warren 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 and 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 a series of 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. Due to updated permit requirements, some types of discharge, such as cleaning water, will not be authorized by the draft permit. The location of the Warren hatchery and the receiving water (Patch Brook) to which the hatchery's various rearing units discharge are shown on a copy of a U.S. Geological Survey Topographic map (See **Attachment B**) submitted with their application.

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

The Warren Fish Hatchery is located just off Route 25 on Fish Hatchery Road in the Town of Warren on a 13.6 acre parcel of land **(Attachment B**) that is in close proximity to the White Mountain National Forest. This hatchery was first established by the NHF&GD in 1915. All domestic wastewater discharges to an on-site septic tank with multiple leach field systems and all floor drains in the various working buildings have been plugged with concrete.

Various fish rearing units at this hatchery complex consist of 1 Hatchery House with Annex, 13 Rectangular Raceways, 1 Public Relations Pond and 2 Show Pools, all of which are shown in **Attachment C**. Except for the 2 Show Pools, the culture units are used to rear three species of trout from fingerling to yearling size with some up to 2-years old in size for stocking, and to incubate salmon eggs for stocking just prior to their swim-up life stage. In the Show Pools, a variety of trout and salmon are kept for public viewing and feeding, but not for stocking purposes. Culture water from all rearing units, including the Show Pools, discharge on a regular basis through a series of outfalls to Patch Brook (a water of the United States) whose river channel is adjacent to or in close vicinity of the various rearing units. At any given time, not all the culture units are in use; however, just before the annual stocking the fish biomass (fish of stockable size) in the rearing units is usually at its yearly maximum, which routinely occurs during the period of February through April, with the bulk of stocking taking place in May into early June each year.

Water for all the rearing units is obtained from three gravel-packed wells and a series of free-flowing spring points that were driven into natural seepage areas (springs) to enhance that natural seepage. Water pumped from these wells discharges into a ponded area created around the springs or into the Feed Reservoir located just upstream of the Upper Reservoir Pond rearing unit. From there, this water flows freely (by gravity) to all units, with it being serially reused from one unit to the next for many of the culture units. Low-pressure aeration has been installed in the Feed Reservoir just upstream of the rearing unit named Upper Reservoir Pond and in the three rearing units named Spring, Round and Long Ponds **(See Attachment C)**. This aerated water then flows into all remaining rearing units. The reader is referred to Table 1 for a list of the primary water sources and to Table 2 for the estimated flow rates of overflow water from rearing units when operated at full capacity. The reader is also referred to **Attachment C** for a generalized water-flow diagram that includes water sources, rearing units and their respective outfalls and piping networks. Because the direct discharge of cleaning water, absent treatment, will not be allowed at permit reissuance, only those outfalls permitted to discharge overflow water are shown in that diagram (Pipes dedicated to the discharge of only cleaning water are not shown.)

Table 1. --*Water Sources Available to Serve Various Fish Rearing Units*

Water Source	Reported Range in Flows, in gallons per minute (gpm)
#1 Gravel-Packed Well	Capacity around 90 to 100 gpm
#2 Gravel-Packed Well	Capacity up to 240 gpm
#3 Gravel-Packed Well	Capacity rated at 500 gpm
Free Flowing Spring Points	Capacity around 200 to 350 gpm, but these flows can totally dry-up during drought periods

Table 2. --*Estimates of Average Daily Flow Rates of Overflow Water that Discharge to Patch Brook*

from Rearing Units when Operated at Full Capacity
(Abbreviations gpm and mgd stand for "gallons per minute" and "million gallons per day", respectively)

Rainbow Pond (Outfall 003)	Public Relations Pond (Outfall 005)	Annex to Hatchery House (Outfall 006)	Hatchery House (Outfall 007)	Show Pool (Outfall 008)
650 gpm 0.94 mgd	50 gpm 0.072 mgd	60 gpm 0.086 mgd (Seasonal discharge of around 1.5 months)	150 gpm 0.22 mgd (Seasonal discharge of around 5.5 months)	35 gpm 0.050mgd

Fish in the various rearing units are fed during daylight hours by hand broadcasting fish food onto the surface of each active rearing unit at a frequency and size (granule/pellet) that depends on the age/size of the fish being reared. Normally, feeding ranges from 7 to 8 times per day for hatched eggs (fish first swim-up looking for food) through the fingerling stage (3 inches), which reduces to 3 times per day for the fingerling plus stage, which is then further reduced to 1 per day for yearling (9 inches) and older life stages. The composition of this fish food varies from a high of around 55 to 57 % protein and 1.2 % phosphate for the youngest fish up through fingerling in size, to a low of around 43 % protein and 1.0 % phosphate for fish 6 to 8 inches and larger in size. The size of this feed ranges from 0.25 to 0.56 millimeters (mm) for fish less than 1-inch in length to 3 to 6 mm for fish 6 to 8 inches and larger.

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 during the cleaning process. For permit purposes, hatcheries have 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 insignificant concentrations of solids and, "cleaning water" which contains significant concentrations of settled solids from the bottom of individual rearing units. Cleaning water is herein defined as "water that contains settled solids that have accumulated on the bottom of active rearing units and that is discharged along with a portion of the culture water directly to the receiving water during periodic cleaning operations". Due to the piping network at Warren, all solids contained in both the "overflow water" or the "cleaning water" flow are presently discharged without treatment to waters of the United States; however, the bulk of the solids is discharged with the "cleaning water". The only exception is the Public Relations Pond, which only discharges "overflow water" for it has no discharge of "cleaning water".

The water level in each of the rectangular shaped raceways, all of which have concrete sides and a sandy bottom, is controlled by flash boards at the downstream end of each raceway. Just upstream of the flash boards (also called stop logs) are the fish retaining racks (screens) to keep fish in the raceway. 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. In some of those flash boards, a circular hole has been cut in the lower center portion and blocked with a removable paddle for use in cleaning. For the latter situation, the cleaning drain is

located in the bottom of the raceway just downstream of the paddle assembly, otherwise it's located in the bottom of the upstream quiescent zone. At regular intervals, settled solids are removed from the quiescent zone along with a portion of the "flow through" water by opening the cleaning drain in the bottom of the quiescent zone, or by removing the paddle and opening the cleaning drain in the bottom of the raceway just downstream of the paddle assembly, 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 located at the downstream end of the raceway. At Warren, about 3/4 of the raceway's water volume is discharged through the cleaning water drain during the manual cleaning operation which takes a few minutes (usually less than 10 minutes). Normally, fish remain in their rearing units during these bottom cleaning operations. When in use, all rearing units require routine cleaning at frequencies that range from once per day for newly hatched fish to once per week for young fish to once every two weeks for older fish or as determined by the fish culturist.

Table 3 on the next page summarizes the various types of overflow and cleaning water discharges by outfall and rearing unit as they currently exist. However, in the near future, the NHF&GD may consolidate outfall pipes to save on sampling (analytical) costs.

Table 3. --*List of Discharges (Outfalls) to Receiving Water as Presently Exists (Pre-Draft Permit)*
[Refer to **Attachment C** for locations of outfall and rearing unit.]

Outfall Number	**Receiving Water**	**Discharging Unit(s)**	**Type of Discharge Water(s)**
001	Patch Brook	Spring and Round Ponds	Cleaning water from both ponds. In the future, this outfall may have discharges of only overflow water that could be periodic especially when downstream rearing units are off-line
002	Patch Brook	Upper, Middle and Lower Reservoir Ponds; Above Bridge, Bridge and Lower Bridge Ponds; No. 8 Pond; and Long Pond	Cleaning water from up to 8 ponds hydraulically connected upstream of outfall. In the future, this outfall may have discharges of only overflow water that could be periodic especially when downstream rearing units are off-line
003	Patch Brook	Spring and Round Ponds Upper, Middle and Lower Reservoir Ponds; Above Bridge, Bridge and Below Bridge Ponds; No. 8 Pond; Long Pond; First and Second Little Ponds; and Rainbow Pond	Overflow water from all 13 ponds hydraulically connected upstream of outfall
004	Patch Brook	Upper, Middle and Lower Reservoir Ponds; Above Bridge, Bridge and Below Bridge Ponds; No. 8 Pond; Long Pond; First and Second Little Ponds; and Rainbow Pond	Cleaning water from up to 11 ponds that are hydraulically connected upstream of outfall. This outfall will not be carried forward into the draft permit for it only discharges cleaning water which will not be authorized by the draft permit
005	Patch Brook	Public Relations Pond	Overflow water
006	Patch Brook	Annex to Hatchery House contains 8 raceways for rearing hatched eggs to fingerling size	Overflow and cleaning waters
007	Patch Brook	Hatchery House contains egg incubation trays and 2 raceways for rearing hatched eggs to fingerling size	Overflow water from egg trays; and overflow and cleaning waters from 2 raceways when in use
008	Patch Brook	Two Show Pools	Overflow and cleaning waters

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

Normally, fish hatched from eggs in the State's hatchery system 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 Warren 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 (limit their use) 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.

- **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 baths, 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 the hatchery needs 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 Warren Hatchery

- **Formalin - 37 % Formaldehyde Gas in Water with 16 % Methanol**
- **Polyvinylpyrrolidone (Iodine in 10 % aqueous solution) --Also called Povidone Iodine**
- **Sodium Chloride (Crystalline Form)**
- **Sodium Hypochlorite at 5.25 % (Ordinary Household Bleach in Liquid Form**)

A quantitative description of significant effluent parameters from the current permit's effluent-monitoring data collected for this facility during the 36-month period July 2001 through June 2004 show: average monthly settleable solids (SS) ranged from <0.01 to 0.10 milliliters per liter; average monthly flow ranged from 0.50 to 1.0 mgd; and the resident fish biomass population ranged from a low of 6,028 lbs in July (2001) to a high of 25,889 lbs in February (2004) just before the State's annual spring stocking. Compliance monitoring for SS limit in the current permit is based on a net calculation of effluent minus influent sampling results of the receiving water and not on effluent

results from sampling individual outfalls. Specifically, the current permit requires sampling results of the influent, (Feed Reservoir that flows into Upper Reservoir Pond) subtracted from the effluent (Patch Brook at upstream side of Fish Hatchery Road). The reader is referred to **Attachment C** for approximate locations of these sampling points. However, in the draft permit this practice will be replaced with monitorings from individual outfalls.

Several effluent parameters in the current permit were deleted by Region I (also now referred to as EPA-New England) 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 Warren'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 New Department of Environmental Services, Water Division (NHDES-WD) personnel.

In a variety of recent permit reissuances 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, in the draft permit, the Agency has chosen to monitor, but not limit TSS 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.

Because both trout and salmon belong to the same family, *Salmonidae*, they have similar metabolisms and habitat requirements that allow them to coexist in the same stream, thus this draft permit allows for the growth of both species at this facility.

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 general, statutory deadlines for meeting technology-based guidelines (effluent limitations) established pursuant to the ACT have expired. For instance, compliance with the newly promulgated effluent limitations guidelines for fish hatcheries is, effectively, from date of permit issuance [40 CFR Section125.3(a)(1)(ii)]. Compliance schedules and deadlines not in accordance with the statutory provisions of the ACT cannot be authorized by a NPDES permit.

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 waterbody or a segment of a waterbody; (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 the flow that is used for both maximum daily and average monthly limits as long as that 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 the Warren Hatchery

Technology-Based Effluent Limitations

On August 23, 2004, the Agency promulgated new Effluent Limitations Guidelines and New Source Performance Standards (hereinafter referred to as ELGs) for discharges from Concentrated Aquatic Animal Production (CAAP) facilities as defined at 40 CFR Section 122.24 and Appendix C of 40 CFR Part 122. Typically, ELGs express effluent limitations in the form of numeric standards for specific pollutants, but this ELG expresses effluent limitations in the form of narrative standards in order to achieve reduced discharges of total suspended solids (TSS) and other materials that are generated during the process of culturing (raising) fish. These new ELGs apply to the discharge of pollutants from facilities that produce 100,000 lbs or more of aquatic animals per year using flow-through, recirculating, net pen or submerged cage systems and became effective on September 22, 2004 [See Federal Register (FR) on August 23, 2004 (69 FR 51892-51930)].

Even though the Warren hatchery produces less than 100,000 lbs of aquatic animals per year, EPA-England has made a BPJ determination to apply the recently promulgated ELG's for CAAP because this hatchery: (1) meets the definition of a CAAP at 40 CFR Section 122.24(b); (2) operates flow-through type rearing units; and (3) discharges to waters of the United States, specifically Patch Brook, whose streamflow is reported by the applicant to *"not flow in the summer if it were not for our discharge. It [Editor's note: means Patch Brook] dries up above the facility*." At a minimum, this means Warren needs to develop and implement operational measures in the form of Best Management Practices (BMP) to reduce the discharge of solids, that is uneaten fish food and feces, to Patch Brook to protect the Brook's minimal assimilative capacity particularly during low-flow periods. A BMP plan is precisely what the newly promulgated ELG for CAAP facilities requires, among other things. In the absence of published technology-based effluent guidelines, such as those for CAAP facilities with aquatic animal production of less than 100,000 lbs, the permit engineer is authorized under Section 402(a)(1)(B) of the ACT to establish effluent limitations, which in this case is narrative limitations, on a case-by-case basis using Best Professional Judgement (BPJ).

Accordingly, the general reporting requirements detailed in 40 CFR Section 451.3 have been incorporated into the draft permit. They require the permittee to report drug usage, spills, structural failure and/or damage to rearing units as well as to develop, implement and maintain a best management practices (BMP) plan for the facility. The BMP must address solids control, materials storage, structural maintenance of culture units and related equipment, recordkeeping and training at the hatchery. Section 451.3 also allows the permitting authority to modify the required BMP plan requirements based on its exercise of best professional judgement (BPJ). Based on the Agency's BPJ authority, three additional categories have been added to the draft permit: (1) detailing precautions taken to prevent aquatic organisms that are not indigenous nor naturalized to New Hampshire waters from becoming established in local surface waters; (2) identifying and quantifying all aquaculture drugs and chemicals used at this facility; and (3) describing where settled solids are placed after removal from culture units. The Agency believes these additional requirements are needed to protect the receiving waters from release of non-indigenous species and to better understand the full range of aquaculture drugs and chemicals used in the treatment of pathogens at

this facility and their potential for discharge to the environment.

One of the BMP plan requirements stipulated in Section 451.11(a) requires the permittee to implement procedures for the routine cleaning of rearing units and off-line settling basins to minimize the discharge of accumulated solids from settling ponds and basins and production systems. This hatchery employees quiescent zones in the rearing units/culture water tanks as the primary means of removing settled solids in the culture unit. Periodically, a plug in the bottom of the quiescent zone is opened and the scouring action created by culture water moving to and through this opening suspends and removes the accumulated bottom sediments discharging them directly to the receiving water. In the preamble of Part 451 ELGs (69 FR page 51908), "EPA has determined that primary treatment in the form of quiescent zones in the culture water tanks and settling ponds by themselves are not the best technology available for treating TSS. Instead, rigorous feed management in conjunction with good solids handling practice constitutes a better technology for controlling this pollutant." [Editor's note: "...this pollutant" means TSS] EPA-New England has made a BPJ determination as allowed in 40 CFR Section 451.11 that the direct discharge of settled solids from active rearing units to a receiving water absent any form of off-line settling or equivalent solids removal does not constitute "good solids handling practice"; therefore, EPA-New England has decided to prohibit this practice in the draft permit since the intent of these regulations and the ACT is to "...reduce the pollutant loads discharged to the receiving streams."

Even though the CAAP's ELG does not require monitoring to judge the effectiveness of the BMP plan, there is no prohibition against such monitorings in the newly promulgated regulations. Monitoring will ascertain the range of pollutant concentrations discharged to the receiving water from individual rearing units, thus enabling the Agency to determine if those levels of suspended solids and associated biodegradable loads cause or contribute to an exceedance of NH Standards (detrimental effect on the receiving water). Therefore, EPA-New England has decided to require monitoring (report only, no limits), on a quarterly basis, the concentrations and loads of TSS and Biochemical Oxygen Demand (BOD_5) in the overflow water discharged from the various rearing units to, among other things, monitor the effectiveness of the BMP plan and the no direct discharge of cleaning water.

Disposal Options for Settled Solids in Cleaning Water

The NHF&GD's current strategy is to use portable vacuum systems to remove settled solids from the bottom of rearing units (raceways, tanks and/or ponds) whose discharge does not pass through either an in-line or off-line settling pond before discharge to the receiving water. For those rearing units with no settling, the NHF&GD first tries to redirect its discharge to an existing settling pond through re-piping, but if that is not feasible, then vacuuming becomes necessary.

At the Warren hatchery, the only rearing unit with any settling prior to its discharge is the Public Relations Pond. This means that to clean all remaining rearing units a portable vacuum system will be needed to remove settled solids. As a result, the hatchery needs to develop on-site storage capacity for its vacuumed solids until final disposal can be arranged. At Warren, that could mean using the Public Relations Pond, digging a new on-site settling pond, or removing one of the

rectangular rearing units from fish production for storage of vacuumed solids. Placement of solids in settling ponds has the potential for resuspension and discharge, and for nutrient enrichment that could result in elevated levels of chlorophyll-*a* (chl-*a)*, and turbidity in the pond's discharge. Additional options under active consideration are construction of solids collection/containment vessels, such as clarifiers, that would separate (concentrate) solids from the water entrained during vacuuming. Disposal of solids from a containment vessel would be more manageable and more efficient in the long term than placement of vacuumed solids directly into on-site settling ponds which, in time, would likely require these ponds to be drained and then cleaned.

Disposal of settled solids removed from rearing units are managed as manure by the New Hampshire Department of Agriculture. This regulatory determination was made by the 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.

The NHF&GD informs the Agency that they have received several inquiries from parties willing to take the settled solids. In general, the solids content of the vacuumed material is about five percent solids (remainder water) and those solids likely will be either land applied on local agricultural land or possibly used in a variety of greenhouse operations.

Water-Quality Based Limitations

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.

Available Dilution

Available dilution (also referred to as dilution factor) provided by the receiving water is determined using the hatchery's average daily discharge along with the stream's annual 7Q10 low flow of the receiving water (Patch Brook) just above the hatchery's most upstream 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 a stream's annual 7Q10 low flow just above the outfall is not available; therefore, other methods are utilized, such as determining an estimate of that value 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 ratio of stratified drift to total drainage area. For the Warren hatchery, the "Dingman Equation" regression equation was used by NHDES-WD to develop an estimated annual 7Q10 low flow value of 0.078 cubic feet per second (cfs) for Patch Brook just above the hatchery's most upstream outfall. See **Attachment D** for "Dingman Equation" including the various inputs for that equation's three variables. In addition, the permittee states in their current application that, "*Patch Brook would not flow in the summer if it were not for our discharge. It dries up above the facility.*" Observed periods of no discharge on a recurring annual basis usually result in a finding of essentially zero flow for the annual 7Q10 low flow value which is a result not significantly different from that predicted by the "Dingman Equation". These facts, coupled with the regular discharge of overflow water from up to 7 outfalls (001-003 and 005-008), all occurring within a short distance (2,400 feet) of each other, has lead the Agency to conclude that streamflow in Patch Brook opposite the hatchery provides no dilution for discharges for any of the hatchery's permitted outfalls.

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.

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. which is the pH range consistently applied in National (federal) 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

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-New 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 total residual chlorine (TRC) in the NH Standards. However, if a TRC limits were ever needed, each outfall would have a maximum daily limit of 19 micrograms per liter (μg/l) and an average monthly limit of 11 μg/l corresponding to the TRC acute and chronic aquatic-life criteria of 19 and 11 μg/l, respectively, in the NH Standards because each outfall has no available dilution with its respective 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 chl-*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 already see, hatchery discharges that 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 adopt either EPA's recommended nutrient criteria or its own version of them in their next revision of the NH Standards. The criteria for rivers and streams are found in EPA's ***Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion VIII***, **EPA, Office of Water, EPA 822-B-01-015, December 2001** and those for lakes and reservoirs are found in EPA's ***Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria for Lakes and Reservoirs in Nutrient Ecoregion VIII***, **EPA, Office of Water, EPA 822-B-00-010, December 2000**). These documents indicate that for subecoregion 58 (hatchery located within Ecoregion VIII, subecoregion 58) criteria values around 0.010 mg/l for total phosphorus (dissolved plus particulate) as P and 0.38 mg/l for total nitrogen (ammonia, organic, nitrate and nitrite) as N for rivers and streams; whereas, criteria values around 0.008 mg/l total phosphorus as P

and 0.24 mg/l for total nitrogen as N for lakes and reservoirs are all reasonable estimates for purposes of this discussion. When criteria are established in the NH Standards, the various hatchery's discharges will likely have to meet limits not significantly different from these criteria, given the low available dilution in the various receiving waters. In its guidance, EPA proposes to establish two "causal" parameters, those for nitrogen and phosphorus, and two "response" parameters, those for chl-*a* and a measure of water clarity - secchi disk for lakes and turbidity for other waterbodies such as rivers and streams.

Accordingly, for hatchery discharges to waterbodies not listed as impaired (in violation of NH Standards), the draft permit requires total nitrogen and total phosphorus monitorings to be performed quarterly along with the BOD_5 and TSS sampling to obtain data necessary to evaluate the impact of these pollutants on the quality of the receiving water. The Agency expects that the ban on direct discharge of cleaning waters coupled with efficient feed management and feeding strategies (fish food has a phosphorus content that varies from 1.0 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 dissolved oxygen in the effluent a special concern at Warren. These are the: (1) demonstrated need to aerate the source water to the hatchery's raceways; (2) effluent flows from the hatchery make up all the receiving stream's flow during the summer low-flow periods, meaning that low effluent dissolved-oxygen concentrations could exceed NH Standards for in-stream concentrations; (3) lack of reaeration potential in the stretch of receiving water adjacent to and just downstream of the hatchery, meaning that dissolved-oxygen concentrations in Patch Brook could be significantly affected by the discharges from the hatchery, particularly if oxygen demand from effluent BOD_5 or degradation of formalin is significant; and (4) and the oxidation of formalin in water (estimated half-life of 36 hours) consumes oxygen from the water column in the rearing and receiving waters.

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 all 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 the various receiving waters.

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. As an example of the formalin application rates for finfish to control external protozoa, such as the parasite Ichthyophthirius commonly referred to as ICH, FDA labeling instructions allow applications up to one hour a day with concentrations up to 170 mg/l for tanks and raceways at water temperatures above 50 degrees Fahrenheit and every other day indefinitely with concentrations that range from 15 to 25 mg/l for earthen ponds regardless of water temperature. Finfish eggs may be treated up to 15 minutes per day with concentrations not to exceed 2,000 mg/l. **Note: These application rates are only presented as examples and any drug application should always be made in accordance with the container's labeling instructions.** While the prophylactic use of formalin (i.e., drugs and chemicals used to prevent specific disease(s) in the absence of their symptoms) is not mentioned in those FDA regulations, EPA-New England will only allow its use under the extralabel or INAD provisions of the Federal Food, Drug and Cosmetic Act as a "best management practice" to control the excessive use of drugs.

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 (U.S. EPA'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. [Note: To express formaldehyde aquatic-life criteria as formalin criteria divide formaldehyde criteria by 0.37 for formalin contains 37 % formaldehyde.] Since the effluent will be analyzed for the formaldehyde portion of formalin, average monthly and maximum daily permit limits will be expressed as formaldehyde when formalin is administered to active rearing units for parasite control. 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. This means that the maximum daily and average monthly limits of 4.6 and 1.6 mg/l, respectively, rounded to the nearest tenth, apply to each outfall (001 through 008). These limits apply at all times, but the monitoring requirements in the draft permit are "when-in-use", since formalin's is used sparingly though out the year.

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. Any value 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).

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 4 later in this section, 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 4 for a comparison of sampling frequencies and sample types in the current versus new draft permits.

At the New Hampshire hatcheries, a "24-Hour Composite" sample type is required for effluents that discharge to receiving waters without passing through any type of settling (pond or device). However, given that this facility needs to: (1) possibly reroute cleaning water flows (pipe network); (2) purchase samplers (the facility has none); and (3) install those samplers where electric power is easily accessible so they can function properly in the harsh winter environment of north country, the Agency has decided to allow NHF&GD to collect "Grab" samples in lieu of "24-Hour Composite" samples up through November 30, 2007. This grace period will allow sufficient time to accomplish these tasks purchasing only those samplers actually needed to monitor the consolidated array.

The Warren hatchery has three distinct types of outfalls based on their period of discharge: continuous all year; continuous for known seasonal periods each year; and continuous for emergency situations called "periodic discharges" at least once during permit term. Specifically, Outfalls 003, 005 and 008 services raceways used to raise fish year round and they discharge continuously all year. Outfall 006 services several raceways in the Annex to Hatchery House, all of which are used to raise hatched eggs to fingerling-size fish, and it only discharges continuously for approximately 1 ½ months each year. Outfall 007 services egg hatching incubators and 2 raceways in the Hatchery House, and it only discharges continuously from around mid January through June each year. Outfalls 001 and 002 have been included to accommodate routine repairs or emergency situations where individual rectangular raceways located downstream of those outfalls must be removed from service for short time periods, and where it will not be feasible to by-pass culture water through or around those units to Outfall 003 during these periods. These later outfalls have been termed "periodic discharges". For all 7 outfalls, sampling frequency for the parameters BOD_5, TSS, Total Nitrogen and Total Phosphorus has been set a once per quarter, which is defined in the draft permit, "as a sample collected once during each calendar quarter ending March 31st, June 30th, September 30th and December 31st each year. A sample is required each calendar quarter that a discharge lasts longer than one day." This means that regardless of whether a discharge is continuous, seasonal or periodic, each calendar quarter that an outfall has a discharge lasting two or more days, a sample is required.

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 4. --*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
BOD_5 (M)	Not Required	Not Required	1/Quarter	24-Hour Composite or Grab
TSS (M)	Not Required	Not Required	1/Quarter	24-Hour Composite or Grab
Total Nitrogen (as N) (M)	Not Required	Not Required	1/Quarter	24-Hour Composite or Grab
Total Phosphorus (as P) (M)	Not Required	Not Required	1/Quarter	24-Hour Composite or Grab
Fish Biomass on Hand (M)	Not Required	Not Required, but permittee is 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	Not Required	Not Required	1/Week (Formalin	Grab

(M)			Present)	

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

Patch Brook is a tributary of the Baker River, which is a tributary of the Pemigewasset River which, in turn, is a tributary of the Merrimack River, and, as such, these streams 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". There is no stocking of Atlantic salmon in Patch Brook for the brook dries up above the hatchery just about every summer and below it, the brook only has a short run before emptying into Baker River. However, according to the NHF&GD, Baker River and its tributaries are heavily stocked each year with a Atlantic salmon sac fry. Specifically, 16.1 river miles along the Baker River's main stem plus 11 of its tributaries for a total of 37.2 river miles are stocked at a target level of around 140,500 sac fry. This stocking effort has been an ongoing activity of this Agency for many years.

EPA-New England's Opinion of Probable Impacts

Based on the permit limitations and requirements 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. This is particularly true given that the direct discharge of settled solids from active rearing units to receiving waters absent any form of off-line settling or equivalent solids removal has been prohibited and the discharge of Formalin is being regulated to assure that no toxics in toxic amounts are being released to any receiving water. If adverse effects do occur in the receiving water 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; 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 Part 124.53. Accordingly, the Agency 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.

Federal regulations require public notice be given of the preparation of a draft permit or its modification to allow opportunity for public comments and, if necessary, a public hearing. EPA-New England and the NHDES-WD intend to proceed with a limited distribution of a public notice of the proposed reissuance of an NPDES permit for the discharge of culture water from the Warren Fish Hatchery. Warren's existing as well as its proposed permit are considered a minor permit for NPDES classification purposes. EPA is not required to give notice in a daily or weekly newspaper of pending permit actions involving minor permits, provided the Agency notices those actions to a list of individuals who must receive public notices of pending permit actions that involve NPDES permits in that area or state [See 40 CFR Section 124.10(c)(2)(i)]. Therefore, no notice will appear in a local newspaper of the public-notice period.

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 of Municipal Permits Branch, U.S. Environmental Protection Agency, Office of Ecosystem Protection, One Congress Street, Suite 1100 (Mail Code: CMP), 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
Municipal Permits Branch
One Congress Street
Suite 1100, Mail Code: CMP
Boston, Massachusetts 02114-2023
Telephone No.: (617) 918-1297
FAX No.: (617) 918-0297

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Date:

Linda M. Murphy, Director
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

Generalized Schematic Diagram of Water Flow With All Rearing Units Fully Utilized

ATTACHMENT D

Dingman Equation

Regression equation number 12 found in ***Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont, Journal of the American Water Resources Association, Vol. 32, No. 2, April 1995*** by S. Lawrence Dingman & Stephen C. Lawlor is used to estimate the annual 7Q10 low flow of streams in New Hampshire. Equation 12 in the original journal article was corrected by S. Lawrence Dingman in a letter dated June 19, 2000, to Dr. Christopher Lant, Editor, Journal of the American Water Resources Association. The correction changed the minus to a plus sign in the equation just prior to the stratified drift (D) term. In this Fact Sheet, corrected equation 12 is hereafter referred to as the Dingman Equation.

The corrected equation for a stream's annual 7Q10 low flow is as follows:

$7Q10 = 10^x$ where $x = 1.25\log_{10}A + 0.0004Y + 1.49D - 2.22$

where:

7Q10 = Annual 7Q10 low flow, in cubic feet per second (cfs);
or 0.078 cfs just upstream of outfall 001

A = Drainage area, in square miles (mi^2); or 2.09 mi^2 just upstream of outfall 001

Y = Mean basin elevation, in feet (ft); or 1633.47 ft just upstream of outfall 001

D = Ratio of stratified drift area[1] to total drainage area, in decimal percent (%);
or 0.038 % just upstream of outfall 001

[1] Stratified drift areas taken from Ground-Water Availability Maps published at a scale of 1:125,000 by U.S. Geological Survey in 1975, 1976 and 1977 for New Hampshire.