STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

February 17, 2006

Mr. Jamie Bray
Palermo Rearing Station
200 Gore Road
Palermo, Maine 04354

RE: Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0001074
Maine Waste Discharge License (WDL) Application # W-002035-5Q-B-R
Final Permit/License

Dear Mr. Bray:

Enclosed please find a copy of your **final** MEPDES permit and Maine WDL which was approved by the Department of Environmental Protection. Please read the permit/license and its attached conditions carefully. You must follow the conditions in the order to satisfy the requirements of law. Any discharge not receiving adequate treatment is in violation of State Law and is subject to enforcement action.

Any interested person aggrieved by a Department determination made pursuant to applicable regulations, may appeal the decision following the procedures described in the attached DEP FACT SHEET entitled "*Appealing a Commissioner's Licensing Decision.*"

The Department would like to make you aware that your monthly Discharge Monitoring Report (DMR) forms may not reflect the revisions in this permitting action for several months after permit issuance, however, you are required to report applicable test results for parameters required by this permitting action that do not appear on the DMR. Please see the attached April 2003 O&M Newsletter article regarding this matter.

If you have any questions regarding the matter, please feel free to call me at (207) 287-6114 or contact me via email at Robert.D.Stratton@maine.gov.

Sincerely,

Robert D. Stratton
Division of Water Quality Management
Bureau of Land and Water Quality

Enc./cc: Steve Wilson, John Boland, Russ Danner, Peter Bourque (MDIFW),
Denise Behr (MEDEP); ~~Dave Webster~~ [redacted]; Jeff Murphy (NOAA Fisheries);
Wende Mahaney (USFWS) [redacted]

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AUGUSTA, MAINE 04333-0017
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DMR Lag

(reprinted from April 2003 O&M Newsletter)

When the Department renews discharge permits, the parameter limits may change or parameters may be added or deleted. In some cases, it is merely the replacement of the federally issued NPDES permit with a state-issued MEPDES permit that results in different limits. When the new permit is finalized, a copy of the permit is passed to our data entry staff for coding into EPA's Permits Compliance System (PCS) database. PCS was developed in the 1970's and is not user-friendly. Entering or changing parameters can take weeks or even months. This can create a lag between the time your new permit becomes effective and the new permit limits appearing on your DMRs. If you are faced with this, it can create three different situations that have to be dealt with in different ways.

1. If the parameter was included on previous DMRs, but only the limit was changed, there will be a space for the data. Please go ahead and enter it. When the changes are made to PCS, the program will have the data and compare it to the new limit.

2. When a parameter is eliminated from monitoring in your new permit, but there is a delay in changing the DMR, you will have a space on the DMR that needs to be filled. For a parameter that has been eliminated, please enter the space on the DMR for that parameter only with "NODI-9" (No Discharge Indicator Code #9). This code means monitoring is conditional or not required this monitoring period.

3. When your new permit includes parameters for which monitoring was not previously required, and coding has not caught up on the DMRs, there will not be any space on the DMR identified for those parameters. In that case, please fill out an extra sheet of paper with the facility name and permit number, along with all of the information normally required for each parameter (parameter code, data, frequency of analysis, sample type, and number of exceedances). Each data point should be identified as monthly average, weekly average, daily max, etc. and the units of measurement such as mg/L or lb/day. Staple the extra sheet to the DMR so that the extra data stays with the DMR form. Our data entry staff cannot enter the data for the new parameters until the PCS coding catches up. When the PCS coding does catch up, our data entry staff will have the data right at hand to do the entry without having to take the extra time to seek it from your inspector or from you.

   EPA is planning significant improvements for the PCS system that will be implemented in the next few years. These improvements should allow us to issue modified permits and DMRs concurrently. Until then we appreciate your assistance and patience in this effort.

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

ME. DEPT. INLAND FISHERIES & WILDLIFE	)	MAINE POLLUTANT DISCHARGE
PALERMO REARING STATION	)	ELIMINATION SYSTEM PERMIT
PALERMO, WALDO COUNTY, ME	)	AND
FISH HATCHERY	)	
#ME0001074	)	WASTE DISCHARGE LICENSE
#W-002035-5Q-B-R **APPROVAL**	)	**RENEWAL**

Pursuant to the provisions of the Federal Water Pollution Control Act, Title 33 USC, Section 1251, et. seq and Maine Law 38 M.R.S.A., Section 414-A et seq., and applicable regulations the Department of Environmental Protection (Department) has considered the application of the MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE PALERMO FISH REARING STATION (hereinafter MDIFW Palermo), with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

APPLICATION SUMMARY

The applicant has applied for a renewal of Waste Discharge License (WDL) #W-002035-5Q-A-R, which was issued on July 21, 2000, for a five-year term. The WDL approved the discharge of a maximum of 3.9 million gallons per day (MGD) of fish hatchery wastewater to the Sheepscot River, Class B from a state brook trout and brown trout rearing facility in Palermo, Maine. The applicant has applied for an increase in the effluent flow limit established in the previous licensing action.

PERMIT SUMMARY

January 12, 2001 – The Department received authorization from the U.S. Environmental Protection Agency (USEPA) to administer the National Pollutant Discharge Elimination System (NPDES) permit program in Maine, excluding areas of special interest to Maine Indian Tribes. On October 30, 2003, after consultation with the U.S. Department of Justice, USEPA extended Maine's NPDES program delegation to all but tribally owned lands. In those areas, the Department maintains the authority to issue WDLs pursuant to Maine law. The extent of Maine's delegated authority is under appeal at the time of this permitting action. From this point forward, the program will be referred to as the Maine Pollutant Discharge Elimination System (MEPDES) program and permit #ME0001074 will be utilized as the primary reference number for the Palermo facility.

This permitting action is similar to the July 21, 2000 WDL in that it is carrying forward:

1. the monthly average and daily maximum reporting requirements for mass of fish on hand; and
2. the pH limit range of 6.0-8.5 standard units.

This permitting action is different from the July 21, 2000 WDL in that it is:

1. eliminating the 3.9 MGD daily maximum discharge flow limit and establishing a 4.75 MGD monthly average flow limit;
2. establishing BOD and TSS monthly average and daily maximum concentration limits with a provision for the Department to establish new limits in the future based on technology performance analyses of the industry as a whole;
3. establishing BOD and TSS monthly average mass limits based on previous WDL requirements and daily maximum mass limits based on revised concentration and flow limits;
4. establishing a year-round annual total phosphorus mass limit based on the assimilative capacity of Long Pond and monthly phosphorus mass reporting requirements;
5. establishing a seasonal total phosphorus monthly average concentration limit based on the assimilative capacity of the Sheepscot River and a daily maximum phosphorus concentration reporting requirement;
6. establishing seasonal monthly average and daily maximum orthophosphate mass and concentration monitoring requirements during 2006;
7. converting previous mass limits and reporting requirements from pounds of pollutant per 100 pounds of fish on hand to pounds of pollutant per unit of time;
8. establishing a daily maximum mass limit for formalin based on Department best professional judgement (BPJ) and monthly average mass and concentration reporting requirements;
9. establishing a daily maximum concentration limit for formalin based on the previously established formaldehyde limit for three years followed by a revised concentration limit based on Department BPJ of formalin toxicity, to provide for infrastructure, operation, and maintenance upgrades as appropriate to insure compliance;
10. establishing a daily minimum effluent limit and monthly average and daily maximum monitoring requirements for effluent dissolved oxygen;
11. establishing minimum monitoring frequency and sample type requirements based on BPJ;
12. restricting approved outfalls to #005A for normal treated wastewater discharges and #006A for emergency bypass;
13. eliminating the reporting requirement for duration of discharge from the previous settling basin;
14. requiring a current facility Operation and Maintenance Plan;
15. establishing requirements for settling basin cleaning;
16. requiring compliance with existing state salmonid fish health rules;
17. requiring development and submittal of Biosecurity and Disease Contingency Plans;
18. establishing requirements related to proper use and record keeping of therapeutic agents;
19. eliminating effluent limits for chlorine and establishing record keeping requirements for disinfecting/sanitizing agents;
20. establishing BPJ derived minimum treatment technology requirements for the Palermo facility;
21. establishing requirements for annual ambient macroinvertebrate biomonitoring beginning in 2007;
22. replacing previous receiving water study requirements with requirements for ambient dissolved oxygen and temperature monitoring studies; and
23. requiring a fish Containment Management System with provisions for auditing and reporting.

CONCLUSIONS

BASED on the findings in the attached Fact Sheet dated December 13, 2005 and revised February 9, 2006, and subject to the Conditions listed below, the Department makes the following conclusions:

1. The discharge, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification.

2. The discharge, either by itself or in combination with other discharges, will not lower the quality of any unclassified body of water below the classification which the Department expects to adopt in accordance with state law.

3. The provisions of the State's antidegradation policy, 38 MRSA Section 464(4)(F), will be met, in that:

   (a) Existing in-stream water uses and the level of water quality necessary to protect and maintain those existing uses will be maintained and protected;

   (b) Where high quality waters of the State constitute an outstanding national resource, that water quality will be maintained and protected;

   (c) The standards of classification of the receiving water body are met or, where the standards of classification of the receiving water body are not met, the discharge will not cause or contribute to the failure of the water body to meet the standards of classification;

   (d) Where the actual quality of any classified receiving water body exceeds the minimum standards of the next highest classification, that higher water quality will be maintained and protected; and

   (e) Where a discharge will result in lowering the existing quality of any water body, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State.

4. The discharge will be subject to effluent limitations that require application of best practicable treatment.

ACTION

THEREFORE, the Department APPROVES the above noted application of the MDIFW PALERMO FISH REARING STATION to discharge fish hatchery wastewater consisting of a monthly average flow of 4.75 MGD to the Sheepscot River, Class B, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations including:

1. "Maine Pollutant Discharge Elimination System Permit Standard Conditions Applicable To All Permits," revised July 1, 2002, copy attached.

2. The attached Special Conditions, including any effluent limitations and monitoring requirements.

3. This permit expires five (5) years from the date of signature below.

DONE AND DATED AT AUGUSTA, MAINE, THIS 20th DAY OF February, 2006.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____ for
David P. Littell, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 5, 2005
Date of application acceptance: July 7, 2005

FILED
FEB 21 2006
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

Date filed with Board of Environmental Protection _____.

This Order prepared by Robert D. Stratton, BUREAU OF LAND & WATER QUALITY
W-002035-5Q-B-R / #ME0001074 February 17, 2006

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date of this permit and lasting through permit expiration, the permittee is authorized to discharge **fish hatchery wastewater from Outfall #005A** to the Sheepscot River. Such discharges shall be limited and monitored by the permittee as specified below[1]:

Monitoring Parameter	Discharge Limitations and Reporting Requirements				Minimum Monitoring Requirements		
	Monthly Average as specified	Daily Maximum as specified	Monthly Average as specified	Daily Maximum as specified	Daily Minimum as specified	Measurement Frequency as specified	Sample Type as specified
Flow *[50050]*	4.75 MGD *[03]*	---	---	---	---	Daily *[01/01]*	Measured *[MS]*
BOD[2] *[00310]*	65 lbs/day *[26]*	396 lbs/day *[26]*	6 mg/L *[19]*	10 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
TSS[2] *[00530]*	65 lbs/day *[26]*	396 lbs/day *[26]*	6 mg/L *[19]*	10 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
Total Phosphorus[4] *[00665]*	Report total lbs/month *[76]*	Maximum 197 lbs/year *[50]*	0.035 mg/L *[19]*	report mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
Orthophosphate (as P)[4] **June 1 - Sept 30, 2006** *[04175]*	report lbs/day *[26]*	report lbs/day *[26]*	report mg/L *[19]*	report mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
Fish on Hand *[45604]*	report lbs/day *[26]*	report lbs/day *[26]*	---	---	---	Once/2 weeks *[01/14]*	Calculated *[CA]*
Formalin[5] **Effective until Dec 31, 2008** *[51064]*	report lbs/day *[26]*	41 lbs/day *[26]*	report mg/L *[19]*	13.5 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Calculated *[CA]*
Formalin[5] **Beginning Jan 1, 2009** *[51064]*	report lbs/day *[26]*	41 lbs/day *[26]*	report mg/L *[19]*	1.6 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Calculated *[CA]*
Dissolved Oxygen[6] **From June 1 – Sept 30 yearly** *[00300]*	---	---	report mg/L *[19]*	report mg/L *[19]*	7.5 mg/L *[19]*	1/week *[01/07]*	Measured *[MS]*
pH *[00400]*	---	---	---	6.0-8.5 S.U. *[12]*	---	Once/2 weeks *[01/14]*	Grab *[GR]*

The italicized numeric values bracketed in the table above and in subsequent text are code numbers that Department personnel utilize to code the monthly Discharge Monitoring Reports (DMRs). Footnotes are found on Pages 8 and 9.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning the effective date of this permit and lasting through permit expiration, the permittee is authorized to discharge **fish hatchery wastewater from Outfall #006A (emergency bypass)** to the Sheepscot River. Such discharges shall be limited and monitored by the permittee as specified below[1]:

Monitoring Parameter	Discharge Limitations and Reporting Requirements				Minimum Monitoring Requirements		
	Monthly Average as specified	Daily Maximum as specified	Monthly Average as specified	Daily Maximum as specified	Daily Minimum as specified	Measurement Frequency as specified	Sample Type as specified
Flow *[50050]*	4.75 MGD *[03]*	---	---	---	---	Daily *[01/01]*	Measured *[MS]*
BOD[2] *[00310]*	65 lbs/day *[26]*	396 lbs/day *[26]*	6 mg/L *[19]*	10 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
TSS[2] *[00530]*	65 lbs/day *[26]*	396 lbs/day *[26]*	6 mg/L *[19]*	10 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
Total Phosphorus[4] *[00665]*	Report total lbs/month *[76]*	Maximum 197 lbs/year *[50]*	0.035 mg/L *[19]*	report mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
Orthophosphate (as P)[4] **June 1 - Sept 30, 2006** *[04175]*	report lbs/day *[26]*	report lbs/day *[26]*	report mg/L *[19]*	report mg/L *[19]*	---	Once/2 weeks *[01/14]*	Composite[3] *[CP]*
Fish on Hand *[45604]*	report lbs/day *[26]*	report lbs/day *[26]*	---	---	---	Once/2 weeks *[01/14]*	Calculated *[CA]*
Formalin[5] **Effective until Dec 31, 2008** *[51064]*	report lbs/day *[26]*	41 lbs/day *[26]*	report mg/L *[19]*	13.5 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Calculated *[CA]*
Formalin[5] **Beginning Jan 1, 2009** *[51064]*	report lbs/day *[26]*	41 lbs/day *[26]*	report mg/L *[19]*	1.6 mg/L *[19]*	---	Once/2 weeks *[01/14]*	Calculated *[CA]*
Dissolved Oxygen[6] **From June 1 – Sept 30 yearly** *[00300]*	---	---	report mg/L *[19]*	report mg/L *[19]*	7.5 mg/L *[19]*	1/week *[01/07]*	Measured *[MS]*
pH *[00400]*	---	---	---	6.0-8.5 S.U. *[12]*	---	Once/2 weeks *[01/14]*	Grab *[GR]*

The italicized numeric values bracketed in the table above and in subsequent text are code numbers that Department personnel utilize to code the monthly DMRs. Footnotes are found on Pages 8 and 9.

SPECIAL CONDITIONS
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning the effective date of this permit and lasting through permit expiration, the permittee is authorized to discharge **fish hatchery wastewater from Outfall #005A and Outfall #006A (emergency bypass)** to the Sheepscot River. Such discharges shall be limited and monitored by the permittee as specified below **from June 1 through September 30 each year**:

Monitoring Parameter	**Discharge Limitations and Reporting Requirements**					**Minimum Monitoring Requirements**	
	Monthly Average as specified	Daily Maximum as specified	Monthly Average as specified	Daily Maximum as specified	Daily Minimum as specified	Measurement Frequency as specified	Sample Type as specified
Dissolved Oxygen[6] **Ambient Location 1:** Between Sheepscot Lake dam and head of MDIFW Palermo facility. *[00300]*	---	---	Report mg/L *[19]*	Report mg/L *[19]*	Report mg/L *[19]*	1/week *[01/07]*	Measured *[MS]*
Water Temperature[6] Ambient Location 1 *[00010]*	---	---	Report Degrees Celsius *[04]*	Report Degrees Celsius *[04]*	Report Degrees Celsius *[04]*	1/week *[01/07]*	Measured *[MS]*
Time of Day[6,7] Ambient Location 1 *[80273]*	---	---	---	Report 24-hour time *[1Q]*	---	1/week *[01/07]*	Measured *[MS]*
Dissolved Oxygen[6] **Ambient Location 2:** Below MDIFW Palermo outfalls. *[00300]*	---	---	Report mg/L *[19]*	Report mg/L *[19]*	Report mg/L *[19]*	1/week *[01/07]*	Measured *[MS]*
Water Temperature[6] Ambient Location 2 *[00010]*	---	---	Report Degrees Celsius *[04]*	Report Degrees Celsius *[04]*	Report Degrees Celsius *[04]*	1/week *[01/07]*	Measured *[MS]*
Time of Day[6,7] Ambient Location 2 *[80273]*	---	---	---	Report 24-hour time *[1Q]*	---	1/week *[01/07]*	Measured *[MS]*

The italicized numeric values bracketed in the table above and in subsequent text are code numbers that Department personnel utilize to code the monthly DMRs. Footnotes are found on Pages 8 and 9.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS, FOOTNOTES:

All sampling and analysis must be conducted in accordance with: (a) methods approved by 40 Code of Federal Regulations (CFR) Part 136, (b) alternative methods approved by the Department in accordance with the procedures in 40 CFR Part 136, or (c) as otherwise specified by the Department. Samples that are sent out for analysis shall be analyzed by a laboratory certified by the State of Maine's Department of Health and Human Services unless otherwise approved by the Department. **All effluent limits are gross, end of pipe limits, unless otherwise specified.**

1. Effluent Monitoring: Effluent values shall be determined through sampling at Outfall #005A following all means of wastewater treatment or at Outfall #006A, the facility emergency facility outfall, as shown on Fact Sheet Attachment B. All monitoring shall be conducted so as to capture conditions representative of wastewater generating processes at the facility, such as flow-through and cleaning discharge flows, use of therapeutic and disinfecting/sanitizing agents, etc. and in consideration of settling pond/basin detention times. Any change in sampling location must be approved by the Department in writing.

2. BOD and TSS: BOD and TSS effluent concentration limits are based on results of secondary level fish hatchery wastewater treatment, developed by EPA. It is the Department's intent to re-evaluate and potentially revise concentration limits in the future based on statistical evaluations of demonstrated performance of consistently and properly utilized treatment technology for the industry.

3. Composite Samples: Samples shall consist of 24-hour composites collected with an automatic composite sampler. Alternatively, when weather conditions and/or equipment prevents automatic compositing and upon Department approval, the permittee may manually composite a minimum of four grab samples collected at two-hour intervals during the working day at the facility.

4. Total Phosphorus and Orthophosphate: The concentration and mass effluent limits and monitoring requirements shall consist of gross, end-of-pipe values. **Phosphorus concentration** limits and monitoring requirements (mg/L) are seasonal and are only in effect from June 1 through September 30 each year. **Orthophosphate** monitoring requirements are only in effect from June 1 through September 30, 2006. **Phosphorus** mass limits and monitoring requirements (lbs) are in effect year-round. **The permittee is cautioned that compliance with concentration limits will not necessarily result in compliance with mass limits.** Laboratory analysis shall be conducted on the same sample and shall consist of a low-level phosphorus analysis with a minimum detection limit of 1 part per billion (1 ug/L).

5. Formalin: Formalin monitoring shall be conducted only when in use at the facility and shall consist of a calculated effluent value. The permittee shall calculate the effluent formalin concentration through accurate determinations of the formalin concentration administered in each facility use, the volume of water to which the formalin is added, and dilutions provided from administration to end-of-pipe. The effluent mass shall be calculated by multiplying the gallons of formalin used by a 9.13 lbs / gallon conversion formula based on the specific gravity of formalin. The permittee shall provide this information and calculations to the Department in a document accompanying the monthly DMR. See Fact Sheet Section 17 for sample calculations.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS, FOOTNOTES (cont'd)

6. Supplemental Data Forms: In addition to specified DMR reporting requirements, the permittee shall submit all data from effluent dissolved oxygen, ambient dissolved oxygen, water temperature, and time of day monitoring to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report pursuant to Permit Special Conditions E and N.

7. Time of Day: Time of day of ambient dissolved oxygen and temperature monitoring shall be reported using 24-hour time as HH hours, MM minutes, such as 05 hours 10 minutes.

B. NARRATIVE EFFLUENT LIMITATIONS:

1. The effluent shall not contain a visible oil sheen, foam or floating solids at any time which would impair the usages designated by the classification of the receiving waters.

2. The effluent shall not contain materials in concentrations or combinations which are hazardous or toxic to aquatic life, or which would impair the usages designated by the classification of the receiving waters.

3. The discharges shall not cause visible discoloration or turbidity in the receiving waters which would impair the usages designated by the classification of the receiving waters.

4. Notwithstanding specific conditions of this permit the effluent must not lower the quality of any classified body of water below such classification, or lower the existing quality of any body of water if the existing quality is higher than the classification.

C. UNAUTHORIZED DISCHARGES:

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from Outfall #005A or Outfall #006A, the facility emergency outfall, as shown on Fact Sheet Attachment B. Discharges of wastewater from any other point source are not authorized under this permit, and shall be reported in accordance with Standard Condition B(5) (*Bypass*) of this permit.

D. NOTIFICATION REQUIREMENT:

In accordance with Standard Condition D, the permittee shall notify the Department of the following:

1. Any substantial change in the volume or character of pollutants being introduced into the wastewater collection and treatment system.

SPECIAL CONDITIONS
D. NOTIFICATION REQUIREMENT (cont'd):

2. For the purposes of this section, adequate notice shall include information on:

   a. The quality or quantity of wastewater introduced to the waste water collection and treatment system; and

   b. Any anticipated impact of the change in the quantity or quality of the wastewater to be discharged from the treatment system.

E. MONITORING AND REPORTING:

Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report (DMR) forms provided by the Department and postmarked on or before the thirteenth (13th) day of the month or hand-delivered to a Department regional office such that the DMR's are received by the Department on or before the fifteenth (15th) day of the month following the completed reporting period. A signed copy of the DMR and all other reports required herein including reports required pursuant to Permit Special Conditions A (footnote 6), F, G, M, N and O, shall be submitted to the Department's assigned compliance inspector at the following address:

Department of Environmental Protection
Bureau of Land and Water Quality
Division of Water Quality Management
17 State House Station
Augusta, Maine 04333-0017

F. OPERATION & MAINTENANCE (O&M) PLAN:

On or before July 1, 2006, the permittee shall submit to the Department a current written comprehensive Operation & Maintenance (O&M) Plan ***[09699]***. The plan shall provide a systematic approach by which the permittee shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit.

The O&M Plan shall establish Best Management Practices (BMP) to be followed in operating the facility, cleaning the raceways/culture tanks, screens, and other equipment and disposing of any solid waste. The purpose of the BMP portion of the plan is to identify and to describe the practices which minimize the amounts of pollutants (biological, chemical, and medicinal) discharged to surface waters. Among other items, the plan shall describe in detail efficient feed management and feeding strategies to minimize discharges of uneaten feed and waste products, how and when the accumulated solids are to be removed, dewatered, and methods of disposal. The plan shall also describe where the removed material is to be placed and the techniques used to prevent it from re-entering the surface waters from any onsite storage. The plan shall document the recipients and methods of any offsite waste disposal.

SPECIAL CONDITIONS

F. OPERATION & MAINTENANCE (O&M) PLAN (cont'd):

By December 31 of each year, or within 90 days of any process changes or minor equipment upgrades, the permittee shall evaluate and modify the O&M Plan including site plan(s) and schematic(s) for the wastewater treatment facility to ensure that it is up-to-date. The O&M Plan shall be kept on-site at all times and made available to Department and EPA personnel upon request.

Within 90 days of completion of new and or substantial upgrades of the wastewater treatment facility, the permittee shall submit the updated O&M Plan to their Department inspector for review and comment.

G. SCHEDULE OF COMPLIANCE

The Department is establishing a Schedule of Compliance for implementation of the following effluent limits and requirements established in this permitting action to provide for infrastructure, operation and maintenance upgrades as appropriate to insure compliance. The permittee has recently completed major renovations to MDIFW Palermo designed to improve both fish production and effluent quality and has requested a minimum of three years for implementation of more restrictive toxicity based effluent limits. MDIFW proposes to use this time to conduct a comprehensive evaluation of the structural and operational effectiveness of its wastewater discharge treatment system and to conduct toxicity testing of formalin and potential alternative therapeutics. The permittee shall adhere to the specific required tasks and deadlines detailed below:

1. **Technology and Water Quality Based Effluent Limitations:** The permittee shall ensure that the facility provides wastewater treatment equal to or better than the minimum treatment technology for all wastewater discharges and complies with all technology based effluent limitations, monitoring requirements, and operational requirements established in this permitting action **upon its effective date** and shall ensure that the facility complies with all new toxicity based limits (formalin) **on or before January 1, 2009**.

2. **Formalin:**

A. **On or before January 1, 2007**, the permittee shall submit to the Department for review and comment, facility wide plans (reports) to address operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit *[34099]*. The plans shall encompass methods, technologies, and implementation schedules for attainment of the formalin limits. For any alternatives involving design and construction, see Fact Sheet Attachment C for Department guidance on developing an Engineer's Facilities Planning Report.

SPECIAL CONDITIONS
G. SCHEDULE OF COMPLIANCE (cont'd)

B. **On or before June 1, 2007**, the permittee shall provide the Department with results of pilot testing and site investigations for the operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit. ***[63899]***

C. **On or before January 1, 2008**, the permittee shall complete the design for any physical structure, equipment, and/or operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit, obtain all permits or licenses necessary for construction, and provide the Department with a report of the results ***[54299]***.

D. **On or before November 1, 2008**, the permittee shall complete construction and initiate startup of the operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit ***[91899]***.

E. **On or before January 1, 2009,** the operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit shall be fully operational and the revised formalin limits shall be in effect ***[52599]***.

H. SETTLING BASIN CLEANING:

All wastewater settling structures shall be cleaned when accumulated materials occupy 20% of a basin's capacity, when material deposition in any area of the basins exceeds 50% of the operational depth, or at any time that solids from the basins are contributing to a violation of permit effluent limits. The permittee is responsible for reporting effluent violations pursuant to Standard Conditions D.1 (f) and (g).

I. DISEASE AND PATHOGEN CONTROL AND REPORTING:

MDIFW Palermo Hatchery must comply with Maine Department of Inland Fisheries and Wildlife and Maine Department of Marine Resources salmonid fish health rules (12 MRSA, §6071; 12 MRSA, §§7011, 7035, 7201, and 7202, or revised rules). The cited rules include requirements for notification to the appropriate agency within 24-hours of pathogen detection. In the event of a catastrophic pathogen occurrence, the permittee shall submit to the Department for review, information on the proposed treatment including materials/chemicals to be used, material/chemical toxicity to aquatic life, the mass and concentrations of materials/chemicals as administered, and the concentrations to be expected in the effluent. The Department will address such occurrences through administrative modifications of the permit.

Based on concerns of the potential for disease transmission from the MDIFW Palermo facility to the Sheepscot River and impacts to Atlantic salmon contained therein outlined in Fact Sheet Sections 10 and 21, this permitting action requires:

SPECIAL CONDITIONS

I. DISEASE AND PATHOGEN CONTROL AND REPORTING (cont'd)

On or before June 1, 2006, the permittee shall submit to the Department for review and approval, a scope of work for development of Biosecurity and Disease Contingency Plans. *[53999]* The scope of work shall generally identify rules/requirements, operational practices and procedures to be identified and/or developed to insure the significant reduction in, or elimination of, the threat of disease transmission from MDIFW Palermo to the Sheepscot River. The scope of work shall, at a minimum, identify opportunities for disease transmission and introductions of new pathogens, identify and provide for closure of any gaps left by the "Maine Fish Health Rules" especially related to initial steps for managing outbreaks of diseases of concern, address practices for handling affected fish, and methods for the isolation, containment, and treatment of contaminated water prior to its disposal or discharge to the receiving water.

On or before March 1, 2007, the permittee shall submit to the Department for review and approval, a final Biosecurity and Disease Contingency Plan that addresses items/issues contained in the Department approved Scope of Work and insures the significant reduction in, or elimination of, the threat of disease transmission from MDIFW Palermo to the Sheepscot River. *[01299]* MDIFW is encouraged to consult with USFWS and NOAA Fisheries as it plans for and develops the Biosecurity and Disease Contingency Plans.

J. THERAPEUTIC AGENTS:

All medicated fish feeds, drugs, and other fish health therapeutants shall be registered with USEPA as appropriate, approved by the US Food and Drug Administration (USFDA), and applied according to USFDA accepted guidelines and manufacturer's label instructions. Records of all such materials used are to be maintained at the facility for a period of five years. This permitting action does not authorize routine off-label or extra-label drug use. Such uses shall only be permitted in emergency situations when they are the only feasible treatments available and only under the authority of a veterinarian. **The permittee shall notify the Department in writing within 24-hours of such use.** This notification must be provided by the veterinarian involved and must include the agent(s) used, the concentration and mass applied, a description of how the use constitutes off-label or extra-label use, the necessity for the use in terms of the condition to be treated and the inability to utilize accepted drugs or approved methods, the duration of the use, the likely need of repeat treatments, and information on aquatic toxicity. If, upon review of information regarding the use of a drug pursuant to this section, the Department determines that significant adverse effects are likely to occur, it may restrict or limit such use.

K. DISINFECTING/SANITIZING AGENTS:

Records of all disinfectants and/or sanitizing agents used that have the potential to enter the waste stream or receiving water, their volumes and concentrations as used and concentrations at the point of discharge, shall be maintained at the facility for a period of five years. This permitting action only authorizes the discharge of those materials applied for, evaluated by the Department, and either regulated or determined to be deminimus in this permitting action or in subsequent Department actions.

SPECIAL CONDITIONS

L. MINIMUM TREATMENT TECHNOLOGY REQUIREMENT:

Between 2000 and 2002, eleven Maine fish hatcheries were evaluated to identify potential options for facility upgrades. All nine Maine Department of Inland Fisheries and Wildlife hatcheries were evaluated by FishPro Inc., while the two USFWS hatcheries were evaluated by the Freshwater Institute. Recommended wastewater treatment upgrades for each of the facilities included microscreen filtration of the effluent. Based on the information provided and Department BPJ, the Department is specifying that minimum treatment technology for the Palermo facility shall consist of treatment equal to or better than 60-micron microscreen filtration of the effluent, wastewater settling/clarification, removal of solids. MDIFW Palermo shall provide treatment equal to or better than the BPJ minimum treatment technology and shall comply with all effluent limitations, monitoring requirements, and operational requirements established in this permitting action. Additional treatment may be necessary to achieve specific water quality based limitations.

M. AMBIENT MACROINVERTEBRATE BIOMONITORING:

Based on available data, the Department is concerned with the effects of fish hatchery effluent discharges on rivers and streams in Maine and specifically the Sheepscot River. As macroinvertebrate communities provide indications of the overall ecological health of a receiving water, the Department has determined that biomonitoring is needed to better evaluate attainment of river and stream water classification standards and designated uses, resource impacts, and corrective measures when necessary. In order to address this need, the Department's Division of Environmental Assessment (MEDEP DEA) will conduct macroinvertebrate biomonitoring in the receiving water in 2006 to determine attainment of the aquatic life standards following upgrade of the MDIFW Palermo facility. This permitting action requires MDIFW Palermo to conduct ambient macroinvertebrate biomonitoring **annually beginning calendar year 2007. On or before March 1, 2007**, MDIFW Palermo shall submit a biomonitoring plan for the Sheepscot River to MEDEP DEA for review and approval ***[34099]***. The plan shall be consistent with "*Methods for Biological Sampling and Analysis of Maine's Rivers and Streams*" (DEP #LW0387-B2002, August 2002) and shall include a scope of work and schedule, monitoring locations and maps, methods and materials, and reporting procedures for the biomonitoring program. Biomonitoring shall be conducted according to a Department approved monitoring plan. Results shall be reported to the Department in a biomonitoring report by December 15 each year ***[90199, 90299, 90399, 90499]***.

If the receiving water is determined by the Department to be meeting criteria, standards, and designated uses for its assigned water quality class, including following the 2006 monitoring, the Department will reopen the permit pursuant to Permit Special Condition P, to modify or discontinue the biomonitoring requirement.

SPECIAL CONDITIONS

N. AMBIENT DISSOLVED OXYGEN AND TEMPERATURE MONITORING:

Based on the low effluent dilution provided in the receiving water and the need for additional data on the effects of the MDIFW Palermo hatchery's effluent on the water quality of its receiving water, this permitting action requires the permittee to seasonally monitor ambient dissolved oxygen and temperature levels in the Sheepscot River. The permittee shall monitor ambient dissolved oxygen and temperature (Celsius) from June 1 through September 30 each year beginning the effective date of this permit at a frequency of once per week and shall report the time of day the monitoring is conducted. The permittee shall report all monitoring results to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report *[21899]*. Monitoring shall be conducted within two hours of sunrise, or as indicated in a Department approved monitoring plan, at two locations: (1) between the Sheepscot Lake dam and the head of the MDIFW Palermo facility in an area representing free-flowing conditions and (2) below the MDIFW Palermo outfalls in an area representing the dissolved oxygen sag point, unless revised by the Department. The permittee shall also report on the composition of river flow between the dam and the head of the facility. The permittee shall specify if river flow results from flow over the dam and provide the estimated depth of that overflow, or only leakage through the dam and provide the length of time that condition persists in days. **On or before three months following the effective date of this permit**, MDIFW Palermo shall submit a plan for ambient dissolved oxygen and temperature monitoring and instrument calibration/data quality control to the Department's Division of Environmental Assessment for review and approval ***[00201]***. The plan shall include a scope of work and schedule, monitoring locations and maps, sampling methods and materials, and reporting procedures for the ambient dissolved oxygen and temperature monitoring program. The plan shall also include procedures for regular instrument calibration to ensure data quality control. Ambient dissolved oxygen and temperature monitoring shall be conducted according to a Department approved monitoring plan.

O. SALMON GENETIC INTEGRITY AND HATCHERY ESCAPE PREVENTION:

The US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) formally listed the Atlantic salmon as an endangered species on November 17, 2000. Two significant issues of concern regarding the rearing of salmon in Maine involve the genetic integrity of the salmon and escape prevention to avoid impacts on native fish. Leading up to the listing and in subsequent draft MEPDES Permit / Maine WDL reviews, the USFWS and NOAA Fisheries have advocated for genetic testing of Atlantic salmon housed at hatchery and rearing facilities to ensure that they are of North American origin, as well as employment of a fully functional Containment Management System (CMS) at facilities to prevent the escape of raised salmon or other species of concern in order to avoid impacts on native fish populations. As described in Section 16 of the attached Fact Sheet, these issues are of particular concern for the Gulf of Maine Distinct Population Segment of Atlantic salmon (DPS). MDIFW Palermo discharges its effluent to the Sheepscot River, which is within the Gulf of Maine DPS and is one of eight rivers known to contain endangered Atlantic salmon.

SPECIAL CONDITIONS
O. SALMON GENETIC INTEGRITY AND HATCHERY ESCAPE PREVENTION (cont'd)

MDIFW Palermo is a state brook trout and brown trout rearing facility that produces fish for stocking in Maine waters as part of MDIFW's responsibilities in managing fisheries. MDIFW Palermo does not raise salmon and thus is not subject to genetic testing requirements. However, despite an active brown trout fishery and former stocking program in this water, the rearing of Brown trout in the Sheepscot River is of concern to USFWS and NOAA Fisheries.

The USFWS reports, "*The escape of brown trout into the Sheepscot River is a very serious threat to native Atlantic salmon populations and would result in a take of salmon, which is illegal under the federal Endangered Species Act. The draft Recovery Plan for Atlantic Salmon identified the introduction of non-native fish species, including brown trout, as a high level threat to salmon and a highest priority for action to address the threat.*" NOAA Fisheries reports, "*Brown trout are known to impact Atlantic salmon through several mechanisms including:* (1) *Predation - Brown trout predation has been implicated in the decline of several native salmonid populations in North America. In Maine, brown trout have been documented consuming large numbers of stocked Atlantic salmon fry.* (2) *Competition for habitat - Most evidence suggests that brown trout will displace or otherwise outcompete Atlantic salmon from pool habitats in both summer and winter.* (3) *Redd superimposition - Brown trout and Atlantic salmon demonstrate similar spawning site preferences and spawn at about the same time in the fall. Evidence also suggests that brown trout females may prefer to spawn on existing redd sites.* (4) *Competition for food - It is expected that juvenile salmon and trout would compete for similar food items in the river.* (5) *Genetic impacts - Brown trout are capable of hybridizing with other salmonids. Studies in Sweden have documented brown trout/Atlantic salmon hybrids. Hybridization was also documented in the Connecticut River.*"

MDIFW Palermo reports that the upgraded facility employs effluent screens at the ends of both lines of raceways, which serve to block fish from entering both the facility wastewater treatment infrastructure and the emergency outfall (Outfall #006A). Further, the facility drum filter and associated wing walls provide fish escape prevention. All screens are sized according to the size of the fish and are inspected regularly. Any escapees would have to elude these measures to enter the receiving water.

Based on requirements established in Maine's Aquaculture General Permit (#MEG130000, Part II, Section I), individual MEPDES Permits for marine aquaculture facilities, and guidance developed by the Maine Aquaculture Association, in this permitting action, the Department requires that **the permittee shall employ a fully functional Containment Management System (CMS) at the facility** designed, constructed, and operated so as to prevent the accidental or consequential escape of fish to open water. The CMS plan shall include a site plan or schematic with specifications of the particular system. The permittee shall develop and utilize a CMS consisting of management and auditing methods to describe or address the following: site plan description, inventory control procedures, predator control procedures, escape response procedures, unusual event management, severe weather procedures and training. The CMS shall contain a facility specific list of critical control points (CCP) where escapes have been determined to potentially occur. Each CCP must address the following: the specific location, control mechanisms, critical limits, monitoring

SPECIAL CONDITIONS
O. SALMON GENETIC INTEGRITY AND HATCHERY ESCAPE PREVENTION (cont'd)

procedures, appropriate corrective actions, verification procedures that define adequate CCP monitoring, and a defined record keeping system. The permittee shall submit the CMS plan to the Department for review and approval **on or before six months following the effective date of this permit.** *[53799]*

The CMS site specific plan shall describe the use of effective containment barriers appropriate to the life history of the fish. The facility shall have in place both a three-barrier system for fish up to 5 grams in size and a two barrier system for fish 5 grams in size or larger. The three-barrier system shall include one barrier at the incubation/rearing unit, one barrier at the effluent from the hatch house/fry rearing area and a third barrier placed inline with the entire effluent from the facility. Each barrier shall be appropriate to the size of fish being contained. The two-barrier system shall include one barrier at the individual rearing unit drain and one barrier inline with the total effluent from the facility. Each barrier shall be appropriate to the size of fish being contained. Barriers installed in the system may be of the screen type or some other similarly effective device used to contain fish of a specific size in a designated area. Barriers installed in the system for compliance with these requirements shall be monitored daily. Additional requirements include:

1. The CMS shall be audited **at least once per year and within 30 days of a reportable escape** (more than 50 fish) by a party other than the facility operator or owner qualified to conduct such audits and approved by the Department. *[63899]* A written report of these audits shall be provided to the facility and the Department for review and approval **within 30 days of the audit being conducted** *[43699]*. If deficiencies are identified during the audit, the report shall contain a corrective action plan, including a timetable for implementation and re-auditing to verify deficiencies are addressed. Additional third party audits to verify correction of deficiencies shall be conducted in accordance with the corrective action plan or upon request of the Department. The facility shall notify the Department upon completion of corrective actions.

2. Facility personnel responsible for routine operation shall be properly trained and qualified to implement the CMS. **Prior to any containment system assessment** associated with this permit, the permittee shall provide to the Department documentation of the employee's or contractor's demonstrated capabilities to conduct such work. *[21599]*

3. The permittee shall maintain complete records, logs, reports of internal and third party audits and documents related to the CMS on site for a period of 5 years.

4. For new facilities, a CMS shall be prepared and submitted to the Department for review and approval prior to fish being introduced into the facility.

The facility shall report any known or suspected escapes of more than 50 fish within 24 hours to the Maine Atlantic Salmon Commission at 207-287-9973 or 287-9972 (Pat Keliher), Maine Department of Inland Fisheries and Wildlife at 207-287-5202 (Commissioner's office), USFWS Maine Field Office at 207-827-5938, and NOAA Fisheries Maine Office at 207-866-7379.

SPECIAL CONDITIONS

P. REOPENING OF PERMIT FOR MODIFICATIONS

Upon evaluation of the tests results or monitoring requirements specified in Special Conditions of this permitting action, new site specific information, new water quality monitoring data or modeling information, or any other pertinent test results or information obtained during the term of this permit, the Department may, at anytime and with notice to the permittee, modify this permit to; 1) include effluent limits necessary to control specific pollutants or whole effluent toxicity where there is a reasonable potential that the effluent may cause water quality criteria to be exceeded, (2) require additional monitoring if results on file are inconclusive; or (3) change monitoring requirements or limitations based on new information.

Q. SEVERABILITY

In the event that any provision, or part thereof, of this permit is declared to be unlawful by a reviewing court, the remainder of the permit shall remain in full force and effect, and shall be construed and enforced in all respects as if such unlawful provision, or part thereof, had been omitted, unless otherwise ordered by the court.

MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
AND
MAINE WASTE DISCHARGE LICENSE

FACT SHEET

Date: December 13, 2005
Revised: February 9, 2006

MEPDES PERMIT NUMBER: # ME0001074
WASTE DISCHARGE LICENSE: # W-002035-5Q-B-R

NAME AND ADDRESS OF APPLICANT:

PALERMO REARING STATION
Maine Dept. of Inland Fisheries and Wildlife
284 State Street, 41 State House Station
Augusta, Maine 04333

COUNTY: WALDO

NAME AND ADDRESS WHERE DISCHARGE OCCURS:

PALERMO REARING STATION
200 Gore Road
Palermo, Maine 04354

RECEIVING WATER / CLASSIFICATION: Sheepscot River, Class B; Long Pond, Class GPA

COGNIZANT OFFICIAL AND TELEPHONE NUMBER:

Mr. Jamie Bray Facility Manager (207) 993-2361
Mr. Steve Wilson, MDIFW Hatchery Supervisor (207) 287-5262

1. APPLICATION SUMMARY

The applicant has applied for a renewal of Waste Discharge License (WDL) #W-002035-5Q-A-R, which was issued on July 21, 2000, for a five-year term. The WDL approved the discharge of a maximum of 3.9 million gallons per day (MGD) of fish hatchery wastewater to the Sheepscot River, Class B from a state brook trout and brown trout rearing facility in Palermo, Maine. The applicant has applied for an increase in the effluent flow limit established in the previous licensing action.

2. PERMIT SUMMARY

a. Regulatory - January 12, 2001 – The Department received authorization from the U.S. Environmental Protection Agency (USEPA) to administer the National Pollutant Discharge Elimination System (NPDES) permit program in Maine, excluding areas of special interest to Maine Indian Tribes. On October 30, 2003, after consultation with the U.S. Department of Justice, USEPA extended Maine's NPDES program delegation to all but tribally owned lands. In those areas, the Department maintains the authority to issue WDLs pursuant to Maine law. The extent of Maine's delegated authority is under appeal at the time of this permitting action. From this point forward, the program will be referred to as the Maine Pollutant Discharge Elimination System (MEPDES) program and permit #ME0001074 will be utilized as the primary reference number for the Palermo facility. Any previous NPDES permits issued by the EPA will be replaced by the MEPDES permit upon issuance. Once retired, all terms and conditions of any NPDES permits are null and void.

b. Terms and conditions – This permitting action is similar to the July 21, 2000 WDL in that it is carrying forward:

1. the monthly average and daily maximum reporting requirements for mass of fish on hand; and
2. the pH limit range of 6.0-8.5 standard units.

This permitting action is different from the July 21, 2000 WDL in that it is:

1. eliminating the 3.9 MGD daily maximum discharge flow limit and establishing a 4.75 MGD monthly average flow limit;
2. establishing BOD and TSS monthly average and daily maximum concentration limits with a provision for the Department to establish new limits in the future based on technology performance analyses of the industry as a whole;
3. establishing BOD and TSS monthly average mass limits based on previous WDL requirements and daily maximum mass limits based on revised concentration and flow limits;
4. establishing a year-round annual total phosphorus mass limit based on the assimilative capacity of Long Pond and monthly phosphorus mass reporting requirements;
5. establishing a seasonal total phosphorus monthly average concentration limit based on the assimilative capacity of the Sheepscot River and a daily maximum phosphorus concentration reporting requirement;
6. establishing seasonal monthly average and daily maximum orthophosphate mass and concentration monitoring requirements during 2006;
7. converting previous mass limits and reporting requirements from pounds of pollutant per 100 pounds of fish on hand to pounds of pollutant per unit of time;
8. establishing a daily maximum mass limit for formalin based on Department best professional judgement (BPJ) and monthly average mass and concentration reporting requirements;

9. establishing a daily maximum concentration limit for formalin based on the previously established formaldehyde limit for three years followed by a revised concentration limit based on Department BPJ of formalin toxicity, to provide for infrastructure, operation, and maintenance upgrades as appropriate to insure compliance;
10. establishing a daily minimum effluent limit and monthly average and daily maximum monitoring requirements for effluent dissolved oxygen;
11. establishing minimum monitoring frequency and sample type requirements based on BPJ;
12. restricting approved outfalls to #005A for normal treated wastewater discharges and #006A for emergency bypass;
13. eliminating the reporting requirement for duration of discharge from the previous settling basin;
14. requiring a current facility Operation and Maintenance Plan;
15. establishing requirements for settling basin cleaning;
16. requiring compliance with existing state salmonid fish health rules;
17. requiring development and submittal of Biosecurity and Disease Contingency Plans;
18. establishing requirements related to proper use and record keeping of therapeutic agents;
19. eliminating effluent limits for chlorine and establishing record keeping requirements for disinfecting/sanitizing agents;
20. establishing BPJ derived minimum treatment technology requirements for the Palermo facility;
21. establishing requirements for annual ambient macroinvertebrate biomonitoring beginning in 2007;
22. replacing previous receiving water study requirements with requirements for ambient dissolved oxygen and temperature monitoring studies; and
23. requiring a fish Containment Management System with provisions for auditing and reporting.

c. History: The most recent licensing/permitting actions include the following:

February 20, 1975 – The USEPA issued NPDES Permit #ME0001074 to the Maine Department of Inland Fisheries and Game for the discharge of an unspecified volume of wastewater from the Palermo Rearing Station to the Sheepscot River. The Permit was valid through February 15, 1980.

March 3, 1975 – The Maine Department of Environmental Protection issued WDL #659 to the Maine Department of Inland Fisheries and Game for the discharge of an average of 3.26 MGD of fish hatchery wastewater from the Palermo Rearing Station to the Sheepscot River, Class B-1. The WDL was valid until February 12, 1978.

September 28, 1977 – The Maine Board of Environmental Protection ordered WDL #659 amended based on effluent monitoring data conducted since issuance of the WDL. Although not identified as part of the intended modification, Department files indicate an inconsistency in the discharge flow limits in the WDL and amendment. The amendment listed the discharge flow as a daily average of 2.4 MGD from the "old line" outfall and 1.6 MGD from the "new line" outfall.

March 8, 1978 – The Maine Department of Environmental Protection issued WDL # 2035 to MDIFW for the discharge of a daily maximum of 2.9 MGD from the "old line" outfall and 2.0 MGD from the "new line" outfall of treated fish hatchery wastewater from the MDIFW Palermo hatchery to the Sheepscot River, Class B-1. The WDL was issued for a five-year term.

March 8, 1982 – The USEPA accepted MDIFW's NPDES Permit reapplication as complete. Department files contain no evidence of further permitting actions by USEPA for this facility.

May 11, 1983 – The Maine Board of Environmental Protection issued WDL #2035 for the discharge of a daily maximum of 2.9 MGD of treated fish hatchery wastewater from the MDIFW Palermo hatchery to the Sheepscot River, Class B-1. The WDL was issued for a five-year term.

July 21, 2000 – The Department issued # W-002035-5Q-A-R to MDIFW Palermo hatchery for the discharge of a daily maximum of 3.9 MGD of treated fish hatchery wastewater. The WDL was issued for a five-year term.

September 10, 2001 – The Department suspended monitoring requirements established in WDL # W-002035-5Q-A-R for Outfall #001A, designated for effluent discharges from the settling basin when not cleaning raceways. The Department required monitoring for Outfalls #001B and #002A, designated for effluent discharges from the settling basin when cleaning raceways and from flow-through water through the west line of raceways respectively, to be conducted by autocompositer. The Department made no mention of Outfall #003A, previously designated for a summary of the flow, mass of fish on hand, and total phosphorus values from Outfalls #001A, #001B, and #002A. However, Department files contain no subsequent monitoring results for Outfall #003A.

February 2002 – On behalf of MDIFW, Fishpro Inc. submitted an Alternative Discharge Study report for all nine MDIFW hatcheries and rearing stations. The study evaluated eliminating effluent discharges through: piping the discharges to larger receiving waters, connecting to municipal wastewater treatment facilities, wastewater storage collection, land application of wastewater, and discharging to existing wetland areas. The study determined that none of the alternatives evaluated were viable options for the MDIFW facilities.

September 12, 2002 – The Department submitted a report entitled *Maine Department of Environmental Protection Water Quality Concerns and Effects from State Fish Hatchery Discharges* to the Maine Legislature's Inland Fisheries and Wildlife Subcommittee's Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine and MDIFW.

November 2002 – FishPro Inc. submitted to MDIFW its *Comprehensive Statewide Fish Hatchery System Engineering Study* addressing recommended upgrades to all MDIFW fish hatcheries and rearing facilities.

July 11, 2003 – The Department administratively modified WDL # W-002035-5Q-A-R to extend the 3-year schedule of compliance for BOD, TSS, and phosphorus effluent limits established in the WDL through the life of the WDL.

July 5, 2005 - The Department received an application from MDIFW for renewal of the WDL for the discharge of fish hatchery wastewater from the Palermo facility. The application was assigned WDL # W-002035-5Q-B-R and MEPDES permit #ME0001074.

d. Source Description/ Facility Operation:

The MDIFW Palermo facility was constructed in 1949 as a state aquaculture facility. MDIFW Palermo is a fish rearing station, raising brook trout and brown trout fingerlings obtained from other MDIFW hatchery facilities to appropriate sizes for stocking in Maine waters as part of MDIFW's responsibilities in managing fisheries in Maine. In May-June of each year, MDIFW Palermo obtains 1.5 to 2-inch long brook trout fingerlings from the Dry Mills (Gray) and Governor Hill (Augusta) hatcheries and 1.5 to 2-inch long brown trout fingerlings from the New Gloucester hatchery for rearing as described below. The MDIFW Palermo facility underwent significant upgrades in 2005. The narratives below indicate both historical and upgraded conditions.

Influent Water: Source water for the MDIFW Palermo facility is obtained from Sheepscot Lake through two intake pipes, a deep water (50-feet deep) 24-inch diameter iron pipe and a shallow water (20-feet deep) 16-inch diameter iron pipe. The deeper intake is fitted with a coarse screen on the lake end of the pipe, whereas the shallow intake is unscreened. The head of the facility is screened to prevent fish or large debris from entering the station. MDIFW Palermo blends influent water in a head box at the head of the facility raceway system, as needed to meet temperature requirements (58-60 degrees F) for its fish. Excess lake water flows are discharged to the Sheepscot River prior to contact with any station fish. MDIFW reports distances of approximately 800-feet from the Sheepscot Lake dam to the head of the Palermo facility and an additional approximately 600-feet to its wastewater outfall #005A. MDIFW Palermo is a flow-through facility with flows through each of two parallel raceway lines to the Sheepscot River, which in turn flows to Long Pond approximately four miles downstream.

Rearing Facilities: MDIFW Palermo's rearing facilities consist of two lines of covered concrete raceways referred to as the east side and west side raceways because of their orientation on the site. Influent water is blended at the head of the raceways and diverted down each line. The east side raceways consist of five sets of two raceway pools for a total of 10 individual raceway pools. Each of the east side raceway pools is 8-feet wide by 100-feet long. The west side raceways consist of 7 sets of three raceway pools for a total of 21 raceway pools. Each of the west side raceway pools is 5-feet wide by 100-feet long. All raceways are operated at a depth of 16-inches. Feeding is conducted manually and with demand and belt feeders. MDIFW Palermo indicates using an average of 165 pounds of food per day, a maximum of 240 lbs/day, and a period of peak feeding during April as well as August-October.

Typically, brook trout are kept in the east side raceways and brown trout are kept in the west side raceways. New fingerlings are placed in the upper most raceway pools, with the lower raceway pools reserved for 2-year old fish. Fingerlings are raised for both spring and fall stocking. In the spring, MDIFW stocks one-year old, 8-10-inch long brook trout and 6-8-inch long brown trout. New fingerlings are then brought on station for rearing as outlined above. In the fall (October-November), MDIFW stocks approximately 19-month old, 10-12-inch long brook trout and 10-12-inch long brown trout. MDIFW Palermo indicates a maximum quantity of fish on station of 140,000 first year fish weighing 23,333 lbs and 35,000 second year fish weighing 27,500 lbs for a total of 175,000 fish weighing 50,833 lbs.

e. Wastewater Treatment: To clean the raceways, MDIFW staff have historically scrubbed the sides and bottoms from the top end of the raceway pool moving down-flow toward the bottom end. At the bottom of all raceway pools except the final 2 sets (6 raceway pools) on the west side raceways, was located a screened 1.5-foot long "quiescent zone" with a covered discharge pipe routed through a 12-inch diameter iron pipe to the facility settling basin described below. When approximately half of the pool's length was cleaned, the discharge pipe "plug" was removed, sending cleaning flows to the settling basin. After the raceway pool and quiescent zone screen were cleaned, the quiescent zone plug was replaced and the cleaners move to the next raceway pool. Due to the physical layout of the facility, cleaning water for the final two sections of the west side raceways bypassed the settling basin and flowed directly to the Sheepscot River without treatment. Raceways were cleaned 2-3 times per week during the summer when fingerlings were on station and weekly during the winter when numbers of fish were reduced. MDIFW Palermo indicates that it takes approximately 10 minutes to clean each raceway pool and 2-3 hours to clean all pools.

Historically, MDIFW Palermo has provided wastewater treatment through settling in a 40-foot by 100-foot by 3-foot deep (89,760 gallons) concrete settling basin located at the end of the east side raceways. The settling basin received flow-through water from the east side raceways (previous Outfall #001A) as well as cleaning wastewater from the east side raceways and 5 sets (15 raceway pools) of the west side raceways (previous Outfall #001B). The flow-through water from the west side raceways and the cleaning wastewater from the final 2 sets (6 raceway pools) of west side raceways discharged directly to the Sheepscot River (previous Outfall #002A) with no treatment of the wastewater. Historically, the settling basin was infrequently cleaned with deposited solid waste material, over which flow-through and cleaning wastewaters flowed, accumulating to significant depths.

Wastewater Treatment Upgrade: During 2005, MDIFW Palermo underwent a series of facility improvements and upgrades to incorporate the following:

-new influent pipe screens for better exclusion of wild fish and debris, followed by influent strainers to remove silt and finer debris.
-a dissolved oxygen management system for the flow-through water with bulk liquid oxygen and low head oxygen contact chambers placed at the head of every other set of raceway pools.
-installation of raceway flow baffles to provide for better flow and transport of waste materials to the quiescent zones.
-increased size of the quiescent zones to provide for better settling and holding of solid waste material until they are removed.
-installation of a common raceway drain line to intercept cleaning flows from all raceway pools to a new wastewater treatment system.
-improved management of facility wastewater flows to route all cleaning wastewater through a clarifier, followed by a microscreen drum filter, then discharge. Also, management of flow-through water through the microscreen drum filter, then discharge.
-replaced the existing settling basin with a new clarifier (20-feet by 20-feet by 16-feet (47,872-gallons)) that will receive all raceway cleaning wastewater, drum filter backwash wastewater, and that is designed for automatic sludge removal to an adjoining sludge storage/dewatering tank (20-feet by 20-feet by 16-feet (47,872-gallons)) that is designed to provide a minimum of 6-months of storage capacity. Sludge tank supernatant is routed back to the clarifier unit for additional treatment.
-installation of a 30-micron drum filter for filtration of all flow-through wastewater and all cleaning wastewater after settling prior to discharge.

MDIFW Palermo's revised standard procedures involve full wastewater treatment of all effluent flows and discharge through Outfall #005A, a 36-inch diameter pipe. However, MDIFW has designed for a bypass of the facility drum filter in the event of routine filter maintenance or in the case of unforeseen filter equipment malfunction and necessary major repairs. During such times, MDIFW will not clean or feed its fish so that all effluent discharges will consist of flow-through water only. Additionally, MDIFW Palermo has maintained a separate emergency bypass to be used only during a catastrophic facility event such as a major flood. This function is served by the 36-inch diameter outfall pipe previously designated as Outfall #002A, but is being re-designated as Outfall #006A to distinguish between the pre and post upgraded facility. As Outfall #005A was installed approximately two feet lower than the previous outfall pipe during facility upgrades in order to maintain gravity flow discharges, MDIFW Palermo is concerned about severe river flood events backing up the discharge pipe into the facility and washing its fish stock into the river. To prevent this unusual occurrence, Outfall #006A is being maintained in an inactive state unless it becomes necessary to temporarily shut off flow through the main facility outfall (#005A) and reroute it through Outfall #006A. Regardless of the scenarios described, MDIFW Palermo's discharge is at all times subject to the effluent limitations and monitoring requirements established in this permitting action.

Use of agents for therapeutic and disinfecting/sanitizing purposes are addressed in subsequent Fact Sheet sections titled accordingly.

3. CONDITIONS OF PERMITS

Maine law, 38 M.R.S.A. Section 414-A, requires that the effluent limitations prescribed for discharges, including, but not limited to, effluent toxicity, require application of best practicable treatment (BPT), be consistent with the U.S. Clean Water Act, and ensure that the receiving waters attain the State water quality standards as described in Maine's Surface Water Classification System. In addition, 38 M.R.S.A., Section 420 and Department rule 06-096 CMR Chapter 530, *Surface Water Toxics Control Program,* require the regulation of toxic substances not to exceed levels set forth in Department rule 06-096 CMR Chapter 584, *Surface Water Quality Criteria for Toxic Pollutants*, and that ensure safe levels for the discharge of toxic pollutants such that existing and designated uses of surface waters are maintained and protected.

4. RECEIVING WATER QUALITY STANDARDS:

Maine law, 38 M.R.S.A., Section 467.17.A(1) classifies the Sheepscot River at the point of discharge as a Class B water and notes, "*...the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained*". Maine law, 38 M.R.S.A., Section 465.3, describes the standards for Class B waters.

Long Pond is classified as a Class GPA water pursuant to Maine law, 38 M.R.S.A., Section 465-A. Therefore, the Sheepscot River at the point of discharge, being approximately 4 miles upstream of Long Pond, entails a tributary to a GPA water. Maine law, 38 M.R.S.A., Section 464.4.A states, "*...the department may not issue a water discharge license for...*" (2) a "*New direct discharge of domestic pollutants to tributaries of Class-GPA waters*" or (3) "*Any discharge into a tributary of GPA waters that by itself or in combination with other activities causes water quality degradation that would impair the characteristics and designated uses of downstream GPA waters or causes an increase in the trophic state of those GPA waters*".

5. RECEIVING WATER QUALITY CONDITIONS:

The State of Maine 2004 *Integrated Water Quality Monitoring and Assessment Report* (DEPLW0665), prepared pursuant to Sections 303(d) and 305(b) of the Federal Water Pollution Control Act includes the receiving water in the designation *Sheepscot River below Sheepscot L*(ake) (Assessment Unit ME0105000305, Segment ID 528R08), listed in Category 5-A, Rivers and Streams Impaired by Pollutants Other Than Those Listed in 5-B Through 5-D (TMDL Required). The listing identifies a 4.0 mile segment of Class B water determined in 2003 to be not attaining its aquatic life standard due to dissolved oxygen impacts from the Palermo station and indicates that a TMDL (total maximum daily load) analysis is planned for 2006. Further, Department biomonitoring conducted in the Sheepscot River below the Palermo station in 1999 revealed that the macroinvertebrate communities in the river are not indicative of Class B waters, further non-attainment of the aquatic life

standard. All freshwaters in Maine are listed as only partially attaining the designated use of recreational fishing due to a fish consumption advisory (Category 5-C). The advisory was established in response to elevated levels of mercury in some fish caused by atmospheric deposition. The Department has no information that the Palermo facility causes or adversely contributes to the consumption advisory. However, the Department finds that MDIFW Palermo has caused or adversely contributed to the other non-attainment conditions indicated and is establishing effluent limitations, monitoring and operational requirements accordingly, including requirements for ambient macroinvertebrate biomonitoring (Permit Special Condition M) and ambient monitoring for dissolved oxygen and temperature (Permit Special Condition N).

If it is determined that non-attainment conditions persist in the receiving water(s) and that MDIFW Palermo causes or contributes to those conditions, this permitting action may be reopened pursuant to Permit Special Condition P and effluent limitations, monitoring and operational requirements, and/or wastewater treatment requirements adjusted accordingly.

6. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS:

On June 30, 2004, USEPA finalized the Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category (National Effluent Guidelines). The earlier September 12, 2002 proposed National Effluent Guidelines (NEGs) and subsequent working draft NEGs established numerical limitations for the discharge of TSS and requirements for facilities to develop and implement best management practices (BMP) plans for control of other pollutants.

In the final NEGs, EPA expressed effluent limitations in the form of narrative standards, rather than as numerical values. The final NEGs require facilities to develop and implement BMPs regarding operation and maintenance of the facility, as does this permitting action. EPA stated that it determined it more appropriate to promulgate limits "*...that could better respond to regional and site-specific conditions and accommodate existing state programs in cases where these appear to be working well.*" The final NEGs reference a section of the federal Clean Water Act inclusive of 40 CFR, Part 125.31(f), which states, "*Nothing in this section shall be construed to impair the right of any State or locality under section 510 of the Act to impose more stringent limitations than those required by Federal law.*" Section 510 states, "*Except as expressly provided in this Act, nothing in this Act shall (1) preclude or deny the right of any State...to adopt or enforce...any standard* o(r) *limitation respecting discharges of pollutants, or...any requirement respecting control or abatement of pollution; except that if an effluent limitation...or standard of performance is in effect under this Act, such State...may not adopt or enforce any effluent limitation...or standard of performance which is less stringent than the effluent limitation...or standard of performance under this Act; or (2) be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters...of such States* ".

Pursuant to Maine Law (38 M.R.S.A., §414-A.1), the Department shall only authorize discharges to Maine waters when those discharges, either by themselves or in combination with other discharges, "*will not lower the quality of any classified body of water below such classification*". *Further, "the discharge will be subject to effluent limitations that require application of the best practicable treatment". "Best practicable treatment* (BPT) *means the methods of reduction, treatment, control and handling of pollutants, including process methods, and the application of best conventional pollutant control technology or best available technology economically available, for a category or class of discharge sources that the department determines are best calculated to protect and improve the quality of the receiving water and that are consistent with the requirements of the Federal Water Pollution Control Act" (40 CFR). "If no applicable standards exist for a specific activity or discharge, the department must establish limits on a case-by-case basis using best professional judgement...*" considering "*...the existing state of technology, the effectiveness of the available alternatives for control of the type of discharge and the economic feasibility of such alternatives...*". Pursuant to 38 M.R.S.A, §414-A.1 and §464.4, the Department regulates wastewater discharges through establishment of effluent limitations and monitoring requirements that are protective of Maine waters.

Between calendar years 2000 and 2002, eleven Maine fish hatcheries were evaluated to identify potential options for facility upgrades. All nine Maine Department of Inland Fisheries and Wildlife hatcheries were evaluated by FishPro Inc., while the two USFWS hatcheries were evaluated by the Freshwater Institute. Recommended wastewater treatment upgrades for each of the facilities included microscreen filtration of the effluent. Based on the information provided and Department best professional judgement (BPJ), the Department is specifying that minimum treatment technology for the MDIFW Palermo facility shall consist of treatment equal to or better than 60-micron microscreen filtration of the effluent, wastewater settling/clarification, and removal of solids (Permit Special Condition L, Fact Sheet Section 13). MDIFW Palermo shall provide treatment equal to or better than the BPJ minimum treatment technology and shall comply with all effluent limitations, monitoring requirements, and operational requirements established in this permitting action. Additional treatment may be necessary to achieve specific water quality based limitations.

The previous licensing action established the following outfall designations and corresponding processes: Outfall #001A for effluent discharges from the settling basin when not cleaning raceways; Outfall #001B for effluent discharges from the settling basin when cleaning raceways; Outfall #002A for effluent discharges from flow-through water through the west (south) line of raceways; Outfall #003A for a summary of the flow, mass of fish on hand, and total phosphorus values from Outfalls #001A, #001B, and #002A. Additional outfalls were established to correspond to locations and timings of in-stream water quality monitoring, and are addressed in the corresponding Fact Sheet section. This permitting action is revising outfall designations to correspond to actual physical discharge points only. The MDIFW Palermo facility outfalls shall be designated as: Outfall #005A for effluent discharges from the facility and Outfall #006A for any discharges through the emergency bypass pipe. These outfall designations are being renumbered to distinguish between the pre and post upgraded facility.

a. Flow: The previous licensing action established a daily maximum flow discharge limit of 3.9 MGD and a requirement to monitor and report the monthly average discharge flow. Discharge flow was required to be measured at a frequency of once per month. The previous licensing action established effluent limits and monitoring requirements for discharge flow for Outfalls #001A, #001B, #002A, and #003A as described above, but specified that the flow value for Outfall #002A corresponded to the flow when the south (west) line of raceways were not being cleaned. As all of these processes were assumed to be distinctly separate, the 3.9 MGD limit was established for each outfall designation. In September 2001, the Department suspended monitoring requirements and effluent limits for Outfall #001A, as described in Fact Sheet Section 2c. The previous licensing action established an Effluent Limitation Compliance Schedule that required compliance with effluent limits within three years of the effective date of the WDL and delayed imposition of the limits until that time. The WDL compliance schedule was administratively modified also as described in Fact Sheet Section 2c. MDIFW has requested an increase in the discharge flow limit. In this permitting action, the Department is eliminating the daily maximum flow limit and establishing a monthly average flow limit of 4.75 MGD based on information provided by MDIFW on facility operations and design capacity and to provide the facility with operational flexibility. However, since the Sheepscot River is a tributary to a Class GPA water, in which no new direct discharges of pollutants are allowed, mass pollutant limits shall be based on previous license limits, as described below. This permitting action requires daily measurement of discharge flow, consistent with Department guidelines for wastewater treatment facility discharges.

b. Dilution Factors: Dilution factors associated with wastewater discharges are derived in accordance with freshwater protocols established in Department Regulation Chapter 530, Surface Water Toxics Control Program, October 2005 and methods for low flow calculation contained in Estimating Monthly, Annual, and Low 7-day, 10-year Streamflows for Ungaged Rivers in Maine (Scientific Investigations Report 2004-5026, US Department of Interior, US Geological Service). To calculate potential effects from a facility's effluent discharge, the Department utilizes the receiving water's available dilution during low flow conditions. The MDIFW Palermo facility discharges its treated effluent via a discharge pipe into the side of the Sheepscot River. Typically, these types of discharges do not achieve rapid and complete mixing with the receiving water since initial dilution is based on mixing resulting from the momentum of a discharge as it exits a discharge pipe (jet effect) as well as the dispersion of the effluent plume as it rises to the surface of the receiving water. Chapter 530.4.B(1) states that analyses using numeric acute criteria for aquatic life must be based on ¼ of the 1Q10 stream design flow to prevent substantial acute toxicity within any mixing zone. The regulation goes on to say that where it can be demonstrated that a discharge achieves rapid and complete mixing with the receiving water by way of an efficient diffuser or other effective method, analyses may use a greater proportion of the stream design, up to including all of it. In developing the previous WDL, the Department utilized a chronic dilution of 3:1 based on a 7Q10 low flow value of 7.8 MGD and MDIFW Palermo's daily maximum discharge limit of 3.9 MGD. However, this approach appears to have been incorrect. MDIFW owns the dam on Sheepscot Lake. There is no formal water level order or agreement on Sheepscot

Lake nor is there any formal requirement specifying a minimum flow that must be passed over or through the dam to the Sheepscot River. MDIFW Palermo reports that the Sheepscot River has at times been completely dewatered between the dam and the head of the MDIFW Palermo facility. At those times, the MDIFW Palermo discharge constitutes the only flow in that portion of the Sheepscot River. Based on this information, the Department must assume a seasonal low flow of 0 cubic feet per second in the Sheepscot River and acute (1Q10), chronic (7Q10) and harmonic mean dilution factors of 1:1, representative of the fact that the MDIFW Palermo discharge sometimes constitutes the only river flow. If MDIFW wishes to establish a guaranteed minimum flow from the Sheepscot Lake dam in the future, this determination may be revisited.

c. BOD and TSS: The previous licensing action contained monthly average concentration limits of 2 mg/L and monthly average mass reporting requirements in pounds of pollutant per 100 pounds of fish on hand for both biochemical oxygen demand (BOD) and total suspended solids (TSS). Monitoring requirements consisted of a composite of a minimum of four grab samples collected at two hour increments during a facility working day at a frequency of once per month. The previous licensing action established effluent limits and monitoring requirements for BOD and TSS for Outfalls #001A, #001B, and #002A, as described above. In September 2001, the Department suspended monitoring requirements and effluent limits for Outfall #001A, as described in Fact Sheet Section 2c. The previous licensing action established an Effluent Limitation Compliance Schedule that required compliance with effluent limits within three years of the effective date of the WDL and delayed imposition of the limits until that time. The WDL compliance schedule was administratively modified also as described in Fact Sheet Section 2c.

In licensing actions for twelve state and commercially owned fish hatcheries in 1999 and 2000, the Department established monthly average concentration limits for BOD and TSS of 2 mg/L based on the Department's best professional judgement of best practicable treatment (BPJ of BPT) limits. The BPT limits were developed based on the Department's analysis of effluent data from licensed fish hatcheries in Maine supplied through Discharge Monitoring Reports (DMRs). Based on this analysis, the Department determined that the concentration limits of 2 mg/L constituted achievable levels of these pollutants in fish hatchery wastewater. The Department also required that the BOD and TSS effluent mass be monitored and reported in pounds per 100 pounds of fish on hand. Through extensive facility inspections in 2002, the Department discovered significant variability in facility effluent sampling procedures, calling into question the validity of submitted DMR data, the previous data analysis, and the Department's previous assumptions and conclusions.

In the 2002 proposed NEGs, EPA recommended national TSS effluent limitations for re-circulating and flow-through hatcheries of various designs and levels of production. The most restrictive recommended limits were based on a secondary level of fish hatchery wastewater treatment and consisted of a monthly average limit of 6 mg/L and a daily maximum limit of 10 mg/L. The 2002 proposed draft NEGs did not propose to regulate BOD as EPA believed it would be managed through best management practices at the hatcheries and treatment for TSS.

According to EPA's final NEGs, effluent from fish hatcheries and rearing facilities can contain "*...high concentrations of suspended solids and nutrients, high BOD and low dissolved oxygen levels. Organic matter is discharged primarily from feces and uneaten feed*". As stated in the 2002 proposed NEGs, "*elevated levels of organic compounds contribute to eutrophication and oxygen depletion.*" This is expressed as BOD "*...because oxygen is consumed when microorganisms decompose organic matter*". "*The greater the BOD, the greater the degree of pollution and the less oxygen available.*" The discharge of high BOD wastewater to small receiving waters with insufficient dilutions can result in formation of oxygen deficient areas known as sag points. Oxygen sag points represent both localized impacts to habitat and aquatic life as well as barriers to migration throughout the receiving water. Based on this premises and a long standing practice of regulating effluent BOD, the Department considers BOD a significant pollutant and therefore is establishing effluent limitations and monitoring requirements.

In this permitting action the Department is establishing a BPJ of minimum treatment technology for the MDIFW Palermo facility. (Permit Special Conditions L, Fact Sheet Section 13). BOD and TSS concentration limits of 6 mg/L for monthly average and 10 mg/L for daily maximum shall be in effect for Outfall #005A and Outfall #006A. These numbers are based on fish hatchery wastewater secondary treatment projections and the Department's judgement that effluent BOD should also be regulated. The Department has evaluated actual and projected post-facility upgrade effluent quality data for a significant number of fish hatcheries in Maine and determined that facilities incorporating the minimum treatment technology outlined can be expected to consistently meet the BOD and TSS concentration limits established in this permitting action. It is the Department's intent to re-evaluate and potentially revise limits in the future based on statistical evaluations of demonstrated performance of consistently and properly utilized treatment technology for the industry. The Department reserves the right to reopen facility discharge permits to establish these limits pursuant to Special Condition P of this permit. Pursuant to 38 M.R.S.A., Section 464.4.A, "*...the department may not issue a water discharge license for...*" (2) a "*New direct discharge of domestic pollutants to tributaries of Class-GPA waters*". Therefore, to calculate applicable mass limits for BOD and TSS, the Department is utilizing the previous WDL monthly average concentration limits of 2 mg/L (ppm), the previous maximum flow limit of 3.9 MGD, and a conversion factor of 8.34 lbs/gallon to yield monthly average mass limits of 65 lbs/day. The daily maximum mass limits are based on the newly established daily maximum concentration limits of 10 mg/L, new monthly average flow limit of 4.75 MGD, and a conversion factor of 8.34 lbs/gallon to yield 396 lb/day daily maximum limits. The Department anticipates that the monthly average mass limits will be limiting factors for the MDIFW Palermo discharge, thus meeting the provisions of 38 M.R.S.A., Section 464.4.A noted above. As the number and mass of fish on station increases, MDIFW Palermo may need to provide additional wastewater treatment that will hold effluent quality constant.

In this permitting action, mass is limited in the more conventional unit of pounds per day instead of the previous pounds per hundred pounds of fish on hand. This permitting action establishes once per two week effluent BOD and TSS monitoring on a year round basis

based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.

d. Total Phosphorus and Orthophosphate: Phosphorus is a nutrient that encourages the growth of plants such as planktonic algae and macrophytes in northern waters. Oxygen levels in the water are reduced in the early morning hours due to extended nighttime respiration of algae. The decomposition of excess plant material further reduces the amount of available oxygen in the water through biochemical oxygen demand. Lowering oxygen levels in a receiving water impacts the aquatic life in that water, making it unfit for some forms of life. Further, enrichment from excess nutrients, such as phosphorus, can result in reductions in aquatic macro-invertebrate species diversity, an indicator of the overall health of a receiving water. Excess phosphorus can also result in undesirable aesthetic conditions in a receiving water, impacting that water's ability to meet standards for maintaining recreational use, a designated use by law. Therefore, any increase in the phosphorus content in a receiving water has the potential to cause or contribute to non-attainment of classification standards. Orthophosphate is the portion of total phosphorous that is readily available for uptake by aquatic plants. It is important to be able to characterize the facility effluent in terms of the relationship between orthophosphate and total phosphorus in order to better understand the effects on the receiving water. Maine law (38 MRSA § 464.4.A.4) states that *"...the Department may not issue a water discharge license for...the...discharge of pollutants to waters of the State that...cause those waters to be unsuitable for the designated uses and characteristics ascribed to their class"*. Phosphorus and orthophosphate concerns for the MDIFW Palermo facility are two-fold in that the facility discharges its effluent to the Sheepscot River (Class B) that serves as a tributary to Long Pond (Class GPA). Both types of waters are sensitive to these pollutants, but must be managed differently to avoid adverse effects.

The previous licensing action contained a monthly average phosphorus concentration limit of 0.011 mg/L from May through September and 0.022 mg/L from October through April, as well as a monthly average mass reporting requirement in pounds of phosphorus per 100 pounds of fish on hand for Outfalls #001A, #001B, and #002A. The required minimum detection level for phosphorus was 0.001 parts per million (ppm). Monitoring requirements consisted of a composite of a minimum of four grab samples collected at two hour increments during a facility working day at a frequency of once per month. The previous licensing action also established monthly average phosphorus mass limits for Outfall #003A consisting of 5 kilograms per month (11 lbs/month) from May through September, 10 kgs/month (22 lbs/month) from October through April, and an annual mass limit of 22.1 kgs/year (48.7 lbs/year), all required to be calculated at a frequency of once per month. In September 2001, the Department suspended monitoring requirements and effluent limits for Outfall #001A, as described in Fact Sheet Section 2c. As outlined in Fact Sheet Section 2c, the Department made no mention in this action of Outfall #003A, previously designated for a summary of the flow, mass of fish on hand, and total phosphorus values from Outfalls #001A, #001B, and #002A. However, Department files contain no subsequent monitoring results for Outfall #003A. The previous licensing action established an Effluent Limitation Compliance Schedule that required compliance with effluent limits within three years of the effective date of the WDL and delayed

imposition of the limits until that time. The WDL compliance schedule was administratively modified also as described in Fact Sheet Section 2c. The phosphorus limits contained in the previous WDL originated from Department BPJ of water quality based limits necessary to protect the receiving water and its designated uses at the time of issuance.

Lake Concerns: Pursuant to information received from the Department's Division of Watershed Management (DWM), in implementation of the above standard (38 MRSA § 464.4.A.4), which is also applied to changes of land use in lake watersheds in Section 465-A, the Department has recognized (1) that most lakes can accept some small increment of increased phosphorus load before they will demonstrate a perceivable increase in trophic state, and (2) that this increment would more likely be the result of the cumulative loading from a number of sources and not be provided by one source. This is the basis for the phosphorus technical guide (Phosphorus Control in Lake Watersheds: A Technical Guide for Evaluating New Development. DEP, 1992), which is used under Department Regulation, Chapter 500, Stormwater Management, the Site Location of Development Law (38 MRSA, §§ 481-490), and many town land use ordinances to define a maximum allowable increase in phosphorus load to each lake which will not risk a perceivable increase in trophic state; and to distribute that increase among proposed and anticipated development activities in the lake's watershed.

The 1992 phosphorus technical guide defines the maximum increment of increased phosphorus content that will not risk a perceivable increase in lake trophic state. This "acceptable increase in phosphorus concentration" is a function of the lake's current water quality, its potential for developing a significant phosphorus recycling problem, and whether or not it supports, or has the potential to support, a coldwater fishery. Since the Department never recommends a "low level of protection", the acceptable increase in phosphorus concentration ranges from 0.5 parts per billion (ppb) or lower for some severely blooming lakes to 1.5 ppb. The 1992 guide provides the best available guidance on how much lake phosphorus concentrations could be increased without causing a perceivable increase in trophic state, and has been used to define this concept for Site Location Law projects in lake watersheds since 1987. In the technical guide, an empirical input-output originally proposed by Vollenweider (1976) and refined by Larsen and Mercier (1976), is used to estimate the increase in load that would result in a given increase in phosphorus concentration.

The technical guide recognizes that development of lake watersheds and the resulting nonpoint sources of phosphorus will continue over time, and that it is the cumulative effect of this additional development which will cause increases in lake trophic state. It also recognizes that long term moratoria on development are not viable, so the available phosphorus load cannot be granted to new development on a first come, first serve basis. The guide addresses this issue by allocating the available phosphorus load over all anticipated development, thus requiring all regulated new development to share in the burden of phosphorus mitigation by implementing stormwater management best management practices (BMPs) and/or reducing density.

The technical guide for evaluating development related stormwater impacts on lakes provides a quantifiable means for defining the increase in phosphorus load which would result in an increase in trophic state. The Department has worked to determine how much of this available load should be allocated to a single point discharge of phosphorus. The technical guide allocates load based on the size of the parcel being developed, the logic being that the more of the watershed one owns, the more opportunity one should have to generate stormwater related phosphorus loading to the lake. This allocation method does not work for point sources, however, since they almost always have an extremely small parcel size relative to the phosphorus content proposed in the discharge. For example, areal phosphorus (P) allocations for development typically range from 0.02 lb P/acre/yr to 0.15 lb P/acre/yr. In a watershed with an allocation of 0.10 lb P/acre/yr, a point source that discharged 100 pounds P per year would have to own 1,000 acres of land if it was held to the same criteria as development sources. Obviously, if the Department is to make licensed point discharges to GPA tributaries a feasible option, it must apply a different means of allocating the available phosphorus load than the one used in the Stormwater and Site Laws.

The Department has determined that the portion of the available phosphorus load that can be applied to a licensed, point discharge should be lake and watershed specific and should consider the magnitude and likely rate of growth of other activities in the watershed. The Department must also ensure that the phosphorus allocated to the single, or few, point discharges to a lake's tributaries is small enough so that it leaves reasonable room for all other parties with development, forestry or agricultural interests within the lake's watershed. The starting point of the rationale should be the maximum allowable increase in phosphorus load which will not risk a perceivable increase in trophic state as defined by the methodology discussed above and presented in the phosphorus technical guide. Based on these considerations, the Department's DWM recommends that the percent of the available phosphorus load allocated to point sources be a function of the relative growth rate in the watershed of the receiving GPA waterbody as follows: High Growth Rate - 10%, Medium Growth Rate - 15%, and Low Growth Rate - 20%. In high growth areas more individuals are competing for the available phosphorus load, thus the areal allocation is low, usually 0.02 – 0.05 lb/acre/yr and the limitations placed on individual developments are more stringent than in low growth areas. So, it is appropriate that the limitations on point sources in high growth watersheds be more stringent as well. In the case of hatcheries whose water source is from a stream or other water source draining to the lake where it can be assumed the background phosphorus in the withdrawn supply water would have reached the lake anyway, the allowable increase in annual phosphorus discharge loads may be added to estimates of background load to calculate the allowable total discharge load.

IF&W Hatchery, Palermo, Sheepscot River, tributary to Long Pond

Long Pond in Somerville and Windsor is a shallow, moderately productive warmwater fishery lake, with relatively high natural dissolved color. Its water quality category is moderate/stable and its recommended level of protection is medium. The acceptable increase in lake phosphorus concentration is 1.25 ppb (from Table 3-2 in the phosphorus

technical guide), and the resulting allowable increase in phosphorus load to the lake is 147.6 kg/yr (325.4 lbs/yr). The growth rate in this watershed is fairly low now, but as the Augusta and Belfast growth centers continue to expand, growth in this watershed is likely to increase, so the appropriate growth rate for the watershed is moderate. Given these values, the resulting allocation for point source discharges would be 0.15 X 147.6 kg/yr or 22.1 kg/yr (48.7 lbs/yr), equivalent to the annual mass limit in the previous WDL. According to MEDEP's DWM, the facility is currently discharging about 10 times this amount, so a very substantial reduction in the discharge would be required. However, because of the high dissolved color in the lake and the resulting reduction in sensitivity to phosphorous, the Department believes there may be capacity to add a small amount of additional phosphorus to the lake, increasing the acceptable increase in P concentration from 1.25 ppb to 1.5 ppb. If the additional 0.25 ppb is all allocated to MDIFW Palermo, then the resulting allocation would be 51.7 kg/yr (114 lbs/yr) above background, rather than 22.1 kg/yr (48.7 lb/yr). This is still considerably less than the current discharge and would require substantial treatment, but it may at least be technically feasible. This may seem severe, but the Department must also consider that the water leaving Long Pond feeds the Sheepscot River, a Salmon Conservation Plan River. The Sheepscot has exhibited low diurnal dissolved oxygen concentrations downstream probably resulting from excessive plant respiration, and the only means of addressing this stress is nutrient reduction. So limitation of this discharge is not only important to Long Pond, but to the Sheepscot River as well.

The 114 lbs/year water quality based total phosphorus mass limit entails MDIFW Palermo's allowable total phosphorus discharge contribution to Long Pond per year. The Department recognizes that the water source, the Sheepscot River, contains ambient levels of phosphorus that would naturally enter Long Pond (83 lbs/year, 37 kg/year). The Department calculated MDIFW Palermo's total allowable phosphorus discharge, including background levels of phosphorus in the source waters, to be 197 lbs/yr (89 kg/yr). Permits issued by this Department impose the more stringent of the calculated water quality based or BPT based limits. Previously established limits or facility past demonstrated performance values are sometimes used as BPJ of BPT values when formal BPT based limits are absent. Past demonstrated performance is not being utilized in this analysis for several reasons. First, as outlined above, monitoring data for Outfall #003A, which relates to the monthly and yearly phosphorus mass discharged, was not submitted. Second, MDIFW Palermo has undergone significant upgrades, which is anticipated to result in marked improvements in effluent quality and reductions in phosphorus discharges.

Mass limits from the previous WDL are more stringent than MEDEP DWM's revised water quality based limits. However, the revised mass limits are based on more recent analyses and information on this receiving water that was not available at the time of issuance of the previous WDL. The Department believes the revised water quality based mass limits will be protective of the receiving water and its designated uses and is therefore establishing an annual phosphorus mass limit of 197 lbs/year. A daily maximum mass limit is not being established to provide MDIFW Palermo with management flexibility to meet the yearly mass limits. However, this permitting action is requiring

MDIFW Palermo to report the mass of phosphorus discharged per month to provide for short term phosphorus management, as well as to identify either trends or effluent fluctuations related to seasonal and/or operational changes. The monitoring frequency of once per two weeks is designed to ensure that representative facility and effluent conditions are captured. As the revised mass limit is less stringent than the previously established limit, this permitting action does not establish a schedule of compliance for its implementation. The revised phosphorus mass limit is in effect as of the effective date of this permitting action.

River Concerns: For river and stream wastewater discharges, the Department typically utilizes a 0.035-mg/L instream phosphorus concentration limit (ambient water quality threshold) and the dilution provided in a receiving water to calculate water quality based effluent limits, a revised method of analysis from that used and available at the time of issuance of the previous WDL. Based on Department research, the AWQC of 0.035 mg/L corresponds to the maximum level at which algae blooms will not typically occur in a receiving river or stream under normal circumstances. As phosphorus is typically of concern under chronic discharge conditions, the 7Q10 dilution of 1:1 described in Fact Sheet Section 6b, Dilution Factors, is being utilized in calculation of a water quality based effluent concentration limit of 0.035 mg/L. As this limit is less restrictive than the seasonally varying limits established in the previous WDL and in consideration of the recent facility upgrade conducted, this permitting action is not establishing a schedule of compliance for its implementation. The revised phosphorus concentration limit is in effect as of the effective date of this permitting action. In free flowing rivers and streams, phosphorus and orthophosphate are typically summer time concerns for water quality. Therefore, this permitting action revises the previously established year round phosphorus concentration limits and monitoring requirements and establishes phosphorus concentration limits and phosphorous and orthophosphate monitoring requirements that are in effect from June 1 through September 30 each year. This permitting action establishes a once per two week monitoring requirement based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.

Both the Sheepscot River and Long Pond will receive phosphorus discharged from the Palermo facility. Both receiving waters are sensitive to the effects of this pollutant, therefore the discharge must be managed according to receiving water specific needs. This permitting action is establishing annual phosphorus mass limits based on water quality specific needs in Long Pond and seasonal phosphorus concentration limits based on water quality specific needs in the Sheepscot River. Limits and monitoring requirements are expressed in gross end-of-pipe values.

It should be noted that as the concentration and mass limits are calculated based on different receiving waters, compliance with the established concentration limit will not necessarily result in compliance with the established mass limit. The permittee will need to actively manage its phosphorus discharge to achieve compliance and prevent adverse impacts in the receiving waters.

Reported values shall be expressed in gross end-of-pipe values and phosphorous and orthophosphate analysis shall be conducted on the same sample collected. Laboratory analysis shall consist of a low-level phosphorus analysis with a minimum detection limit of 1 part per billion (1 ug/L), equivalent to the previous 0.001 mg/L detection limit. Based on the results of monitoring, the Department may reopen the permit in the future pursuant to Special Condition P to address facility specific effluent limitations, monitoring and operational requirements.

It must be noted that all new proposed discharges of pollutants or increases in pollutants in the existing discharge, excluding flow, are subject to the provisions for discharges to tributaries to GPA waters contained in 38 M.R.S.A., Section 464.4.A (2) and (3). Therefore, if MDIFW Palermo wishes to increase the number and mass of fish on station, it may need to provide additional wastewater treatment that will hold effluent quality constant.

e. Fish on Hand: The reporting requirement for monthly average and daily maximum mass of fish on hand is being carried forward from the previous licensing action. This parameter is intended to enable both the Department and the permittee in evaluating management practices at the facility and trends in effluent quality and receiving water impacts. The previous licensing action required measurement of fish on hand in pounds at a frequency of once per month for Outfalls #001A, #001B, #002A, and #003A to correspond to the individual raceway lines and the combined total on site. In September 2001, the Department suspended monitoring requirements and effluent limits for Outfall #001A, as described in Fact Sheet Section 2c. This permitting action establishes once per two week monitoring on a year-round basis based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.

f. Formalin: Fish hatcheries commonly use formalin based biocides for therapeutic treatment of fungal infections and external parasites of finfish and finfish eggs. Formalin products (Paracide-F, Formalin-F, or Parasite-S) contain approximately 37 percent by weight formaldehyde gas. USEPA Region 1 provided information related to formaldehyde concerns and limitations in hatchery permitting in Massachusetts specifying that formalin use should be consistent with U.S. Food and Drug Administration (FDA) labeling instructions (21CFR 1 § 529.1030).

However, toxicity data indicates that formalin is toxic to aquatic organisms at concentrations below FDA labeling guidelines. There are currently no ambient water quality criteria for formalin or formaldehyde established in Maine's Surface Water Toxics Control Program (Toxics Program, Chapter 584). Therefore, the Department is evaluating potential effects, effluent limitations, and monitoring requirements based on currently available information and best professional judgement.

EPA's hatchery permitting program in Massachusetts (EPA/MA) establishes acute and chronic water quality based effluent limits and requires Whole Effluent Toxicity testing in any calendar quarter in which formalin is used at a hatchery. EPA/MA's limits were developed based on work by Gerald Szal, Aquatic Ecologist, Massachusetts Department

of Environmental Protection (October 24, 1990). Szal's methodology is based on review of a U.S. Fish and Wildlife document (Bills et al. 1977) which lists lethal concentrations (LC_{50}s) of formalin for a variety of fingerling fish. Two species of *Ictalurid* common to Massachusetts waters were selected as appropriate indicator species. Black bullhead had a 96-hour LC_{50} of 62.1 ul/l (mg/L) and Channel Catfish had a 96-hour LC_{50} of 65.8 ul/l (mg/L).

In addition to the Szal information, the Department reviewed studies provided by EPA's hatchery permitting program in New Hampshire (EPA/NH): Environmental Impact Assessment for the Use of Formalin in the Control of External Parasites on Fish, January 1995 (Dr. Stanley Katz, Rutgers University), a 1995 amendment for review of its use as a fungicide on eggs (Katz), and a 1981 Environmental Assessment titled Use of Formalin in Fish Culture as a Parasiticide and Fungicide (John Matheson, USDA, Bureau of Veterinary Medicine). The most conservative results indicate an LC50 of 1.15 mg/L of formalin for ostracods from a study by Bells, Marking, and Chandler (1977) included in the 1995 and 1981 studies above.

The Department also reviewed the results of formalin toxicity testing on EPA's ECOTOX database. Published toxicity data contained LC50 values ranging by several orders of magnitude for the same species in the same studies.

Maine's toxics rules (Chapter 530.1.B) state, "*No person may discharge any toxic substance in any amount or concentration...that may cause or contribute to the failure of any classified body of surface water to attain its existing and designated uses or to meet narrative or numeric water quality criteria.*". Further, Chapter 530.3 states, "*the Department shall establish appropriate discharge prohibitions, effluent limits and monitoring requirements in waste discharge licenses...*" as needed to ensure compliance with water quality criteria, existing and designated uses. The Department found a large range of toxicity data for formalin with significant variation between studies. The Department typically uses the most conservative data in order to ensure protection of aquatic life in Maine, however the range of published toxicity data was so extensive and inconclusive that the Department determined that a more focused study specific to Maine waters was warranted. Using methods similar to those specified in Chapter 530 for establishing site specific criteria, the Department contracted with a commercial laboratory (Lotic Inc., Unity, Maine) in October 2003 to provide information on the acute toxicity of formalin to the water flea (*Ceriodaphnia dubia*), a species commonly used in freshwater toxicity testing. All testing was performed by a certified laboratory according to standard methods. According to Katz (1995), formalin undergoes oxidation to formic acid followed by metabolic oxidation by microorganisms to form carbon dioxide and water. The half-life of formalin in water is estimated at 36 hours. Considering the nature of formalin and its intermittent use, the Department determined that acute criteria would be most applicable for comparison.

As reported by the testing laboratory, Lotic Inc., dosing rates in the Department's testing "*were initially established for a range-finding evaluation bracketed by* (formalin) *concentrations between 4.05 and 500 mg/L using 5 dilutions (0.3 dilution factor)*". Pursuant to standard practices, the dosing ranges were modified downward "*in subsequent tests to more accurately bracket appropriate endpoint determinations (A-NOEC* (acute no-effect concentration), *LC50)*". A total of four series of tests were conducted with the final two test series (tests) consisting of duplicate "definitive" tests utilizing a 0.5 dilution factor. Lotic reported that trend analyses revealed clear concentration-response relationships for the final three tests. Based on Lotic's experience, differences in survival for the two definitive tests "*are within the realm of normal variability for the testing of dilute organic pollutants*". "*For the two definitive tests, the A-NOECs (IC10s) ranged between 0.62 and 2.5 mg/L; LC50s ranged between 5.13 and 20 mg/L*". "*The A-NOEC for formalin (Parasite S) for C. dubia could be as low as 0.62 mg/L*". However, based on the limited number of tests performed and "*given the test variability in the data for the two definitive tests*", Lotic recommended that "*it would be prudent to average the A-NOEC values from these two evaluations (1.56 mg/L)*". "*This value will still be well below the most conservative LC50 value reported (5.13 mg/L)*". USEPA'S National Exposure Research Laboratory reviewed the testing results and found the variances observed to be appropriate. Further, USEPA found utilization of the 1.56 mg/L value as the A-NOEC to be a reasonable approach supported by test results in formulating an agency best professional judgement determination. Therefore, based on the Department's best professional judgement, this A-NOEC is being utilized as the acute criteria for establishing a facility effluent limit. The Department notes that a permittee is free to undertake site specific and water specific toxicity analyses to provide additional information on the toxicity of formalin.

Multiplying the acute criteria by the low flow dilution factor of 1:1 described in Fact Sheet Section 6b, Dilution Factors, yields the following acute water quality based effluent limit:

1.56 mg/L (acute criteria) x 1 (dilution) = 1.6 mg/L acute formalin limit

Comparatively, the previous licensing action established a requirement stating, "*at no time shall the discharge of Formaldehyde exceed 5 milligrams per liter*". This limit was based on the Department's best professional judgement at the time. As formaldehyde constitutes 37% of formalin, the 5 mg/L limit would equate to a 13.5 mg/L formalin limit. Parts per million (ppm) and mg/L are equivalent measurements.

Actual effluent levels of formalin can be calculated based on the use and dilution available at the facility. MDIFW Palermo uses approximately 55 gallons of formalin per year for treatment of fungal infections and external parasites on the fish.

For treatments on fish, MDIFW Palermo administers formalin as needed to achieve a dose of 200 ppm in the rearing structures. Approximately 2.7-gallons of undiluted formalin is administered in one line of raceway pools at a time. Formalin is administered at the head of the line by drip and allowed to flow through the entire line over a one hour period. The

flow through water is then blended into the full facility wastewater and discharged to the receiving water. The facility monthly average discharge flow of 4.75 MGD equates to 197,917-gallons in the one hour treatment / flow exchange period. The end of pipe concentration from fish treatment can be calculated as follows:

197,917 gal facility wastewater / 2.7 gal formalin = 73,302:1 dilution
1,000,000 ppm (undiluted) formalin / 73,302 = 13.6 ppm formalin discharged

Permits issued by this department impose the more stringent of the calculated water quality based or best practicable treatment (BPT) based limits. Although no formal BPT based limit has been developed for formalin, the Department considers a facility's discharge under best management practices to correspond to a BPJ of BPT. The calculated water quality based effluent limit is significantly more stringent than the potential effluent formalin concentration from fish treatment and is therefore being established in this permitting action. As the calculated acute limit of 1.6 mg/L represents a new more stringent water quality based limit, the Department is establishing a schedule of compliance (Permit Special Condition G) pursuant to State Law, 38 M.R.S.A., Section 414-A.2 to address the investigation and implementation of operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit. From the effective date of the permit until December 31, 2008, a formalin effluent limit of 13.5 mg/L, based on the formaldehyde limit contained in the previous licensing action, shall be in effect. Beginning January 1, 2009, the 1.6 mg/L formalin limit shall be in effect. The Department has not determined an appropriate chronic limit for formalin use at this time.

This permitting action also establishes effluent mass limits pursuant to Department Rules, Chapter 523.6(f). The daily maximum mass limit is calculated based on the permittee's projected maximum amount of formalin used per day (4.5 gallons) times the specific gravity of formalin (9.13 lbs/gal), resulting in a value of 41 lbs/day. This method was used to provide for flexibility in management of necessary treatments and to ensure that formalin is not discharged in toxic amounts. Throughout the term of the permit, the permittee shall report the monthly average effluent formalin mass and concentration. Effluent values shall be determined through calculations, as described in Special Condition A, Footnote 5 and Fact Sheet Section 17.

This permitting action is establishing effluent limitations and monitoring requirements for formalin, as this is the commonly used form, and not for formaldehyde. The Department is requiring MDIFW Palermo to report therapeutic agents used at the facility that have the potential to be discharged to the receiving water.

g. Dissolved Oxygen (effluent): Because of the low dilution of facility effluent provided in the receiving water and to determine effluent effects on the receiving water, this permitting action establishes seasonal monthly average and daily maximum concentration monitoring requirements for effluent dissolved oxygen (D.O.). Further, based on Department modeling and to ensure compliance with Class B D.O. standards, this permitting action establishes a seasonal daily minimum effluent D.O. limit of 7.5 mg/L and once per week monitoring requirements from June 1 through September 30 each year. In addition to requirements established in Permit Special Condition A to report daily minimum, daily maximum, and monthly average concentration results, the permittee shall submit all data from effluent dissolved oxygen monitoring to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report pursuant to Permit Special Conditions A (footnote 6) and E.

h. pH: The previous licensing action contained the requirement, "*the pH shall not be less than 6.0 or greater than 8.5 at any time unless as naturally occurs in the receiving water*" for Outfalls #001A, #001B, and #002A, but contained no monitoring requirements. This permitting action is carrying forward the pH range limitation of 6.0-8.5 standard units consistent with the pH limit established in discharge licenses for other fish hatcheries, which is considered by the Department as a best practicable treatment standard. This permitting action establishes once per two week effluent pH monitoring on a year-round basis based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.

i. Duration of Discharge: The previous licensing action required the licensee to report the numbers of hours per month that raceways were cleaned. This permitting action eliminates this requirement, establishing instead a requirement to provide minimum treatment technology, development of operation and maintenance plans, and revised technology based and water quality based effluent limits and monitoring requirements.

j. Receiving Water Study: The previous licensing action required the licensee to monitor dissolved oxygen, BOD, TSS, and total phosphorus in the Sheepscot River at locations upstream and downstream of the outfall. Monitoring was required to be conducted in the mornings and afternoons between July 1 and September 30, 2000, and was designated as Outfalls #011A, #012A, #011P, and #012P. The intent of this requirement was to "*better quantify the characteristics of the hatchery effluent, the effectiveness of the various stages of treatment, and to determine effects on water quality...*". In this permitting action, the Department is utilizing other methods of assessing effluent effects on the receiving water and attainment of water classification standards through ambient macroinvertebrate biomonitoring, ambient dissolved oxygen and temperature monitoring, and effluent monitoring, and is therefore not carrying forward this requirement.

7. ANTI-BACKSLIDING

Federal regulation 40 CFR, §122(l) and Department rules Chapter 523.5(1) contain the criteria for what is often referred to as the anti-backsliding provisions of the Federal Water Pollution Control Act (Clean Water Act). In general, the regulation states that except for provisions specified therein, effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards or conditions in the previous permit. Allowable exceptions to the anti-backsliding provisions include when:

(1) material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation and

(2) information is available which was not available at the time of the permit issuance (other than revised regulations, guidance or test methods) and which would justify the application of less stringent effluent limitations at the time of permit issuance.

This permitting action revises previously established effluent limitations and monitoring requirements for several pollutants including BOD, TSS, and total phosphorus, which may appear less stringent. The rationale for these actions is contained in Fact Sheet Section 6, *Effluent Limitations & Monitoring Requirements*. The Department believes that these actions are consistent with the anti-backsliding provisions.

8. ANTI-DEGRADATION

Maine's anti-degradation policy is included in 38 M.R.S.A., Section 464(4)(F) and addressed in the *Conclusions* section of this permit. Pursuant to the policy, where a new or increased discharge is proposed, the Department shall determine whether the discharge will result in a significant lowering of existing water quality. Increased discharge means a discharge that would add one or more new pollutants to an existing effluent, increase existing levels of pollutants in an effluent, or cause an effluent to exceed one or more of its current licensed discharge flow or effluent limits, after the application of applicable best practicable treatment technology. As revisions to previous effluent limitations for some pollutants may appear less stringent, the Department is addressing the implications under the anti-degradation policy.

This permitting action revises previously established effluent limitations and monitoring requirements for several pollutants including BOD, TSS, and total phosphorus. The rationale for these actions is contained in Fact Sheet Section 6, *Effluent Limitations & Monitoring Requirements*. Based on the information provided in the referenced section, as well as anticipated improvements in effluent quality over previous facility discharges due to improved wastewater treatment infrastructure and operations, the Department does not consider these actions to result in increased discharges of pollutants and therefore does not consider the anti-degradation policy to be of issue.

9. SETTLING BASIN CLEANING:

Discharge of inadequately treated fish hatchery wastewater (excess feed and fish waste) contributes solids, BOD, and nutrients to receiving waters, which can contribute to eutrophication and oxygen depletion. This, in combination with other pollutant specific toxic effects, impacts the aquatic life and habitat value in the receiving water. Typical hatchery wastewater treatment practices include effluent filtration and settling with solids removal.

The previous licensing action required the licensee to clean its settling basins when accumulated materials occupy 20% of the basin capacity, or prior to this point if the facility is violating its TSS limits. In this permitting action, the Department is requiring that any settling structures be cleaned when accumulated materials occupy 20% of a basin's capacity, when material deposition in any area of the basins exceeds 50% of the operational depth, or at any time that solids from the basins are contributing to a violation of permit effluent limits. The previous action also required the licensee to measure sludge deposits a minimum of once per year during October at four representative locations in each settling structure. In this permitting action, this requirement is being eliminated and measurement of waste deposition left to the discretion and responsibility of MDIFW Palermo.

10. DISEASE AND PATHOGEN CONTROL AND REPORTING:

Maine Department of Inland Fisheries and Wildlife (MDIFW) Rules (Chapter 2.03-A) and Maine Department of Marine Resources (MeDMR) Rules (Chapter 24.21) state that *"the transfer and/or introduction of organisms fall within the jurisdiction of the Department of Marine Resources (12 MRSA, §6071) into coastal waters within the State of Maine and the Department of Inland Fisheries and Wildlife (12 MRSA, §§7011, 7035 and 7201, 7202) into public and/or private waters within the State of Maine. These rules are intended to protect wild and farmed salmonid fish populations and shall be applicable to all individuals involved in the culture and movement of live salmonids and gametes."* Further, both agencies' rules define Diseases of Regulatory Concern as *"...infectious agents that have been demonstrated to cause a significant increase in the risk of mortality among salmonid populations in the State of Maine. Diseases of Regulatory Concern are classified by the Commissioner into three (3) disease categories: exotic, endemic (limited distribution) and endemic based on an annual review and analysis of epidemiological data."* The previous licensing action required the licensee to notify the MEDEP the next business day of any diseases in the fish of regulatory concern. In this permitting action, as a salmonid aquaculture facility, MDIFW Palermo must comply with MDIFW and MeDMR salmonid fish health rules (12 MRSA, §6071; 12 MRSA, §§7011, 7035, 7201, and 7202, or revised rules). The cited rules include requirements for notification to the appropriate agency within 24-hours of pathogen detection. In the event of a catastrophic pathogen occurrence, the permittee shall submit to the Department for review, information on the proposed treatment including materials/chemicals to be used, material/chemical toxicity to aquatic life, the mass and concentrations of materials/chemicals as administered, and the concentrations to be expected in the effluent. The Department will address such occurrences through administrative modifications of the permit.

Based on concerns of the potential for disease transmission from the MDIFW Palermo facility to the Sheepscot River and impacts to Atlantic salmon contained therein outlined in Fact Sheet Section 21, this permitting action requires that, on or before June 1, 2006, the permittee shall submit to the Department for review and approval, a scope of work for development of Biosecurity and Disease Contingency Plans. The scope of work shall generally identify rules/requirements, operational practices and procedures to be identified and/or developed to insure the significant reduction in, or elimination of, the threat of disease transmission from MDIFW Palermo to the Sheepscot River. The scope of work shall, at a minimum, identify opportunities for disease transmission and introductions of new pathogens, identify and provide for closure of any gaps left by the "Maine Fish Health Rules" especially related to initial steps for managing outbreaks of diseases of concern, address practices for handling affected fish, and methods for the isolation, containment, and treatment of contaminated water prior to its disposal or discharge to the receiving water. On or before March 1, 2007, the permittee shall submit to the Department for review and approval, a final Biosecurity and Disease Contingency Plan that addresses items/issues contained in the Department approved Scope of Work and insures the significant reduction in, or elimination of, the threat of disease transmission from MDIFW Palermo to the Sheepscot River.

11. THERAPEUTIC AGENTS:

In the June 30, 2004 final NEGs, EPA requires proper storage of drugs, pesticides and feed and requires facilities to report use of any investigational new animal drug (INAD), extra-label drug use, and spills of drugs, pesticides or feed that results in a discharge to waters of the U.S.

The previous licensing action required that all medicated fish feeds, drugs, and other fish health therapeutants shall be approved by the US Food and Drug Administration (USFDA) and applied according to USFDA acceptable guidelines. Further, records of all such materials used were to be maintained at the facility for five years. The Department is carrying forward these requirements in this permitting action with modifications that therapeutants be applied according to USFDA accepted guidelines and manufacturer's label instructions and that therapeutic agents must also be registered with USEPA, as appropriate.

This permitting action does not authorize routine off-label or extra-label drug use. Such uses shall only be permitted in emergency situations when they are the only feasible treatments available and only under the authority of a veterinarian. The permittee shall notify the Department in writing within 24-hours of such use. This notification must be provided by the veterinarian involved and must include the agent(s) used, the concentration and mass applied, a description of how the use constitutes off-label or extra-label use, the necessity for the use in terms of the condition to be treated and the inability to utilize accepted drugs or approved methods, the duration of the use, the likely need of repeat treatments, and information on aquatic toxicity. If, upon review of information regarding the use of a drug pursuant to this section, the Department determines that significant adverse effects are likely to occur, it may restrict or limit such use.

This permitting action does not authorize the discharge of drugs authorized by the USFDA pursuant to the Investigational New Animal Drug (INAD) program. As the INAD program typically involves the long-term study of drugs, their benefits and effects, the permittee is anticipated to be able to notify the Department of its intent to conduct, and provide information related to, such study. The permittee is required to provide notification to the Department for review and approval prior to the use and discharge of any drug pursuant to the INAD program. This notification must include information to demonstrate that the minimum amount of drug necessary to evaluate its safety, efficacy, and possible environmental impacts will be used. Notifications must also include an environmental monitoring and evaluation program that at a minimum describes sampling strategies, analytical procedures, evaluation techniques and a timetable for completion of the program. The program must consider the possible effects on the water column, benthic conditions and organisms in or uses of the surrounding waters. Review and approval of INAD related uses and discharges will be addressed through administrative modifications of the permit.

Formaldehyde: The previous licensing action established a requirement stating, "*at no time shall the discharge of Formaldehyde exceed 5 milligrams per liter*". The discharge of formaldehyde is addressed in Fact Sheet Section 6f, EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS, Formalin, above. The Department is requiring MDIFW Palermo to continue to report therapeutic agents used at the facility that have the potential to be discharged to the receiving water.

Other Materials: MDIFW Palermo reports using no other therapeutic or medicinal agents.

12. DISINFECTING/SANITIZING AGENTS:

The previous licensing action required the licensee to submit a list of all sanitizing agents and/or disinfectants used on rearing equipment, their concentrations as used and concentrations and masses at the point of discharge. Further, the previous licensing action required that at no time shall the concentration of chlorine in the receiving water exceed 11 parts per billion (ppb) for chronic and/or 19 ppb for acute toxicity concerns. Also, all footbath wastes were required to be disposed of by approved methods and not into the hatchery waste stream or receiving waters.

MDIFW Palermo reports that no chlorine based products are used at the facility in such a way that they will enter the waste-stream or receiving water. Therefore, this permitting action eliminates previously established effluent limitations for chlorine. MDIFW Palermo reports that it uses a hard surface disinfectant ("T.B.Q.") for equipment and vehicle disinfection, but that no disinfectants enter the waste-stream or receiving water. MDIFW Palermo further reports that it will be using an iodine based product for footbath disinfection, but that all footbath wastes will be properly disposed of and will not enter the waste-stream or receiving water.

This permitting action requires MDIFW Palermo to maintain records of all sanitizing agents and/or disinfectants used that have the potential to enter the waste-stream or receiving water, their volumes and concentrations as used and concentrations at the point of discharge, at the facility for a period of five years. This permitting action only authorizes the discharge of those materials applied for, evaluated by the Department, and either regulated or determined to be deminimus in this permitting action or in subsequent Department actions. The discharges of any other agents or waste products not specifically included in this permitting action are considered unauthorized discharges pursuant to Permit Special Condition C.

13. MINIMUM TREATMENT TECHNOLOGY REQUIREMENT:

Between 2000 and 2002, eleven Maine fish hatcheries were evaluated to identify potential options for facility upgrades. All nine Maine Department of Inland Fisheries and Wildlife hatcheries were evaluated by FishPro Inc., while the two USFWS hatcheries were evaluated by the Freshwater Institute. Recommended wastewater treatment upgrades for each of the facilities included microscreen filtration of the effluent. Based on the information provided and Department BPJ, the Department is specifying that minimum treatment technology for the Palermo facility shall consist of treatment equal to or better than 60-micron microscreen filtration of the effluent, wastewater settling/clarification, removal of solids. MDIFW Palermo shall provide treatment equal to or better than the BPJ minimum treatment technology and shall comply with all effluent limitations, monitoring requirements, and operational requirements established in this permitting action. Additional treatment may be necessary to achieve specific water quality based limitations.

It is the Department's intent to evaluate effluent data and potentially revise technology based effluent limits in the future based on statistical evaluations of demonstrated performance of consistently and properly utilized treatment technology. The Department reserves the right to reopen facility discharge permits to establish these limits.

14. AMBIENT MACROINVERTEBRATE BIOMONITORING:

Based on available data, the Department is concerned with the effects of fish hatchery effluent discharges on rivers and streams in Maine and specifically the Sheepscot River. As macroinvertebrate communities provide indications of the overall ecological health of a receiving water, the Department has determined that biomonitoring is needed to better evaluate attainment of river and stream water classification standards and designated uses, resource impacts, and corrective measures when necessary. In order to address this need, the Department's Division of Environmental Assessment (MEDEP DEA) will conduct macroinvertebrate biomonitoring in the receiving water in 2006 to determine attainment of the aquatic life standards following upgrade of the MDIFW Palermo facility. This permitting action requires MDIFW Palermo to conduct ambient macroinvertebrate biomonitoring annually beginning calendar year 2007. On or before March 1, 2007, MDIFW Palermo shall submit a biomonitoring plan for the Sheepscot River to MEDEP DEA for review and approval. The plan shall be consistent with "*Methods for Biological Sampling and Analysis*

of Maine's Rivers and Streams" (DEP #LW0387-B2002, August 2002) and shall include a scope of work and schedule, monitoring locations and maps, methods and materials, and reporting procedures for the biomonitoring program. Biomonitoring shall be conducted according to a Department approved monitoring plan. Results shall be reported to the Department in a biomonitoring report by December 15 each year. If the receiving water is determined by the Department to be meeting criteria, standards, and designated uses for its assigned water quality class, including following the 2006 monitoring, the Department will reopen the permit pursuant to Permit Special Condition P, to modify or discontinue the biomonitoring requirement.

15. AMBIENT DISSOLVED OXYGEN AND TEMPERATURE MONITORING:

The previous licensing action required the licensee to monitor dissolved oxygen, BOD, TSS, and total phosphorus in the Sheepscot River at locations upstream and downstream of the outfall. Monitoring was required to be conducted in the mornings and afternoons between July 1 and September 30, 2000, and was designated as Outfalls #011A, #012A, #011P, and #012P. The intent of this requirement was to "*better quantify the characteristics of the hatchery effluent, the effectiveness of the various stages of treatment, and to determine effects on water quality...*".

Based on the low effluent dilution provided in the receiving water and the need for additional data on the effects of the MDIFW Palermo's effluent on the water quality of its receiving water, this permitting action requires the permittee to seasonally monitor ambient dissolved oxygen and temperature levels in the Sheepscot River. The permittee shall monitor ambient dissolved oxygen and temperature (Celsius) from June 1 through September 30 each year beginning the effective date of this permit at a frequency of once per week and shall report the time of day the monitoring is conducted. The permittee shall report all monitoring results to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report. Monitoring shall be conducted within two hours of sunrise, or as indicated in a Department approved monitoring plan, at two locations: (1) between the Sheepscot Lake dam and the head of the MDIFW Palermo facility in an area representing free-flowing conditions and (2) below the MDIFW Palermo outfalls in an area representing the dissolved oxygen sag point, unless revised by the Department. The permittee shall also report on the composition of river flow between the dam and the head of the facility. The permittee shall specify if river flow results from flow over the dam and provide the estimated depth of that overflow, or only leakage through the dam and provide the length of time that condition persists in days. On or before three months following the effective date of this permit, MDIFW Palermo shall submit a plan for ambient dissolved oxygen and temperature monitoring and instrument calibration/data quality control to the Department's Division of Environmental Assessment for review and approval. The plan shall include a scope of work and schedule, monitoring locations and maps, sampling methods and materials, and reporting procedures for the ambient dissolved oxygen and temperature monitoring program. The plan shall also include procedures for regular instrument calibration to ensure data quality control. Ambient dissolved oxygen and temperature monitoring shall be conducted according to a Department approved monitoring plan.

16. SALMON GENETIC INTEGRITY AND HATCHERY ESCAPE PREVENTION:

The US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) formally listed the Atlantic salmon as an endangered species on November 17, 2000. Two significant issues of concern regarding the rearing of salmon in Maine involve the genetic integrity of the salmon and escape prevention to avoid impacts on native fish.

On December 4, 2000, in regard to the Department's pending delegation to administer the NPDES Permit Program, USEPA Region I informed the Department that "*permits issued to freshwater hatcheries raising salmon will require that the facility be designed or modified to achieve zero escapement of fish from the facility*". The EPA also stated, "*The information contained in the* (US Fish and Wildlife and NOAA Fisheries) *Services' listing documents indicates that a remnant population of wild Atlantic salmon is present in...*" Maine waters "*...and that salmon fish farms and hatcheries are activities having a significant impact on the...*" Gulf of Maine Distinct Population Segment of Atlantic salmon (DPS) "*...through, among other things, the escape of farmed and non-North American strains of salmon which may interbreed with the wild Maine strains, compete for habitat, disrupt native salmon redds, and spread disease.*" "*Based on this information, the Services have concluded that the escape of farm-raised salmon from fish farms and hatcheries is likely to significantly impair the growth, reproduction and habitat of wild salmon, thereby impairing the viability of the DPS.*" "*EPA has analyzed current information, including these findings, and based on this information believes that this remnant population constitutes an existing instream use of certain Gulf of Maine rivers and considers that the above-described impacts to the population would be inconsistent with Maine's water quality standards. Assuming the information discussed above does not significantly change, EPA will utilize its authorities to ensure compliance with Maine water quality standards by ensuring that conditions to protect the remnant population of Atlantic salmon are included in NPDES permits for salmon fish farms and hatcheries, which are subject to regulation as concentrated aquatic animal production facilities.*" "*In view of the substantial danger of extinction to the DPS described by the Services, it is EPA's view that proposed permits authorizing activities that would adversely affect the population, as described earlier in this letter, would be inconsistent with Maine's water quality standards and objectionable under the CWA.*"

Leading up to the listing and in subsequent draft MEPDES Permit / Maine WDL reviews, the USFWS and NOAA Fisheries have advocated for genetic testing of Atlantic salmon housed at hatchery and rearing facilities to ensure that they are of North American origin, as well as employment of a fully functional Containment Management System (CMS) at facilities to prevent the escape of raised salmon or other species of concern in order to avoid impacts on native fish populations. These issues are of particular concern for the Gulf of Maine DPS. MDIFW Palermo discharges its effluent to the Sheepscot River, which is within the Gulf of Maine DPS and is one of eight rivers known to contain endangered Atlantic salmon.

MDIFW Palermo is a state brook trout and brown trout rearing facility that produces fish for stocking in Maine waters as part of MDIFW's responsibilities in managing fisheries.

MDIFW Palermo does not raise salmon and thus is not subject to genetic testing requirements. However, despite an active brown trout fishery and former stocking program in this water, the rearing of brown trout in the Sheepscot River is of concern to USFWS and NOAA Fisheries.

The USFWS reports, "*The escape of brown trout into the Sheepscot River is a very serious threat to native Atlantic salmon populations and would result in a take of salmon, which is illegal under the federal Endangered Species Act. The draft Recovery Plan for Atlantic Salmon identified the introduction of non-native fish species, including brown trout, as a high level threat to salmon and a highest priority for action to address the threat.*" NOAA Fisheries reports, "*Brown trout are known to impact Atlantic salmon through several mechanisms including:* (1) *Predation - Brown trout predation has been implicated in the decline of several native salmonid populations in North America. In Maine, brown trout have been documented consuming large numbers of stocked Atlantic salmon fry.* (2) *Competition for habitat - Most evidence suggests that brown trout will displace or otherwise outcompete Atlantic salmon from pool habitats in both summer and winter.* (3) *Redd superimposition - Brown trout and Atlantic salmon demonstrate similar spawning site preferences and spawn at about the same time in the fall. Evidence also suggests that brown trout females may prefer to spawn on existing redd sites.* (4) *Competition for food - It is expected that juvenile salmon and trout would compete for similar food items in the river.* (5) *Genetic impacts - Brown trout are capable of hybridizing with other salmonids. Studies in Sweden have documented brown trout/Atlantic salmon hybrids. Hybridization was also documented in the Connecticut River.*"

Escapement: MDIFW Palermo reports that the upgraded facility employs effluent screens at the ends of both lines of raceways, which serve to block fish from entering both the facility wastewater treatment infrastructure and the emergency outfall (Outfall #006A). Further, the facility drum filter and associated wing walls provide fish escape prevention. All screens are sized according to the size of the fish and are inspected regularly. Any escapees would have to elude these measures to enter the receiving water.

Based on requirements established in Maine's Aquaculture General Permit (#MEG130000, Part II, Section I), individual MEPDES Permits for marine aquaculture facilities, and guidance developed by the Maine Aquaculture Association, in this permitting action, the Department requires that the permittee shall employ a fully functional Containment Management System (CMS) at the facility designed, constructed, and operated so as to prevent the accidental or consequential escape of fish to open water. The CMS plan shall include a site plan or schematic with specifications of the particular system. The permittee shall develop and utilize a CMS consisting of management and auditing methods to describe or address the following: site plan description, inventory control procedures, predator control procedures, escape response procedures, unusual event management, severe weather procedures and training. The CMS shall contain a facility specific list of critical control points (CCP) where escapes have been determined to potentially occur. Each CCP must address the following: the specific location, control mechanisms, critical limits, monitoring procedures, appropriate corrective actions, verification procedures that define adequate CCP monitoring, and a defined record keeping system. The permittee shall submit the CMS plan

to the Department for review and approval on or before six months following the effective date of this permit.

The CMS site specific plan shall describe the use of effective containment barriers appropriate to the life history of the fish. The facility shall have in place both a three-barrier system for fish up to 5 grams in size and a two barrier system for fish 5 grams in size or larger. The three-barrier system shall include one barrier at the incubation/rearing unit, one barrier at the effluent from the hatch house/fry rearing area and a third barrier placed inline with the entire effluent from the facility. Each barrier shall be appropriate to the size of fish being contained. The two-barrier system shall include one barrier at the individual rearing unit drain and one barrier inline with the total effluent from the facility. Each barrier shall be appropriate to the size of fish being contained. Barriers installed in the system may be of the screen type or some other similarly effective device used to contain fish of a specific size in a designated area. Barriers installed in the system for compliance with these requirements shall be monitored daily. Additional requirements include:

1. The CMS shall be audited at least once per year and within 30 days of a reportable escape (more than 50 fish) by a party other than the facility operator or owner qualified to conduct such audits and approved by the Department. A written report of these audits shall be provided to the facility and the Department for review and approval within 30 days of the audit being conducted. If deficiencies are identified during the audit, the report shall contain a corrective action plan, including a timetable for implementation and re-auditing to verify deficiencies are addressed. Additional third party audits to verify correction of deficiencies shall be conducted in accordance with the corrective action plan or upon request of the Department. The facility shall notify the Department upon completion of corrective actions.

2. Facility personnel responsible for routine operation shall be properly trained and qualified to implement the CMS. Prior to any containment system assessment associated with this permit, the permittee shall provide to the Department documentation of the employee's or contractor's demonstrated capabilities to conduct such work.

3. The permittee shall maintain complete records, logs, reports of internal and third party audits and documents related to the CMS on site for a period of 5 years.

4. For new facilities, a CMS shall be prepared and submitted to the Department for review and approval prior to fish being introduced into the facility.

The facility shall report any known or suspected escapes of more than 50 fish within 24 hours to the Maine Atlantic Salmon Commission at 207-287-9973 or 287-9972 (Pat Keliher), Maine Department of Inland Fisheries and Wildlife at 207-287-5202 (Commissioner's office), USFWS Maine Field Office at 207-827-5938, and NOAA Fisheries Maine Office at 207-866-7379.

17. SAMPLE CALCULATIONS FOR EFFLUENT FORMALIN

To calculate the effluent formalin concentration, the permittee shall utilize the concentration administered, the volume of water to which the formalin is added, and dilutions provided from administration to end-of-pipe. Parts per million (ppm) and milligrams per liter (mg/L) are equivalent measurements. The Department's method of calculating effluent formalin levels at the MDIFW Palermo facility are contained in Fact Sheet Section 6.f. The following are examples of alternate methods to calculate effluent formalin levels.

For egg treatments, this example involves administration of 1,720 ppm of formalin for 15 minutes in flow-through water. It assumes a rate of water through the egg trays of 150 gallons per minute times the 15-minute treatment period yielding 2,250 gallons of initial wastewater. The total facility wastewater flow during the same 15-minute period can be calculated by taking a current discharge flow of 8,300 gpm times 15 minutes yielding 124,500 gallons. The formalin would receive an initial dilution of 124,500 gal. / 2,250 gal = 55.3:1. The 124,500 gallons of wastewater flows to the facility settling ponds, which have a total capacity of 969,000 gallons. The formalin would receive a second dilution of 969,000 gal/124,500 gal = 7.8:1. The end of pipe concentration can be calculated as follows:

1,720 ppm formalin / 55.3 / 7.8 = 4 ppm formalin discharged

For external parasite treatments on fish, the example facility administers formalin at a dose of 225 ppm. In this example, two 7,700 gallon pools are treated simultaneously (15,400 gal). The volumes of the two pools are gradually exchanged with fresh water and discharged into the 8,300 gpm facility waste stream over 112 minutes providing an initial dilution. The facility wastewater flows to the settling ponds, which provide a small second dilution. The effluent concentration can be calculated as follows:

8,300 gpm x 112 minutes = 929,600 gal facility wastewater during pool discharge
929,600 gal facility wastewater / 15,400 gal pool volume = 60.3:1 initial dilution
969,000 gal settling pond / 929,600 gal facility wastewater = 1.04:1 second dilution
225 ppm formalin / 60.3 / 1.04 = 3.6 ppm formalin discharged

For broodstock external parasite treatments, the example facility administers formalin to new broodstock fish at a dose of 25 ppm in flow-through water. This example assumes a flow through rate of 80 gpm times a treatment period of 6-hours (360 minutes) per day yielding 28,800 gallons of initial wastewater. The wastewater then flows to the 969,000 gallon capacity settling ponds. The effluent concentration can be calculated as follows:

969,000 gal settling pond / 28,800 gal. waste stream = 33.6:1 dilution
25 ppm formalin / 33.6 = 0.74 ppm formalin discharged

The effluent mass shall be calculated by multiplying the actual gallons of formalin used at the facility in a 24-hour period by a 9.13 lbs/gallon conversion factor based on the specific gravity of formalin. The conversion factor is derived by multiplying the weight of water

(8.34 lbs/gal) times the specific gravity of formalin as compared to water (1.095). If a facility administers 1.04 gallons of formalin in a day, the formalin mass can be calculated as follows:

1.04 gal formalin x 9.13 lbs/gallon = 9.5 lbs formalin discharged

In these examples, the various types of formalin treatments are not administered or discharged at the same time. If multiple discharges of formalin were to occur simultaneously, the facility would have to consider the cumulative formalin concentration and mass. These examples illustrate end-of-pipe (EOP) concentrations, which would be further diluted depending upon the facility's effluent dilution in the receiving water. If a facility receives a 3:1 effluent dilution in the receiving water, the calculated EOP concentration should be divided by three to provide the concentration in the receiving water after mixing.

18. DISCHARGE IMPACT ON RECEIVING WATER QUALITY:

As permitted, the Department has determined the existing water uses will be maintained and protected and the discharge will not cause or contribute to the failure of the Sheepscot River to meet standards for Class B classification or Long Pond to meet the standards for its GPA classification. In response to concerns with effects of fish hatchery effluent discharges on rivers and streams in Maine and limited available data, as outlined in Permit Special Condition M and Fact Sheet Section 14, MDIFW Palermo is required to conduct ambient macroinvertebrate biomonitoring during the term of this permit. MDIFW Palermo is also required to conduct ambient monitoring for dissolved oxygen and temperature, as specified in Permit Special Condition N and Fact Sheet Section 15. Data collected will be used to evaluate attainment of water classification standards and designated uses, resource impacts, and corrective measures when necessary.

If monitoring conducted pursuant to this permitting action and/or the TMDL analysis noted in Fact Sheet Section 5 indicate that non-attainment conditions persist in the receiving water(s) and that MDIFW Palermo causes or contributes to those conditions, this permitting action may be reopened pursuant to Permit Special Condition P and effluent limitations, monitoring and operational requirements, and/or wastewater treatment requirements adjusted accordingly.

19. PUBLIC COMMENTS:

Public notice of this application was made in the Kennebec Journal newspaper on or about June 30, 2005. The Department receives public comments on an application until the date a final agency action is taken on that application. Those persons receiving copies of draft permits shall have at least 30 days in which to submit comments on the draft or to request a public hearing, pursuant to Chapter 522 of the Department's rules.

20. DEPARTMENT CONTACTS:

Additional information concerning this permitting action may be obtained from and written comments should be sent to:

Robert D. Stratton
Division of Water Quality Management
Bureau of Land and Water Quality
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

Telephone: (207) 287-6114
Fax: (207) 287-7826
email: Robert.D.Stratton@maine.gov

21. RESPONSE TO COMMENTS:

During the period of December 13, 2005 through January 17, 2006, the Department solicited comments on the proposed draft MEPDES Permit to be issued to the MDIFW Palermo Fish Rearing Station for the discharge of fish hatchery wastewater to the Sheepscot River in Palermo, Maine. On January 17, 2006, the U.S. Fish and Wildlife Service (USFWS) submitted a letter by facsimile commenting on the proposed draft permit. USFWS' comments and the Department's responses are summarized below. During the period of February 9, 2006 through February 17, 2006, the Department solicited comments on a final draft MEPDES permit. The Department did not receive any comments that resulted in significant revisions to the permit.

Comment 1: Permit Special Condition M, Fact Sheet Section 14, Ambient Macroinvertebrate Biomonitoring. USFWS recommends that USFWS and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) be involved with the review and approval of the required macroinvertebrate sampling plan to ensure that the capture of Atlantic salmon is avoided.

Response 1: During 2006, macroinvertebrate biomonitoring in the Sheepscot River will be conducted by the Department's Division of Environmental Assessment (MEDEP DEA) to determine attainment of the aquatic life standards following upgrade of the MDIFW Palermo facility. MEDEP DEA has developed "*Methods for Biological Sampling and Analysis of Maine's Rivers and Streams*" (DEP Publication #LW0387-B2002, August 2002) and is nationally recognized for their work in this area. If further biomonitoring is required in subsequent years, it will be conducted by the permittee pursuant to MEDEP DEA's above cited methods guidelines. In that case, MEDEP DEA staff will review and approve the biomonitoring plan and review the monitoring results. MEDEP DEA staff does not anticipate capture of juvenile Atlantic salmon in biomonitoring rock baskets due to the physical properties and dynamics of the Sheepscot River in the likely monitoring area and based upon their extensive experience. Nonetheless, it is the Department's desire to avoid or minimize potential impacts to Atlantic salmon. NOAA Fisheries / USFWS are welcome to review the macroinvertebrate biomonitoring plan and provide comments to MEDEP DEA to support this goal. However, the plan review and approval will be conducted by MEDEP DEA, as the Department can not delegate its approval authority to another agency.

Comment 2: Permit Special Condition O, Fact Sheet Section 16, Salmon Genetic Testing and Escape Prevention. USFWS comments, "(b)*ecause the release of brown trout into the Sheepscot River could have adverse impacts to wild salmon in the Gulf of Maine DPS through predation, competition for habitat, and redd superimposition, the Services* (USFWS, NOAA Fisheries) *should be involved with the review and approval of the applicant's CMS. As you know, the Services have been involved with the aquaculture industry and various state and federal agencies in the development of templates for containment plans for both marine and freshwater hatchery facilities used in Maine. The Services should participate, along with the Department, in the review and approval of all required audit reports and any necessary corrective action plans*".

Response 2: The federal agencies were involved with development of CMS standards as industry standards and as requirements in the Department's Aquaculture General Permit. Those General Permit CMS standards are the basis for CMS requirements established in this permitting action. The federal agencies are not involved in the review and approval of facility CMS plans, audit reports, or any necessary corrective action plans pursuant to a facility's coverage under the Aquaculture General Permit. Nonetheless, based on USFWS and NOAA Fisheries specific concerns with the Sheepscot River as a DPS water, the two agencies are welcome to review these materials and comment to the Department. However, as with Aquaculture General Permits, the review and approval of CMS plans, audit reports, and any necessary corrective action plans for individual hatchery permits will be conducted by a Department facility inspector.

Comment 3: Fact Sheet Section 2d, Source Description/Facility Operation. USFWS comments, "*...the hatchery obtains water for the facility from two intake pipes (24" and 16" pipes) in Sheepscot Lake. The deep water 24-inch pipe is fitted with a coarse screen while the shallow 16" pipe is not screened. The Services recommend that these intake pipes be designed to avoid the intake of wild Atlantic salmon of any size from Sheepscot Lake into the hatchery The Services have developed design criteria for screening intakes to protect salmonids. The Services are willing to work with the Department and the applicant to design appropriate intake structures for this hatchery according to these criteria.*" "*The applicant does not have authorization to take Atlantic salmon through entrainment in their hatchery intake system*".

Response 3: The Department appreciates USFWS' and NOAA Fisheries' experience in this area and their offer outlined above. The Department also understands the implications of salmon entrainment. However, the Department has no authority to regulate intake structures for this type of facility under the Clean Water Act and thus views this endeavor as separate from the MEPDES permit. The Department encourages MDIFW to work with USFWS and NOAA Fisheries to design appropriate intake structures for this facility and to address their concerns pursuant to the Endangered Species Act.

Comment 4: Fact Sheet Section 6b, Dilution Factors. USFWS comments that, as stated in the Fact Sheet (Section 2d, Influent Water), the Sheepscot River between the Sheepscot Lake Dam and the head of the Palermo Rearing Station (approximately 800 feet) "*...has been completely dewatered at times due to operation of the Palermo Rearing Station and the Sheepscot Lake Dam (also owned by the Applicant)". We question whether the required dilution can be achieved under such conditions. It also would appear that the dewatering would violate state and federal water quality standards, due to the inability to provide for existing and designated uses (i.e., maintenance of salmon habitat). Furthermore, because this section of the Sheepscot River is mapped as providing habitat for listed Atlantic salmon, dewatering the section below the dam would likely result in a take of Atlantic salmon. This is a violation of the ESA. Although this may not fall under the specific requirements of this discharge permit, the state is encouraged to develop a plan to provide an adequate minimum flow for this portion of the river. The Services are willing to assist the state in developing this plan*".

Response 4: For the purpose of clarification, the permittee is not required to achieve a certain dilution to comply with permit limits. Effluent limits are specifically developed and must be complied with, whereas dilution factors are defined based on potential discharge conditions and used as a tool in calculating certain effluent limits. Some effluent limits contained in the permit are based on the Department's best professional judgement (BPJ) of best practicable treatment (BPT), applicable for all facilities in this industry, while others are based on previous license limits due to receiving water limitations. The phosphorus mass limit is water quality based and site specific, pursuant to the sensitivity of Long Pond located down-river of the facility. The phosphorus and formalin concentration limits are also site specific - water quality based and, to ensure the protection of the receiving water, its aquatic life, and designated uses during all potential discharge scenarios, are calculated based on the potential dilution afforded by the receiving water under low flow conditions. In determining this, the Department considered the potential dewatering of the river from natural conditions and operation of the dam. "*Based on this information, the Department must assume a seasonal low flow of 0 cubic feet per second in the Sheepscot River and acute (1Q10), chronic (7Q10) and harmonic mean dilution factors of 1:1, representative of the fact that the MDIFW Palermo discharge sometimes constitutes the only river flow. If MDIFW wishes to establish a guaranteed minimum flow from the Sheepscot Lake dam in the future, this determination may be revisited*". The Department established a minimum effluent dissolved oxygen limit, monitoring requirements for effluent dissolved oxygen, ambient water quality monitoring requirements, and annual ambient macroinvertebrate biomonitoring requirements. However, the Department acknowledges that this largely addresses the river below the facility outfall and not the portion between the dam and the head of the facility. The ambient water quality monitoring and macroinvertebrate biomonitoring requirements however, include establishment of monitoring sites upstream of the facility. This situation is of concern to the Department, but not within the purview of a MEPDES Permit / Maine WDL. Separately, the Department is developing rules to address water withdrawl practices and minimum ambient base flows in Maine. The stakeholder group assembled for this rulemaking effort includes state and federal agencies and interested parties, including USFWS, NOAA Fisheries, and MDIFW. The Department has conveyed to MDIFW that adoption of such rules will likely affect its operation.

Regarding potential corrective actions to the described conditions, MDIFW comments, "*...it would be counter productive to use surface water discharge through the dam to wet the river with water above the temperature tolerance of salmon. If water levels decrease in that stretch of the river and fish are forced to drop down the river, they will be rewarded by entering a cool water refuge provided by the hatchery discharge. If warm surface lake water is added to the river during the summer to wet the stream, then this warm water will drive salmon from that stretch of the river and increase the mean temperature of the water below the hatchery's discharge as well.*" The Department believes that ongoing discussion of this situation and potential corrective actions is warranted and anticipates the above referenced rulemaking effort and stakeholder process to be a viable mechanism.

Comment 5: Permit Special Condition I, Fact Sheet Section 10, Disease and Pathogen Control and Reporting. USFWS notes that pathogens entering hatcheries from untreated surface waters can be amplified and discharged to receiving waters. USFWS further notes that neither influent nor effluent waters are disinfected for disease prevention at MDIFW Palermo. Although this condition is not uncommon for fish hatcheries and rearing facilities, USFWS comments that in the case of MDIFW Palermo, it is possible for diseases to be transmitted from the facility to endangered Atlantic salmon known to be present in the Sheepscot River. To reduce or eliminate the threat of disease transmission, USFWS recommends "*...that the Applicant be required to develop a Biosecurity plan that identifies possible vectors for introducing new pathogens into the hatchery and reduces or eliminates these, as well as any operational measures that could be done to minimize the risk of disease transmission to the wild or receiving water.*"

Because MDIFW Palermo is located on a river containing endangered salmon, USFWS also recommends that MDIFW prepare a Disease Contingency Plan for use in the event of a disease outbreak. USFWS recommends that, at a minimum, the contingency plan include general first steps for managing outbreaks of diseases of concern and address treatment of effluent waters. USFWS points out that the "*Maine Fish Health Rules* (see Permit Special Condition I and Fact Sheet Section 10) *require a disease management plan be provided to the Commissioner...*" of the appropriate state natural resource agency (Department of Marine Resources or Inland Fisheries and Wildlife) "*...within 24 hrs of confirmation of an exotic pathogen. Although an exotic pathogen outbreak at this facility may be unlikely, it would be beneficial to have in place a general contingency plan that aids workers in identifying initial steps for dealing with pathogens of concern.*" USFWS recommends that the Disease Contingency Plan be developed in consultation with USFWS and NOAA Fisheries.

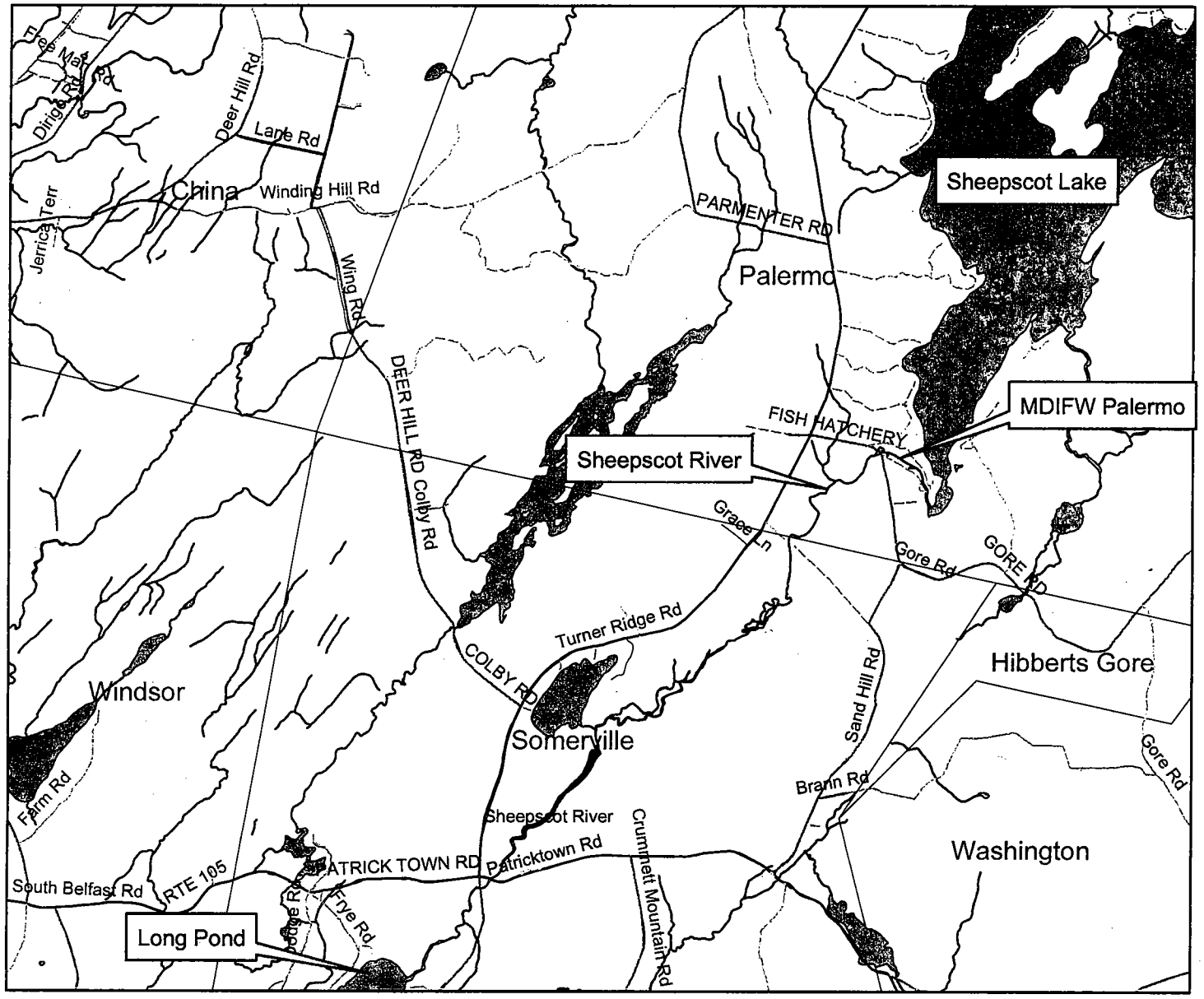
Response 5: MDIFW responds, "*As part of our development of a comprehensive standard operating manual for the Palermo Fish Rearing facility, we will incorporate...*" USFWS' "*...suggestions for written biosecurity plan, continued education on biosecurity by hatchery personnel, and notification of ASC, NOAA, and USFWS of any detection of a pathogen of regulatory concern*". "*We will continue to only transport fish into the Palermo facility that have been tested and are negative of all pathogens of regulatory concern. Fish leaving the*

facility will continue to be tested prior to stocking. The buildings that cover the raceways are currently completely enclosed with wood and wire mesh. These buildings are maintained to prevent the entry of piscivorous animals". "Trout and salmon stocked into Sheepscot Lake will continue to come only from lots tested and negative for pathogens of regulatory concern. IFW has periodically examined wild and stocked fish from the Sheepscot Lake for pathogens. Although no major renovations are planned for the Palermo Fish Rearing facility, should IFW consider making a major renovation, we would include considerations for improving the facilities biosecurity such as disinfection of incoming and/or outgoing water."

The Department believes that many of USFWS' concerns may be substantially addressed in the "Maine Fish Health Rules", practices already undertaken by MDIFW, and in practices proposed by MDIFW above. However, given the significance of these issues for MDIFW Palermo, the Sheepscot River, and Atlantic salmon contained therein, this permitting action is establishing a requirement for development of Biosecurity and Disease Contingency Plans to bring together the various requirements, operational practices and procedures to formally address concerns about biosecurity and disease transmission. As established in Permit Special Condition I and Fact Sheet Section 10 (Disease and Pathogen Control and Reporting), the permittee shall prepare and submit for review and approval, a scope of work for plan development followed by submittal, review, and approval of a final Biosecurity and Disease Contingency Plan. The Department invites USFWS and NOAA Fisheries to participate in the review of these documents and encourages MDIFW to communicate with them as it plans for and develops the Biosecurity and Disease Contingency Plans. Approval of the scope of work and the Biosecurity and Disease Contingency Plan shall be the responsibility of the Department.

ATTACHMENT A

(Facility Location Maps)



Legend

Rivers

- AA
- A
- B
- C

Streams

- AA
- A
- B
- C
- Ponds and Lakes
- Wastewater_Facilities
- Wastewater_Outfalls

Roads

JURISDICTION

- Town Road
- Town Road - Summer
- Town Road - Winter
- State-aided Highway
- State Highway
- Toll Highway
- Private Road
- Reservation Road
- Seasonal Parkway

N

Miles

0 0.25 0.5 1 1.5 2

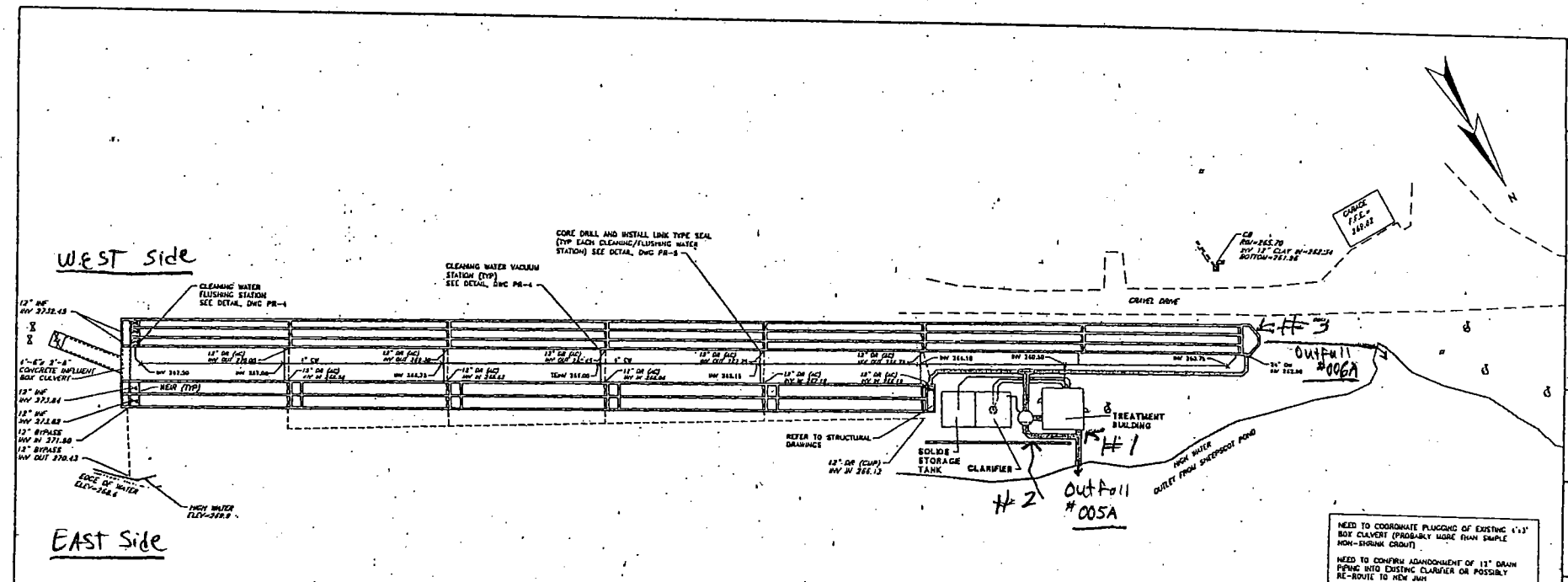
MDIFW Palermo Rearing Station
Palermo, Maine

Map created by:
Bob Stratton
Division of Water Resource Regulation
Maine Department of Environmental Protection

DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF MAINE

ATTACHMENT B

(Facility Site Plans)

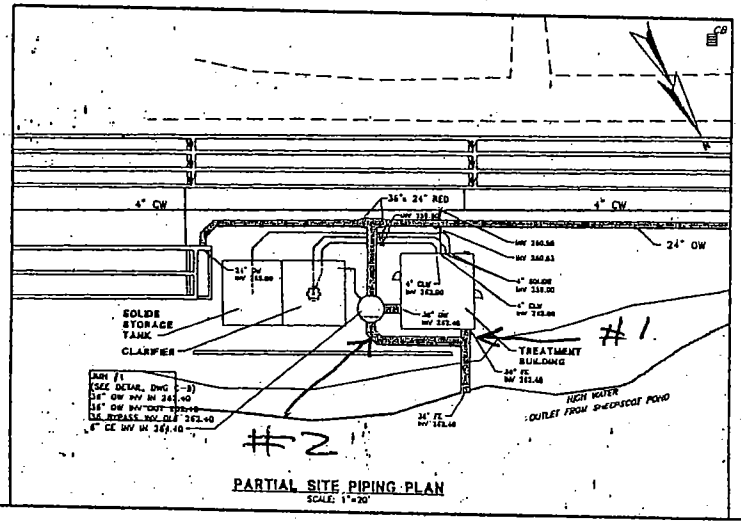


SITE PIPING PLAN
SCALE: 1"=30'

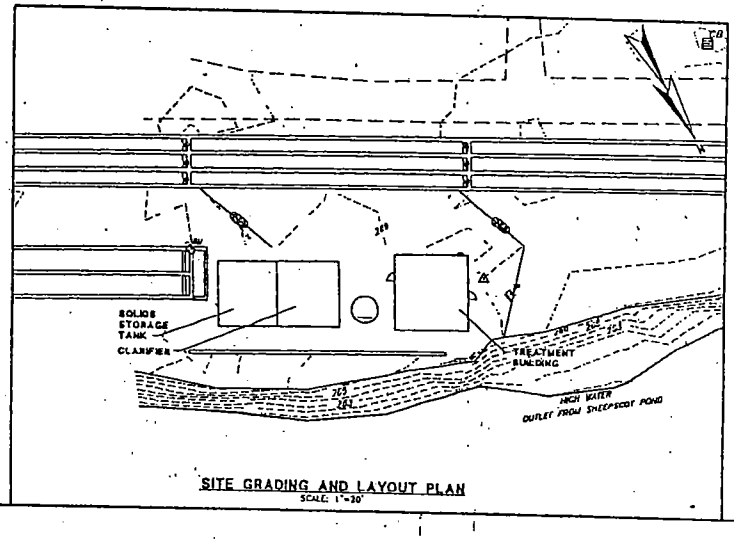
NEED TO COORDINATE PLUGGING OF EXISTING 6'x3' BOX CULVERT (PROBABLY MORE THAN SIMPLE NON-SHRINK GROUT)

NEED TO CONFIRM ABANDONMENT OF 12" DRAIN PIPING INTO EXISTING CLARIFIER OR POSSIBLY RE-ROUTE TO NEW JMH

NEED TO ENSURE WE COORDINATE DEMOLISHED 12" (ASBESTOS) DRAIN PIPING AT NEW RACEWAY DISCHARGE POOL STRUCTURE



PARTIAL SITE PIPING PLAN
SCALE: 1"=20'



SITE GRADING AND LAYOUT PLAN
SCALE: 1"=20'

NO	REVISIONS	DATE	APPD
1			
2			
3			
4			
5			

DRAWN BY
CHECKED BY
DATE
PROJECT BY
DATE
BOOK NO.
PROJECT NO. 2012.52
SCALE

PRELIMS PRINTED
CLIENT FOR REVIEW
CLIENT FOR REPRO

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MAINE DEPT OF INLAND FISHERIES AND WILDLIFE
ENHANCED EFFLUENT TREATMENT SYSTEMS
DANFORTH, ENFIELD, AND PALERMO, MAINE
PALERMO SITE GRADING, LAYOUT AND SITE PIPING PLANS

DWG C-7
OF

ATTACHMENT C

(Engineer's Facilities Planning Report)

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Land and Water Quality
Division of Water Quality Management

INVESTIGATION PROTOCOL

All reports, plans and specifications shall be submitted by the dates specified in the permit. The documents submitted for formal approval shall include the engineer's report, final plans and specifications.

Procurement of Engineering Services.

This step requires retaining an engineering firm to plan, study, and design the project. The owner then hires one or more separate construction contractors to build the project; construction services, including construction management, are performed by the design firm. Start-up and operator instruction services are performed by the design engineer.

Engineer's Facilities Planning Report (Reports Required Pursuant to Permit Special Condition G).

The purpose of the report is to present in clear, concise form a description of the problem, alternative solutions examined, rejected and recommended, their technical and financial feasibility, and their environmental impact. The report should contain a detailed basis of design covering each component of the treatment process. The engineer's report should provide a description of alternative wastewater treatment processes screened for consideration, as well as factors considered in selecting processes. Such factors should include:

Compatibility with existing facilities
Flexibility for expansion
Ability to meet required permit limits
Suitability to handle probable variations in plant loading
Proven effectiveness
Land area requirements
Labor requirements
Construction costs
Operational costs
Energy requirements
Odor potential

System Alternatives: The engineer must carefully consider all feasible designs for the facility. The initial evaluation should focus on the technical appropriateness of all alternatives. Then, those deemed technically appropriate should receive in-depth technical and economic evaluation. The alternatives that should be evaluated include: source reduction through pollution prevention, storage and release to the receiving water as appropriate to reduce toxic amounts, conveyance of the waste to the POTW, pretreatment, conventional treatment and innovative/alternative treatment.

Conclusions, Recommendations, and Proposed Schedules: The engineer's facility planning report should clearly summarize the detailed evaluations contained in the body of the report. Provide a clear description of what is being proposed and propose an implementation schedule for approval. A typical schedule should reflect various future phases of the project such as required approvals, final design, bidding, contract award, construction and start-up. The facility shall be fully operational within the timeframes established in the permit.

Final Design Contract Drawings and Specifications

Plans should consist of general views, specific plan areas, elevations, sections, and details. Together with the specifications, these provide information for the contract and construction of the project. Complete technical specifications for the work should accompany the plans. Technical specifications should be clear and concise. They should include, but are not limited to, all construction information that the builder needs that is not shown on the plans, such as details of the design requirements, including the quality of materials, lists of required manuals, tools, chemicals, spare parts, and calibration equipment.