



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

April 9, 2007

Mr. David Miller
Production Manager
Atlantic Salmon of Maine, LLC
133 Smalls Point Road
Machiasport, Maine 04655

RE: Maine Waste Discharge License (WDL) Application #W009005-5Q-A-N
Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0110507
Final Permit/License
Cross Island - DMR Site ASMI-CI

Dear Mr. Miller:

Enclosed please find a copy of your **final** MEPDES permit/WDL which was approved by the Department of Environmental Protection. You must follow the conditions in the permit 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.*"

Should you have questions regarding this matter, feel free to call me at (207) 287-7693.

Sincerely,

Gregg Wood
Division of Water Quality Management
Bureau of Land and Water Quality

lc.

Matt Young, DEP/EMRO
Jon Lewis, DMR
Sandy Lao, USEPA

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

DEPARTMENT ORDER

IN THE MATTER OF

ATLANTIC SALMON OF MAINE, LLC)	MAINE POLLUTANT DISCHARGE
CULTER, WASHINGTON COUNTY, MAINE)	ELIMINATION SYSTEM PERMIT
AQUACULTURE, CROSS ISLAND)	AND
DMR SITE DESIGNATION #ASMI-CI)	WASTE DISCHARGE LICENSE
ME0110507)	
W009005-5Q-A-N)	
	APPROVAL	NEW

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 all applicable regulations, the Department of Environmental Protection (Department hereinafter) has considered the application of ATLANTIC SALMON OF MAINE, LLC (ASM hereinafter), with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

APPLICATION SUMMARY

ASM has filed an application with the Department for a new combination Maine Pollutant Discharge Elimination System (MEPDES) permit #ME0110507/Maine Waste Discharge License (WDL) #W009005-5Q-A-N for the discharge(s) of wastes associated with the operation of an Atlantic salmon aquaculture facility located off the northwest shore of Cross Island in Cutler, Maine. ASM proposes to operate a facility that is comprised of twenty four (24) polar circles, each measuring 100 meters in circumference, with a stocking density ranging from 20 kg/m³ to 30 kg/m³ and maximum biomass of 3,821,000 kg.

PERMIT SUMMARY

This permitting action establishes:

1. A water column mixing zone extending out 30 meters beyond the perimeter of the net pen.
2. A sediment mixing zone extending out 30 meters beyond the perimeter of the net pen.
3. Seasonal far-field ambient water quality monitoring.
4. Seasonal near-field ambient water quality monitoring.
5. Sediment and benthic monitoring programs.

PERMIT SUMMARY (cont'd)

6. Numeric impact thresholds for sediments and the benthic community.
7. Seasonal Finfish Aquaculture Monitoring Program (FAMP) and routine video and photographic monitoring.
8. A prohibition on the stocking of any Atlantic salmon originating from non-North American stock.
9. Genetic testing to determine North American stocks from non-North American stocks.
10. A compliance schedule to mark stocked fish such that the fish can be identified as being commercially reared, as to which hatchery the fish originated, as to the owner of the fish and as to the individual facility where they were stocked.
11. Best management practices for the operation of the net pens.
12. Certain husbandry practices for the facility operations.
13. Limitations on the use of drugs for disease control.
14. Best management practices for spill control via the development and maintenance of a Spill Prevention Control and Countermeasure (SPCC) plan.
15. Submission of monitoring results to the Department via Discharge Monitoring Report (DMR) forms.

CONCLUSIONS

BASED on the findings in the attached Fact Sheet dated March 5, 2007, 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 M.R.S.A., 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 ATLANTIC SALMON OF MAINE, LLC, to discharge wastes associated with the operation of a finfish aquaculture facility referred to as the Cross Island site located in Machias Bay in Cutler, Maine. The aquaculture facility will be 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 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 10TH DAY OF April 2007.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:

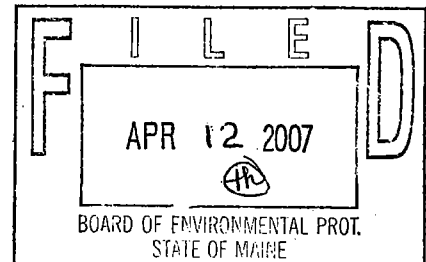


David P. Littell, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application February 15, 2007.

Date of application acceptance February 15, 2007.



Date filed with Board of Environmental Protection: _____

This order prepared by GREGG WOOD, BUREAU OF LAND AND WATER QUALITY

**MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM (MEPDES) PERMIT
&
MAINE WASTE DISCHARGE LICENSE (WDL)**

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STANDARD CONDITIONS	Attached

SPECIAL CONDITIONS

A. General limitations. The Cross Island facility (DMR site ASMI-CI) is limited to stocking Atlantic salmon in twenty four (24) polar circles (each measuring 100 meters in circumference) at any given time and is subject to the discharge limitations, monitoring requirements and management practices specified in the following sections. The facility may discharge from discrete floating net pens the following: fish excrement, fish feed, and drugs pursuant to Special Condition L, *Use of Drugs for Disease Control*, of this permit. Additionally, other discharges incidental to the normal and proper operation of the facility such as the loss of fish scales and treatment compounds used on structures and vessels to limit marine growth, may occur provided they do not have significant adverse effects on water quality.

Domestic waste shall not be discharged and must be collected and transported to a land-based facility authorized to dispose domestic waste.

B. Feeding rates and monitoring. The discharge of fish feed shall be at the minimum amount necessary to sustain an optimal rate of fish growth with the minimum loss of uneaten feed. For each species and year-class, the facility shall report its Food Conversion Ratio (FCR) as kilogram (kg) of feed used per kg of live weight of fish harvested or lost over the time those fish are confined to net pens. In calculating the FCR, the facility may use processing facility and gut loss information provided that records supporting the FCR determination are made available to the Department for review. These records are to be compiled in accordance with Department standards. Fish maintained in separate net pens as broodstock need not be included in FCR calculations.

The facility shall maintain a real-time monitoring system designed to track the rate of feed consumption and detect uneaten feed passing through the net pens. Such systems include, but are not limited to, doppler radar detection or video cameras. There shall not be any significant accumulation of unconsumed feed on the sea floor beneath or adjacent to net pens.

C. Mixing zones. This permit designates two mixing zones: (1) a Water Column Mixing Zone, and (2) a Sediment Mixing Zone. Outside the allocated Mixing Zones, discharges from the facility shall not cause or contribute to conditions that are hazardous or toxic to aquatic life, or that would impair the uses designated by the classification of the receiving waters. The location of the mixing zones may be shifted to reflect the effect of currents unique to a specific site, provided that the offset mixing zones are no larger in area than those defined by the size of the net pen(s).

1. Water Column Mixing Zone. The Water Column Mixing Zone is defined as the area within and extending 30 meters beyond the perimeter of a net pen in all directions on the surface, and down to the sea floor/water column interface.

SPECIAL CONDITIONS

- 2. Sediment Mixing Zone.** The Sediment Mixing Zone is defined as the sea floor directly below a net pen and extending on the sea floor 30 meters beyond the perimeter of each net pen in all directions. See Special Condition G of this permit for limitations on changes that may occur within the Sediment Mixing Zone.

D. Narrative limitations. The facility shall at all times comply with the State's water quality laws, including, but not limited to, the following narrative limitations that apply to waters beyond the designated Water Column Mixing and Sediment Mixing Zones. Discharges from the facility;

1. Shall not cause a visible oil sheen, foam, or floating solids at any time that would impair the uses designated by the classification of the receiving waters;
2. Shall not contain materials in concentrations or combinations that are hazardous or toxic to aquatic life, or that would impair the existing or designated uses of the receiving waters;
3. Shall not cause toxicity, visible discoloration, turbidity or other effects to the receiving water that would impair the existing or designated uses of the receiving waters;
4. Shall not discharge suspended or settleable solids that will have significant adverse effects on the quality or any uses of the receiving water body;
5. Shall not produce or result in harmful algae blooms that may be characterized by excessive growths of, but not limited to, the genera *Alexandrium*, *Dinophysis*, *Prorocentrum*, *Pseudonitzschia*, *Phaeocystis*, *Enteromorpha*, *Ulva* or *Aureococcus*; and
6. Comply with specific conditions of this permit and shall not cause or contribute to violations of water quality standards.

E. Monitoring Requirements

- 1. General requirements.** The permittee shall conduct periodic monitoring for ambient water quality, benthic analysis, biological assessment and video/photo surveys. Based on the results of monitoring or site-specific conditions, the Department may require the facility to conduct additional monitoring to determine compliance with this permit and applicable statutory requirements.

Summary of limitations and monitoring requirements. The following table is a summary of the monitoring required by the various Special Conditions below.

<u>Special Condition</u>	<u>Topic</u>
E.4	Fish feeding and monitoring
E.5	Near-field water quality monitoring requirements
E.6	Far-field and reference site monitoring requirements
E.7	Video and photographic monitoring requirements
E.8	Sediment and benthic monitoring requirements

SPECIAL CONDITIONS

- 2. Sampling information.** All monitoring information and records required by this permit shall be kept current at all times and made available to representatives of the Department and the Department of Marine Resources upon request. For all water column and benthic monitoring samples collected, the permittee shall measure and maintain records of the following information:

 - a. The sampling location, recorded as latitude and longitude to the nearest one-tenth second.
 - b. The date and time of day.
 - c. The current direction in relation to true north.
 - d. The tidal stage to the nearest one-half meter above/below mean low water.
 - e. The depth of water.

- 3. Modification of monitoring requirements.** The Department may, after notice to the permittee and interested parties of record, modify this permit to ensure that sufficient information is available to determine compliance with applicable water quality standards and the terms and conditions of this permit. Modifications may also be made to ensure monitoring required by this permit is, to the maximum extent possible, consistent with the Finfish Aquaculture Monitoring Program (FAMP) administered by the Maine Department of Marine Resources or other protocols established by the Department of Environmental Protection.

- 4. Feed discharge and fish monitoring requirements.** For each species of fish, the permittee shall maintain and report monthly to the Department the following information.

 - a. The number of net pens in use, including type, size and configuration;
 - b. The age, weight and number of fish in each net pen;
 - c. The number and total weight of fish contained in all net pens in use;
 - d. The total amount of feed added to each net pen; and
 - e. The total amount of feed added to all net pens.

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

5. Near-field water quality monitoring requirements. During the period of **June 1 through October 31** each year, the facility shall maintain the specified conditions and conduct the following monitoring of the ambient water **within the water column mixing zone** of the net pen. All samples shall be grab samples at locations selected to represent the greatest level of any impact of the facility's operation.

Table E.5. Monitoring Requirements at locations within 5 meters down-current of the pens (prevailing conditions at the time of sampling).

Sea Water Characteristic	Location			Monitoring Frequency
	Mid-Net Pen Depth	Mid-Water Column Depth	One Meter Above Sea Floor	
Dissolved Oxygen Concentration	≥6 mg/L	≥6 mg/L	≥6 mg/L	1/Week
Dissolved Oxygen Saturation.	Report %	Report %	Report %	1/Week
Salinity	Report ‰	Report ‰	Report ‰	1/Week
Temperature	Report °C	Report °C	Report °C	1/Week
Transparency	Report meters			1/Week

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

- a. Sampling Locations. Samples collected in compliance with the above monitoring requirements shall be taken within 5 meters of the net pens and down-current (prevailing conditions at the time of sampling), from where water passes through pens stocked with fish and at a point selected to best represent the maximum impact of the facility's operation. The samples shall be taken at mid-pen depth (i.e. if the containment net is 6 meters deep, take the sample at 3 meters from the surface), mid-water column depth, and within 1 meter of the sea floor, where each station's results are reported separately.
- b. Sampling methods. Water samples shall be analyzed for dissolved oxygen (DO) concentration and saturation, temperature and salinity at the frequencies specified in Table E.5 of this permit. Measurements of temperature and salinity (in parts per thousand) shall be used to determine percent saturation of dissolved oxygen and stratification. Samples should be taken within one hour before or after slack water prior to 9:00 AM. If the frequency of sampling is increased such that early morning slack tide measurements cannot be made, samples shall be collected prior to 9:00 AM, irrespective of tidal conditions. All measurements shall be made using approved methods, and in accordance with the applicable manufacturer's instructions; including calibration of instruments. The depths of all measurements shall be recorded to at least the nearest one-half meter.
- c. Transparency readings shall be made by lowering a 30 cm Secchi disk vertically through the water column. Observations are to be made using a viewing scope to penetrate the surface of the water. The depth of disappearance upon descent and reappearance upon retrieval of the disk shall be measured and averaged.
- d. Compliance with DO concentration. If DO concentrations below 6 mg/L are recorded at any depth, additional samples shall be taken to determine if the DO depression is a result of the facility's discharge. To determine if DO depression below 6 mg/L reflects natural conditions, readings must be taken at the far-field and reference sites (see Special Condition E.6 and Special Condition F) at the comparable times, depths and tidal conditions and reported to the Department with the monthly Discharge Monitoring Reports. **Further, any time the DO saturation is less than 85% as measured within 5 meters of the net pens, far-field monitoring described in Special Condition E.6 shall be conducted.**
- e. Reduced monitoring. After at least two years of monitoring, including one year when market size fish are on site, the Department may reduce monitoring to 1/month provided that all results demonstrate compliance with percent saturation standards for the respective class of water. In considering reduced monitoring, the Department will evaluate factors that may influence the representativeness of monitoring reports, such as the total number of fish on site, stocking density, water temperature or unusual environmental conditions.

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

- 6. **Far-field and reference site water quality monitoring requirements.** During the period of **June 1 through October 31** each year, or as required by Special Condition 5(d) of this permit, the facility shall maintain the specified conditions and conduct the following monitoring of the ambient water adjoining the net pens. **All samples shall be vertical profiles measured at intervals of 1 meter or less** at a location selected to represent the greatest level of any impact of the facility's operation.

Table E.6. Far-field and reference site water quality monitoring requirements.

Sea Water Characteristic	Monitoring Frequency		
	Minimum value	Average value	Maximum value
Dissolved Oxygen Concentration	Report mg/l	Report mg/l	Report mg/l 2/Year in August and September and as required by Special Condition E.5.d
Dissolved Oxygen Saturation	85%	Report %	2/Year in August and September
Temperature	Report °C	Report °C	2/Year in August and September
Salinity	Report ‰	Report ‰	2/Year in August and September
Transparency	Report meters		2/Year in August and September

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

6. Far-field and reference site water quality monitoring requirements

- a. Sampling locations. Samples collected in compliance with the above monitoring requirements shall be taken at a position approximately 30 meters down-current (prevailing conditions at the time of sampling) from where water passes through pens stocked with fish and at a point selected to best represent the maximum impact of the facility's operation. As required by the Department, samples shall also be collected at the reference site (see Special Condition F). **All information recorded in profiles shall be reported to the Department.**
- b. Sampling methods. Water samples shall be analyzed for dissolved oxygen (DO) concentration and saturation, temperature and salinity at the frequencies specified in Table E.6 Measurements of temperature and salinity (in part per thousand) shall be used to determine percent saturation of dissolved oxygen. Samples should be taken one hour before or after slack water prior to 9:00 AM. If the frequency sampling is increased such that early morning slack tide measurements cannot be made, samples shall be collected prior to 9:00 AM, irrespective of tidal conditions. All measurements shall be made using approved methods, and in accordance with the applicable manufacture's instructions, including calibration of instruments. The depths of all measurements shall be recorded to at least the nearest one-half meter.
- c. If DO saturation levels below 85% are recorded at any depth, additional samples may be taken to determine if the DO depression is a result of the facility's discharge. In order to determine if DO depression below the specified saturation reflects natural conditions, readings must be taken at the reference site (see Special Condition F) at the comparable times, depths and tidal conditions and reported to the Department with the applicable Discharge Monitoring Reports.
- d. Transparency readings shall be made by lowering a 30 cm Secchi disk vertically through the water column. Observations are to be made using a viewing scope to penetrate the surface of the water. The depth of disappearance upon descent and reappearance upon retrieval of the disk shall be measured and averaged.

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

7. Video and monitoring requirements. The facility shall conduct color video evaluations of the sea floor under and adjacent to the net pen system as follows. Multiple evaluations may be needed where independent pens or systems preclude coverage by one transect. Monitoring and evaluation shall be conducted in accordance with methods in the Department of Marine Resource's Finfish Aquaculture Monitoring Program (FAMP), or other protocols established by the Department of Environmental Protection, unless otherwise specified herein.

Smolts/juvenile (less than one year after stocking)

Table E.7. a - April or May and August, September and October of each year

Monitoring Characteristic	Substrate Video Monitoring Transects			Monitoring Frequency
	Transect Beneath Pens	Transect 60 m Up-current From Edge of Pens	Transect 60 m Down-current From Edge of Pens	
Video Tapes of Substrate	Report	Report	Report	2/Year

Adult/Market sized fish (greater than one year after stocking)

Table E.7. b - April, May, June, July, August, September and October of each year

Monitoring Characteristic	Substrate Video Monitoring Transects			Monitoring Frequency
	Transect Beneath Pens	Transect 60 m Up-current From Edge of Pens	Transect 60 m Down-current From Edge of Pens	
Video Tapes of Substrate	Report	Report	Report	1/Month

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

7. Video tape monitoring requirements

- a. Reports of monitoring shall include the date(s) on which monitoring was conducted and the video tapes, along with all supporting information including a site schematic of the video track location in relation to the net pens. The beginning and ending points of transects shall be located by GPS.

Video tapes and written reports for the FAMP shall be submitted to the Department of Marine Resources within 90 days of the monitoring event.

Video tapes for evaluations conducted at times other than for the FAMP shall be kept on file at the permittee's home office and made available to regulatory agencies for periodic review within 15 days of the monitoring event.

Written reports for evaluations conducted at times other than for the FAMP shall be submitted to the Department of Marine Resources within 90 days of each monitoring event.

- b. Except as provided below, the survey shall be documented with continuous video footage. The filmed survey shall document the sediment type and color, as well as features, noting erosional or depositional areas. The survey shall also document the flora/fauna observed as to their relative abundance, as well as any feed pellets or other man-made debris. The presence of *Beggiatoa* type mats shall be noted, and its growth described as light, moderate, or heavy. Black sediments, spontaneous or induced gassing, or the presence of pimples shall be noted. "Pimpled" sediments may also represent the presence of infauna, and as such, will not be used exclusively as an Impact Limit unless such marks are readily distinguishable from infauna burrows. The location of any nets located on the bottom shall be documented relative to the pen system, and the extent to which the net is buried beneath sediments shall be noted. Relative abundance of *Beggiatoa* should be characterized approximately as follows: abundant, frequently present within the film coverage; common, seen occasionally throughout the film coverage or existing in patches; rare, only seen once or in a few places throughout the dive.

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

7. Video and photographic monitoring requirements

- c. A video/photo transect shall be conducted beneath the pens (directly adjacent to the up-current edge of the pens) along an axis representing the direction of the prevailing current, and extend 60 meters beyond the pen system on each end, and located to best reflect the extent of the facility's impact on benthic conditions. Video coverage of sediments beneath or adjacent to feed or service barges shall be noted on the film narrative.
- d. The film coverage shall be in color, and of sufficient detail and clarity to allow for the accurate assessment of benthic conditions. The camera should be positioned at a height above the substrate that will provide approximately one square meter of bottom coverage, and be illuminated with sufficient artificial light to enable the accurate identification of epibenthic organisms and sediment conditions. A brief written narrative with the tape or photos describing reference points shall be provided. All film documentation shall include the dates on which it was taken, the direction of the current, and the geographic positions of the start and endpoints of the transects.

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

8. The facility shall conduct monitoring of the sediments on the sea floor as follows. Benthic monitoring shall focus on sediment conditions and the infaunal community. The reference site is described in Special Condition F. The Department may require that the monitoring required by this condition be continued following removal or relocation of a net pen as necessary to evaluate residual impacts. Monitoring and evaluation shall be conducted in accordance with the Department of Marine Resource's Finfish Aquaculture Monitoring Program (FAMP), or other protocols established by the Department of Environmental Protection, unless otherwise specified herein.

Table E.8. Sediment and benthic monitoring requirements.

Monitoring Characteristic	Sample Location			Monitoring Frequency
	Within the mixing zone	30 m from net pens	Reference Site	
Redox Potential	Report mV	Report mV	Report mV	2/Year in April-May and August-October
Sulfide	Report uM	Report uM	Report uM	2/Year in April-May and August-October
Anoxic Sediments, Gas Formation, and <i>Beggiatoa</i>	Report	Report	Report	2/Year in April-May and August-October
Azoic Conditions	Report /0.1 square m	Report /0.1 square m	Report /0.1 square m	1/5 years and as required, see Special Cond.E.8.a
Taxa Present, Absolute, Relative Abundance, and Shannon-Wiener Diversity Index	Report /0.1 square m	Report /0.1 square m	Report /0.1 square m	1/5 years and as required, see Special Con.8.a
Sediment grain size	Report % sand, silt, clay or gravel	Report % sand, silt, clay or gravel	Report % sand, silt, clay or gravel	When taxa measurements are made
Total Organic Carbon in Sediment	Report, mg/g	Report, mg/g	Report, mg/g	When taxa measurements are made
Copper, Total metal	Report mg/kg Dry weight	Report mg/kg Dry weight	Report mg/kg Dry weight	Once per 2 years
Zinc, Total metal	Report mg/kg Dry weight	Report mg/kg Dry weight	Report mg/kg Dry weight	Once per 2 years
Medications used	Report ug/kg Dry weight	Report ug/kg Dry weight	Report ug/kg Dry weight	Within one month of use

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

8. Sediment and benthic monitoring requirements

- a. Sampling locations and times. Samples for all parameters shall be taken at the same locations. Sampling locations shall be along a transect as described for video monitoring in Special Condition E.7. of this permit. There shall be a minimum of 4 locations along the transect, 2 on each side of the net pens. On each side of the net pen system, one location shall be taken at 30 meters from the pens and will represent conditions outside of the mixing zone. Another sample shall be taken within the mixing zone where benthic impact is observed to be the greatest; if no differences in impact can be observed, the location shall be approximately 5 meters from the pens. At each location, a minimum of 3 individual samples shall be collected along a line perpendicular to the transect line, and spaced at distances reflecting and within the lateral extent of the greatest benthic impacts at that location. In order to fully evaluate conditions, the Department may require additional sampling locations on a case-by case-basis.

Benthic sampling shall be done at the same time as the video observations are made. See Special Condition E.8.f for testing of medications. At a minimum, azoic conditions and taxa measurements shall be conducted in August – October once during a 5-year period in a year when fish in the facility are near their maximum biomass. Additionally, these measurements shall be made at any time a warning level in Special Condition G is exceeded, unless the Department determines that the cause of the exceedence has been corrected pursuant to Special Condition G. Copper and zinc are to be tested once per two years in a year when fish in the facility are near their maximum biomass, and reports shall include the percent solids of the sediment sampled. Other measurements shall be conducted twice per year, in April – May and August – October. However, the Department may modify the April – May benthic sampling if the video monitoring is modified pursuant to Special Condition E.7. See Special Condition F for when reference sites must be sampled.

- b. Reports shall include the date(s) of the sampling and the results of the analyses, along with all supporting information including a site schematic of the sample locations. **Reports shall be submitted to the Department within 150 days of the monitoring event.** However, based on prior benthic monitoring, video monitoring, or other information that indicate the facility may be adversely impacting the sediment, the Department may require earlier submission of benthic monitoring reports.

SPECIAL CONDITIONS

E. Monitoring Requirements (cont'd)

8. Sediment and benthic monitoring requirements

- c. Each grab sample shall be inspected for evidence of anoxia, the presence of *Beggiatoa* type bacterial mats, and gas formation (hydrogen sulfide or methane). The surface color of the sediment sample (specifically, sediments are black or significantly darker than natural sediment in the area), and any evidence of gas formation (e.g. pimpled sediments, hydrogen sulfide odor) or *Beggiatoa* shall be reported. If sub-samples are taken from a grab or box type corer for the sediment analysis and the remaining sample is used for infauna analysis, no more than one-quarter of the surface of each sample can have been removed for the sediment analysis.
- d. Cores for metals or medications must be of the top 2 cm, and in the top 3 cm for Redox potential and sulfide. Single cores 4 inches or greater in diameter shall be taken from the sediment for infauna and must be inserted to resistance or 15 cm, whichever is less. Depth of the core shall be reported. The permittee shall conduct a grain size analysis and determine percent (%) solids for each core. Infauna samples shall be sieved through a 1.0 mm mesh sieve. Organisms shall be fixed in 10% buffered formalin and stained with a 1% Rose Bengal staining solution. After 5 days in the formalin solution, the formalin shall be replaced with 70% ethanol to ensure preservation of the organism's integrity. Organisms shall be identified to the family or a lower practical taxonomic level and enumerated. The Department may require more specific identification of organisms in order to determine compliance with this permit. A conversion coefficient shall be developed to convert the core sample surface area to 0.1m² for reporting family abundance and richness.
- e. Sediment sample collection, handling, preservation, storage, and analysis shall be conducted in accordance with EPA approved methods. See references listed in Attachment A of this permit (EPA 1995, and 1986-1991) for appropriate guidance.
- f. Tests for medications shall be conducted for each medication used within one month of such use and shall include analysis for the compound(s) used and any known primary metabolites. The Department may waive this testing if the facility provides information demonstrating that medications used do not accumulate in the sediments or organisms.

SPECIAL CONDITIONS

- F. Reference sites.** The permittee shall maintain a reference site and the baseline information to provide comparative information on water quality and benthic conditions in the area of the net pens. Relevant baseline data will be used with reference station data for comparative information in evaluating the results of benthic monitoring tests. If baseline benthic data are no longer representative, and for water column information, additional reference site sampling shall be conducted in order to establish comparative information. The Department may require repeat or continual reference site monitoring as necessary to properly evaluate the results of monitoring data. The Department may require additional reference sites to be used where necessary to adequately characterize conditions in an individual location. New reference site(s) will be selected to best represent local conditions free of influences from the activities of the facility or other uses of the receiving water in the vicinity of the facility.

SPECIAL CONDITIONS

G. Impact thresholds. With respect to the sediment and benthic monitoring specified in Special Condition E.7 and E.8, the following criteria will be applied by the Department in determining if discharges from the facility are causing or contributing to impairment of the State's water quality criteria.

Table G.1. Sediment Mixing Zone impact thresholds **under or within 30 m** of the net pen.

<u>Metric</u>	<u>Warning Level</u>	<u>Impact Limit</u>
Redox Potential ¹	Mean value -100 to 0 mV nhe ⁷	Mean value <-100 mV nhe ⁷
Sulfide ¹	Mean 1300 – 6000 uM	Mean >6000 uM
<i>Beggiatoa</i> Coverage	≥25% photo coverage ^{4,7}	≥ 50% photo coverage ^{4,7}
Anoxic Sediments ³	≥25% photo coverage ^{4,7}	≥ 50% photo coverage ^{4,7}
Pollution-Tolerant Taxa ⁵	Number of individuals in single taxa > 70%	Report information
	AND	
Pollution-Sensitive Taxa ⁶	>50% reduction in mean abundance of taxa not identified as pollution-tolerant	Report information
Taxa richness	>25% reduction in total number of all taxa compared to mean baseline or reference site	Report information
Azoic conditions	>50% reduction in total abundance compared to mean baseline or reference site	Absence of infauna ⁷

SPECIAL CONDITIONS

G. Impact thresholds (cont'd)

Table G.2. Sediment Impact Thresholds Beyond Sediment Mixing Zone (≥ 30 m from the nets pens).

<u>Metric</u>	<u>Impact Limit</u>
Redox Potential ¹	Report information
Sulfide	Report information
<i>Beggiatoa</i> Coverage	Compelling evidence ^{2,7}
Anoxic Sediments	Compelling evidence ^{2,7}
Pollution-Sensitive Taxa ⁶	Significant decrease in mean number of listed taxa as compared to mean baseline or reference site value ⁸
Taxa Richness	Significant decrease in mean number of total taxa as compared to mean baseline or reference site value ⁸

Footnotes to Tables G.1 and G.2:

¹ Redox Potentials (Eh) shall be measured in millivolts (mV) relative to the normal hydrogen electrode (nhe) for the top 3 cm of the sediment profile. See Wildish et al. 1999 for an acceptable approach to redox sampling, analysis and instrument calibration. Mean values for redox and sulfide shall be the average of all individual samples collected at a location a given distance from the net pens.

² Compelling evidence includes photo or video documentation, diver observations, or sediment analyses that reveals actual off-gassing, or evidence of gas formation, including “pimpled” sediments and the smell of hydrogen sulfide gas emitted from grab samples or the presence of *Beggiatoa*, and such conditions are not observed in the baseline or reference site, or are the result of natural conditions.

³ Anoxic sediments consist of black or significantly darkened sediment in comparison to natural conditions in the area, and/or the formation of hydrogen sulfide or methane gas as characterized by emission of gas bubbles, “pimpled” sediments or odors in the sediment.

SPECIAL CONDITIONS

G. Impact thresholds (cont'd)

Footnotes to Tables G.1 and G.2:

⁴ Percent cover shall be determined by the Department from the review of video footage taken beneath or adjacent to each pen.

⁵ Pollution-tolerant taxa include the following the Polychaetes: *Capitella capitata*, Oligochaetes and other taxa that may be present as determined from baseline information and/or the reference site.

⁶ A list of pollution-sensitive taxa is to be determined from pre-operation baseline studies and/or the reference site specified in this permit. Such species include, but are not limited to, amphipods and cumaceans.

⁷ Unless similar abundance or values exist in the baseline or reference site specified in this permit, or are the result of natural conditions.

⁸ The significance will be based on statistical analysis at a confidence interval acceptable to the Department, and meeting generally accepted professional standards.

The forgoing impact limits represent one definition of conditions that would represent non-attainment of narrative water quality standards. To assess compliance, the Department may consider the results of monitoring conducted pursuant to this permit, the conditions found in the baseline or reference site for comparative purposes and other available information. This information may include, but is not limited to, total abundance, relative abundance, diversity indices, dominant taxa, the percentage of mollusks, echinoderms and crustaceans, and trophic levels. In doing so, the Department may determine that other conditions found at an individual location may constitute a violation of narrative water quality standards.

Physical disturbance such as harrowing, dragging, or other mechanical means shall not be used to mitigate bottom conditions.

The permittee shall notify the Department as soon as it has reason to believe the warning levels that are specified for the Sediment Mixing Zone may be exceeded. At that time, or upon notification by the Department, the permittee shall review its past operations and propose any changes that it deems to be necessary to ensure that impact levels are not exceeded. If the degree by which warning levels are exceeded in subsequent monitoring events is increased, or if an impact level is exceeded at any time, the permittee shall include in its notification, for the Department's for review and approval, a plan and implementation schedule for modification of operations. Such modifications may include, but are not limited to, reducing standing stock, reduced feeding, fallowing of the site and/or collection of settled

SPECIAL CONDITIONS

G. Impact thresholds (cont'd)

materials before they reach the sea floor. New fish shall not be stocked into pens at the facility until the approved plan has been implemented. The Department may require additional monitoring to determine the effectiveness of these measures or continuing trends in benthic conditions.

H. Toxic impacts

1. The discharge of toxics into the waters of the State in concentrations identified by the Department as toxic to aquatic organisms is prohibited. When waters are temporarily contained within a barrier, such as a plastic tarpaulin, for the application of medications, at the point the barrier is removed the concentration of those medications shall not pose a risk of causing lethal effects on organisms passing through the water column. Within the water column mixing zone, acutely toxic (lethal response) conditions must not occur. At the edge of the water column mixing zone concentrations of any compound cannot exceed levels known to cause acute or chronic toxicity to marine organisms, or sub-lethal effects from repeated exposure.
2. Sediments within or beyond the Sediment Mixing Zone shall not contain toxics originating from the facility in concentrations or combinations that are likely to have a significant adverse effect on benthic infauna or epifauna, or bio-accumulate in organisms such that those organisms can have a significant adverse effect on marine life that prey upon them. Such marine life includes, but is not limited to, demersal finfish, lobster, and marine mammals.

I. Protection of Atlantic Salmon. This section applies to the stocking of Atlantic salmon only. The Department may, after notice to the permittee and interested parties of record, modify this permit to consider new information regarding the protection of Atlantic salmon or relevant conditions that may be imposed by the US Army Corps of Engineers.

1. a. **The stocking of Atlantic salmon originating from non-North American stock is prohibited. Within 30 days of placement of fish,** the permittee shall provide the Department with written confirmation regarding compliance with this condition. Non-North American stock is defined as any Atlantic salmon that possess genetic material derived partially (hybrids) or entirely (purebreds) from any Atlantic salmon stocks of non-North American heritage, regardless of the number of generations that have passed since the initial introduction of the non-North American genetic material. For the purposes of this permit, classification of brood fish as either North American or

SPECIAL CONDITIONS

I. Protection of Atlantic Salmon(cont'd)

non-North American stock will be based on genetic evaluation of each fish's DNA in accordance with Attachment B of this permit entitled, *Atlantic Salmon Microsatellite Analysis Protocol*. The Microsatellite Protocol shall be used to classify each brood fish and only the progeny of brood fish classified as North American stock will be allowed in net pens.

If sub-samples of a population are to be used to demonstrate compliance with Attachment B, the sub-samples shall be demonstrated to be a statistically valid representation of the population and the sampling scheme shall be approved by the National Marine Fisheries Service and/or the U.S. Fish and Wildlife Service.

- b. Only individual fish determined to be North American, according to Attachment B, can be used to produce offspring to be placed in net pens. No fish classified as non-North American according to Attachment B can be utilized to create progeny for stocking in net pens.
 - c. **Prior to January 1 of each year**, genetic evaluation information developed pursuant to Attachment B shall be submitted to the National Marine Fisheries Service and/or the US Fish and Wildlife Service, with confirmation sent to the Department.
 - d. **Prior to March 1 of each year**, the permittee shall submit to the Department a letter from the National Marine Fisheries Service and/or the US Fish and Wildlife Service certifying the results of the genetic evaluation information submitted pursuant to Special Condition I.1.c, above. In the event any fish or gametes are found to be non-North American pursuant to Attachment B, the permittee shall also report to the Department the disposition of those fish or gametes.
2. Transgenic salmonids are prohibited. Transgenic salmonids are defined as species of the genera *Salmo*, *Oncorhynchus* and *Salvelinus* of the family Salmonidae and bearing, within their DNA, copies of novel genetic constructs introduced through recombinant DNA technology using genetic material derived from a species different from the recipient, and including descendants of individuals so transfected.
 3. Personnel from the Department, the Department of Marine Resources, the US Environmental Protection Agency, the National Marine Fisheries Services, the US Fish and Wildlife Service and the Maine Atlantic Salmon Commission shall be allowed to inspect the facility during normal operation hours. These personnel will provide credentials attesting to their position and will follow the site's biosecurity procedures and may, at market value, purchase random samples of salmon from the facility to monitor compliance with Special Conditions I.1 and I. 2. Operational records regarding compliance with this permit shall be made available to these personnel for their inspection upon request.

SPECIAL CONDITIONS

I. Protection of Atlantic Salmon (cont'd)

4. In accordance with the following dates, fish introduced into net pens must be marked to designate their origin so that in the event they escape or are released from the facility, they may be identified. The Department will solicit comments from the Department of Marine Resources, the Maine Atlantic Salmon Commission, the US Environmental Protection Agency, the National Marine Fisheries Service and the US Fish and Wildlife Service prior to granting any approvals pursuant to this section.
 - a. **On or before July 31, 2007**, all fish placed in net pens must be identifiable through external means as commercially reared and identifiable as to the individual facility into which they were placed. Alternately, the Department may take the following steps regarding implementation of facility specific marking.
 - i. Reopen this permit in order to consider other or new information concerning marking; or
 - ii. Consider facility specific marking upon renewal of this permit.
5. The intentional release of Atlantic salmon to the receiving waters beyond the confines of the net pens is prohibited.

SPECIAL CONDITIONS

I. Protection of Atlantic Salmon (cont'd)

6. The facility shall employ a fully functional marine Containment Management System (CMS) 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 that particular system. The facility 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.
 - a. **The CMS will be audited at least once per year and within 30 days of a reportable escape** (more than 50 fish with an average weight of 2 kg or larger) 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 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 as in the corrective action plan approved by the Department. 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 permittee shall notify the Department upon completion of corrective actions.
 - b. On-site facility personnel responsible for routine operation shall be properly trained and qualified to implement the CMS. See Special Condition N.
 - c. The permittee shall maintain complete records, logs, reports of internal and third party audits and documents related to the CMS. The submission of standing inventory at the facility, including all transfers in and out, losses associated with disease, predation or escapes reported to the Department of Marine Resources at the pen level of detail on a monthly basis according to the requirements of 12 MRSA Section 6077 shall meet the requirements of the CMS.

The permittee shall report any known or suspected escapes of more than 50 fish with an average weight of 2 kg each or more within 24 hours to the Department of Maine Resources at 207-624-6554 (or 800-432-7381 during off-hours).

SPECIAL CONDITIONS

J. Best Management Practices for operation of the facility

1. Unless prohibited by prolonged periods of adverse weather, **the permittee shall remove fish carcasses from the net pens at least once per week.** However, when diseases of regulatory concern are present or suspected in the area of the facility, carcasses shall be removed more frequently in accordance with the requirements of the Department of Marine Resources or the US Department of Agriculture. Carcasses shall not be disposed of into the receiving waters, but instead shall be collected transported in leak-proof containers to an approved land-based disposal facility. Records of carcasses removed shall be maintained by the facility and made available to the Department and the Department of Marine Resources upon request.
2. The discharge of blood, viscera, or transport water containing blood associated with fish harvesting is prohibited.
3. There shall be no discharge of disinfectants, cleaning agents or similar products, except for losses that may occur incidental to the proper use of these agents. The facility shall maintain and follow best management practices for the use and control of these substances.
4. The discharge of solid waste is prohibited. The facility shall collect used feed bags and other solid wastes for transport, recycling and/or disposal at a recycling or disposal facility approved by the Department.
5. The use of biocidal chemicals for cleaning nets on-site is prohibited. The use of air-drying, mechanical and other non-chemical procedures to control net-fouling organisms is encouraged. On-site mechanical cleaning of nets is permitted only if done in accordance with a management plan to ensure that solids from these practices do not accumulate on the sea floor or cause or contribute to impairment of water quality standards, or non-compliance with the thresholds established in Special Condition G. In order to control diseases of regulatory concern, net cleaning procedures required by the Department of Marine Resources or the US Department of Agriculture shall be followed. The on-shore disposal of materials removed from nets must be in compliance with applicable state and local laws. In the event that sediment monitoring indicates a potential for impact from copper or other anti-fouling agents or other established impact limits, the Department may require the use of alternate practices to avoid such effects.
6. The use of materials containing or treated with tributyl tin (TBT) compounds is prohibited.

SPECIAL CONDITIONS

J. Best Management Practices for operation of the facility (cont'd)

7. When in use, **horizontal predator nets shall be maintained at least three (3) meters above the sea floor at all times.** Nets may not impede the current flow or tidal exchange so as to contribute to the deposition of solids that would impair water quality standards. Vertical predator nets may extend to the sea floor. The storage of predator control or containment nets on the sea floor is prohibited. Any net accidentally dropped or lost during storm events that is not recovered immediately shall be tagged with a float, positioned using differential GPS, numbered, and reported to the Department within 24 hours. The net shall be recovered within 30 days from the date lost, unless the Department allows a longer time in an individual case, and the Department shall be notified on the date the net is recovered.
8. **The permittee shall notify the Department of the termination, addition to or significant reorientation of the existing mooring systems with 15 days of said activity.** Such changes may warrant modifications to the benthic and other monitoring plan requirements.
9. **The permittee shall report to the Department within 24 hours, any unusual events at the facility that might cause a significant environmental impact.** Reportable "unusual events" would include, but not be limited to, fish kills (i.e. wild fish, and cultured fish beyond a weekly mortality rate exceeding 150% of the average in the preceding month), algae blooms, significant damage to nets or other equipment, interactions with marine mammals, or vessel collisions with the net pen system. Upon request by the Department, the permittee shall collect and preserve a water sample, and store it until such time that the Department can retrieve it.

K. Husbandry Practices. The permittee shall stock only a single year class of fish and fallow the site for a sufficient time to avoid the harboring or spread of diseases from one year class to the next. However, unless otherwise directed by agencies concerned with fish health, the facility may maintain fish used for broodstock purposes during the period. The carryover shall not exceed 10% of the total number of fish in the year class during the last production cycle. The facility must be in compliance with the Department of Maine Resources' rules on the importation of live marine organisms, Chapter 24 that, among other things, govern disease surveillance and reporting.

SPECIAL CONDITIONS

L. Use of drugs for disease control

1. Drugs approved by the FDA for aquacultural purposes may be used consistent with label instructions. Drugs authorized, but not approved, by the FDA may be discharged consistent with Special Condition L.3, below. All applications must comply with applicable FDA requirements. The use of vaccines as a preferred means to control disease is encouraged. The discharge of any approved drug administered as preventative measures is prohibited unless the following conditions are met: the drug must be approved by FDA and the treatment and route of administration must be consistent with the drug's intended use. The term "discharge" includes any drug or other chemical treatment that is introduced to the fish through injection, ingestion, or immersion at the facility.
2. When the need to treat or control diseases necessitates the use of a FDA approved drug not identified in a permittee's application or inconsistent with FDA label instructions, the permittee shall notify the Department as soon as becoming aware of such circumstances. If advance notice is not possible, the permittee shall notify the Department on the next business day after the use has begun. The notification shall include a description of the drug, its intended purpose, amount, concentration, duration of the use 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.
3. The discharge of drugs authorized by the FDA for use during studies conducted under the Investigational New Animal Drug (INAD) program is prohibited unless in accordance with specific consent given in writing by the Department. Proposals for the use of investigational drugs must demonstrate that the minimum amount of drug necessary to evaluate its safety, efficacy, and possible environmental impacts will be used. Proposals 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.
4. **The discharge of any drug or other disease control chemicals shall be reported to the Department within 30 days of the application.** Included in this report shall be the following: a) date and time of treatment; b) drug or disease control chemical used; c) concentration of drug or disease control chemical administered and total quantity used, including amount of feed used if applied through feed; d) approximate number of fish as well as number of pens treated; e) method of application; and f) predominant current direction during treatment.

SPECIAL CONDITIONS

L. Use of drugs for disease control (cont'd)

5. The permittee shall place signs at the perimeter of its leasehold to notify the public that drugs are or have been in use at that facility. The signs shall be maintained for the duration of the use and any withdrawal period following termination of use. The signs shall be at least 18 by 24 inches in size and read: *"Medications are in use at this site. Contact the Maine Department of Environmental Protection or Atlantic Salmon of Maine, LLC for details"* and include the DMR site designation of ASM-CI.

M. Best Management Practices for spill control

Any event that leads to the discharge of oil (including but not limited to: motor fuels, heating fuels, lubricating and hydraulic oils, waste oils, and transformer mineral oils) or hazardous substances into the waters of the State, or adjoining shorelines in a quantity sufficient to cause a film or sheen upon the water, or cause a sludge or emulsion to be deposited beneath the surface of the water or upon the adjoining shoreline shall be reported to the Department via the State Police at 1-800-4552-4664 and the National Response Center at 1-800-424-8802.

The permittee shall maintain and implement a current Spill Prevention Control and Countermeasure (SPCC) Plan for the facility prepared by a Professional Engineer or other qualified professional. This plan shall be approved by the Department and include information and procedures related to the prevention of spills and unplanned discharges of petroleum products including diesel fuel, gasoline, lubrication oils, or any other hazardous materials used at the facility.

1. The plan shall provide a complete list, including quantities, of all petroleum products and other hazardous materials stored at and transferred between the facility, its support craft and its shore-based storage facilities. The plan shall be amended when petroleum products and other hazardous materials not currently listed are transferred to the facility, and a copy sent to the Department.
2. The plan shall include descriptions of the procedures, including routine equipment inspections, used to prevent, control and/or treat spills and unplanned discharges of petroleum products and other hazardous materials according to the type and magnitude of spill or discharge.
3. The plan shall include a description of the supplies and equipment maintained onsite that prevent, control or treat spills and unplanned discharges. Supplies should include spill kits sufficient to contain a spill equal to the amount of product or material at the facility.
4. The plan shall include a description of the reporting system that will be used to alert responsible facility management, potentially effected landowners and municipalities, and appropriate legal and regulatory authorities.

SPECIAL CONDITIONS

M. Best Management Practices for spill control (cont'd)

5. All members of the facility staff shall have an operation familiarity with the plan. Training shall include an annual mock spill exercise incident to review the response and reporting procedures of the plan. Documentation of staff training shall be made available to the Department upon request.
6. If the facility at any point becomes subject to the Oil Pollution Prevention regulations at 40 CFR Part 112 and stores oil in excess of the minimum threshold amounts listed in 40 CFR section 112.1(d)(2), then the SPCC Plan shall also include any additional conditions required by those regulations.

N. Quality assurance for environmental monitoring and containment systems.

Prior to any environmental data collection, infauna identification, analysis work, or containment system assessment associated with this permit, the facility shall provide to the Department documentation of the employee's or contractor's demonstrated capabilities to conduct such work. Additionally, sampling techniques and analysis methods that differ from those identified in this permit shall be provided to the Department for review and approval.

O. Monitoring and reporting.

Monitoring results required under Special Conditions E.6, E.7 and E.8 of this permit shall be summarized 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 shall be submitted to the following address:

Maine Department of Environmental Protection
Bureau of Land and Water Quality
Division of Water Quality Management
Aquaculture Monitoring
106 Hogan Road
Bangor, Maine 04401

SPECIAL CONDITIONS

P. Reopening the Permit For Modifications

Upon evaluation of the tests results or monitoring requirements specified in Special Conditions of this permitting action, new site specific 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 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 aspects as if such unlawful provision, or part thereof, had been omitted, unless otherwise ordered by the court

ATTACHMENT A

REFERENCES

APHA/AWWA/WPCF. 1992. Standard methods for examination of water and wastewater. 18th Ed. American Public Health Association, 1015 Fifteenth Street NW, Washington D.C. 20005. 1268 pp.

Borja, A., J. Franco, V. Perez. 2000. A marine biotic index to establish the ecological quality of soft-bottom benthos within European estuarine and coastal environments. Mar. Pol. Bul. 40: No. 12. 1100-1114.

USEPA. 1997. Methods for the Determination of Chemical Substances in Marine and Estuarine Environmental Matrices - 2nd Edition. (EPA/600/R-97/072). National Exposure Research Laboratory, Cincinnati, OH.

USEPA. 1995. QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations. (EPA 823-B-95-001). Office of Water, Washington, DC. Pp 50-100.

USEPA. 1986-1991. Recommended protocols for measuring selected environmental variables in Puget Sound. U.S. EPA Region 10, Puget Sound Estuary Program. Seattle, WA.

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Wildish, D.J., H.M. Akagi, N. Hamilton, and B.T. Hargrave. 1999. A recommended method for monitoring sediments to detect organic enrichment from mariculture in the Bay of Fundy. Can. Tech. Rep. Fish. Aquat. Sci. 2286: 31p.

ATTACHMENT B

Atlantic Salmon Microsatellite Analysis Protocol

This protocol will be used to determine which Atlantic salmon can be used for breeding and production stock pursuant to Special Condition I, *Protection of Atlantic Salmon*, of this permit. Inclusion of this protocol does not waive or diminish the objections the State has raised in State of *Maine v. Norton, et al., No. 00-250-B-C (D. Me., Dec. 7, 2000)*. The protocol describes a standardized procedure to classify fish as either North American or non-North American stock and is largely based on the procedures used by King et al. (2001; *Molecular Ecology*, 10: 807-821). The facility will be responsible for providing genotype data to the US Fish and Wildlife Service and the National Marine Fisheries Service (the "Services") for data analysis and fish classification as described herein.

DNA isolation

Genomic DNA will be isolated from tissue, fin clip or scale samples from each fish intended for use as broodstock employing either a commercially available DNA extraction, such as PureGene (Gentra Systems) or DNeasy tissue kit (Qiagen Inc.) or a phenol/chloroform based extraction system such as used in Patton et al. (1997; *Can. J. Fish. Aquat. Sci.*, 54: 1548-1556) or, particularly for scales, a Chelex-resin based protocol such as given in King et al. (2001). Quality and quantity of DNA will be visualized on 0.8 percent agarose gels, which will include a commercially available DNA standard for quantification and size determination.

Microsatellite analysis

The loci used to classify brood fish as either North American or non-North American stock will be: Ssa85, Ssa171, Ssa197, and Ssa202 (O'Reilly et al. 1996); SSOSL311 and SSOSL438 (Slettan et al. 1995, 1996) and Ssa289 (McConnel et al. 1995).

PCR conditions for the selected loci will essentially follow that of King et al. (2001) and Patton et al. (1997) with possible minor modifications for optimization of products of individual loci. The loci will be labeled with the dyes, Ned, Hex, and 6-Fam by ABI or any other comparable commercial supplier of labeled oligonucleotides. The size standard to be used will be 400 HD Rox (ABI). Microsatellite analysis will be performed using the ABI 3100 autosequencer or any other commercial system providing equivalent results. Fragment analysis will be accomplished using a combination of GENESCAN and GENOTYPER software packages from ABI, or any other commercial system providing equivalent results. The facility will present electronic data tables from the GENOTYPER program to the Services in spreadsheet format in Excel or any other commercially available program providing equivalent results that allow the data to be easily reformatted for subsequent analyses. The output files (gel tracings) from GENESCAN and GENOTYPER will also be provided by the facility at the same time to help the Services assure data quality. Data provided must be complete at all loci for all fish.

Size verification of allelic products

To ensure accurate sizing of allelic products from the aquaculture fish relative to the designations developed in the King laboratory (see King et al. 2001), Dr. King will provide samples for use as controls. The Services will provide an adequate supply of DNA samples from representative fish of known genotypes to enable calibration of equipment throughout the term of the controlling license conditions. Control samples will be used at the inception of the study to set the automated allele designation/binning parameters of the GENOTYPER software so that all subsequent calls made for aquaculture fish will be automatically sized relative to the standards originally provided by Dr. King.

Genetic screening

Identification of North American aquaculture stock will be based on assignment tests performed with GeneClass, www.montpellier.inra.fr/URLB/geneclass/geneclass.html. Aquaculture fish will be compared to two reference groups. The first group will be comprised of samples from North America (Dennys, Ducktrap, East Machias, Machias, Narraguagus, Penobscot mainstem, Pleasant, Sheepscoot, Conne, Gold, Gander, Miramichi, Saguenay, and Stewiacke rivers and aquaculture stocks derived from St John and Penobscot populations). The second group will be comprised of non-North American samples from at least 2 rivers each from Iceland, Norway, Finland, Scotland, Ireland, and Spain and the Landcatch aquaculture stock.

The likelihood for assigning any given fish to each reference population will be calculated using the program GeneClass. If the ratio of the likelihood scores indicates that North American origin is at least twice as likely as non-North American origin, then that fish will be considered to be of North American origin. All other fish will be classified as non-North American stock. The Services will promptly report the results to the facility.

**MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
AND
MAINE WASTE DISCHARGE LICENSE**

FACT SHEET

Date: **March 5, 2007**

PERMIT NUMBER: **ME0110507**
LICENSE NUMBER: **W009005-5Q-A-N**
DMR SITE DESIGNATION: **ASMI-CI**

NAME AND ADDRESS OF APPLICANT

**ATLANTIC SALMON OF MAINE, LLC
133 Smalls Point Road
Machiasport, Maine 04655**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Northwest Harbor, Cross Island
Machias Bay
Cutler, Maine**

COUNTY: **Washington County**

RECEIVING WATER/CLASSIFICATION: **Machias Bay, Class SB**

COGNIZANT OFFICIAL AND TELEPHONE NUMBER: **David Miller
Production Manager
(207) 255-6714**

1. APPLICATION SUMMARY

- a. Application – Atlantic Salmon of Maine, LLC (ASM) has filed an application with the Maine Department of Environmental Protection (Department) for a new combination Maine Pollutant Discharge Elimination System (MEPDES) permit #ME0110507/Maine Waste Discharge License (WDL) #W009005-5Q-A-N for the discharge(s) of wastes associated with the operation of an Atlantic salmon aquaculture facility located in Cutler, Maine. See Attachment A of this Fact Sheet for a location map. ASM proposes to operate a facility that is comprised of twenty four (24) polar circles, each measuring 100 meters in circumference, with a stocking density ranging from 20 kg/m³ to 30 kg/m³ and maximum biomass of 3,821,000 kg.

1. APPLICATION SUMMARY (cont'd)

- b. General Description of Finfish Aquaculture - Finfish aquaculture activities are conducted by placing fish in a system of one or more free-floating net pens moored in the open ocean. Most fish are introduced as juveniles and raised to adult size for harvest as a commercial food source. Some fish may be maintained as brood stock. The fish are grown or maintained by adding fish food and, as necessary, medications to the water. Currently, Atlantic salmon (*Salmo salar*) is the only species to be reared on the Cross Island site. Fish are maintained on a year-round basis. The typical rearing period for Atlantic salmon is 18 to 20 months, during which they reach a harvestable size of 8 lbs to 12 lbs.

The majority of discharges from the facility are expected to come from fish excrement and unconsumed feed. The discharges increase significantly during the months of August, September and October when the fish are growing more rapidly in response to increased feeding and optimum growing conditions. Medications may be used to prevent or combat infectious disease or parasites. The US Food and Drug Administration (FDA) grants approval for specific uses of medications, although a veterinarian may prescribe an approved drug for a use or rate not described on its approved label. Additionally, FDA may authorize the use of Investigational New Animal Drugs ("INAD") and aquaculture facilities may wish to use such medications as part of studies of their effectiveness. Other discharges incidental to the operation of an aquaculture facility include fish scales, disinfectants used to prevent the spread of disease, marine growth removed from nets and anti-fouling agents used to treat nets.

The State's Department of Marine Resources (DMR) issues finfish aquaculture leases. The individual leases range in size from less than 2 acres to 45 acres. The Cross Island lease has an area of 25 acres. In most instances, however, only a small portion (about 10%) of the leased area is actually utilized for the placement of net pens. In terms of net pens, the active facilities have from 6 to 54 individual pens and these cover approximately 0.2 to 4 acres. The maximum number of fish contained per facility ranges from approximately 61,000 to over 1,000,000 fish. ASM proposes a stocking density ranging 20 kg/m³ to 30 kg/m³ for the Cross Island site which correlates to a maximum of approximately 650,000 market size fish on the site at any given time.

The location of finfish aquaculture facilities is important to both their success in rearing fish and in minimizing environmental impacts. Typically, facility owners seek locations that provide adequate tidal flushing, appropriate water depths, temperatures and dissolved oxygen concentrations in order to optimize fish growth. Facilities must also be located in areas that avoid conflicts with other marine uses such as public access, fishing and navigation. Additionally, facility operators also consider other siting considerations and are concerned with sites that have very low winter water temperatures, damaging ice floes or that are subject to high wind or rough seas since all these conditions can contribute to increased mortality of stocked fish.

1. APPLICATION SUMMARY (cont'd)

c. Cross Island Operations:

- 1. Historical: The DMR issued the most current aquaculture lease for the Cross Island site on September 2, 1997 in the name of Atlantic Salmon of Maine, LLC. The lease is due to expire on September 1, 2007. The site was last stocked with salmon smolts in the spring of calendar year 2001 with harvesting of adult fish in the fall of 2003. The site has been fallowed since late fall 2003 with restocking scheduled for April of 2007.

See the discussion in Section 5, *Site Conditions*, of this Fact Sheet for a summary of the historic environmental impacts from the operations of the Cross Island facility.

- 2. Proposal - The permittee proposes to utilize the 25-acre lease by continuing to stocking the site with North American Atlantic salmon (*Salmo salar*) only. According to the permittee's MEPDES permit application, the net pen configuration will consist of 24 polar circles each measuring 100 meters in circumference by 8 meters deep. See Attachmen tB of this Fact Sheet for the proposed pen configurations. A summary of some of the operational and site conditions are as follows:

Water depth in pen areas @MLW:	≈10 – 14.5 meters
Minimum clearance from pen to sea floor	3 meters
Sea floor composition	Silty gravel
<u>Current:</u>	
1/2 way between sea floor and net bottom	6.7 cm/s (measured Fall/06)
Baseline monitoring conducted	Fall 2006

	<u>Atlantic salmon</u>
Maximum number of fish/pen	55,000 smolt, 28,000 mature
Maximum biomass of fish/pen	159,200 kg
Pen volume (individual)	6,369 m ³
Stocking Density	20 kg/m ³ - 30 kg/m ³
Maximum feeding rate	925,575 kg/month
Maximum feed/year	4,585,000 kg
Feed Conversion Ratio (FCR)	1.1 - 1.5 kg feed/kg fish

2. REGULATORY AUTHORITY

- a. Maine Department of Environmental Protection - A permit for the operation of a finfish aquaculture facility is required pursuant to Maine Law, 38 MRSA section 413(10) and the Department's rules, Chapter 521(7). Maine law, 38 M.R.S.A. Section 414-A, requires that the effluent limitations prescribed for discharges require application of best practicable treatment, 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

2. REGULATORY AUTHORITY (cont'd)

Regulation Chapter 530, *Surface Water Toxics Control Program*, requires the regulation of toxic substances at the levels set forth for Federal Water Quality Criteria as published by the U.S. Environmental Protection Agency pursuant to the Clean Water Act.

On January 12, 2001, the Department received authorization from the U.S. Environmental Protection Agency (EPA) to administer the National Pollutant Discharge Elimination System (NPDES) program in Maine. From this point forward, the program will be referenced as the MEPDES program and will utilize a permit number of #ME0110507 as the primary reference number for ASM's Cross Island MEPDES permit.

- b. Maine Department of Marine Resources (DMR) - Pursuant to 12 MRSA, subchapter II and 13-188 CMR, Chapters 2 and 24, the DMR has regulatory authority over these facilities. The DMR may issue leaseholds for the location and operation of aquaculture operations after considering, among other things, the effects on navigation, fishing, rights of riparian owners, natural resources and public uses. The DMR further regulates the transfer of fish into marine aquaculture operations and has responsibility for fish health issues. Finally, the DMR conducts monitoring in and around aquaculture location through its Finfish Aquaculture Monitoring Program or "FAMP".

Under Maine law, 12 MRSA, section 6072 (7-A), the DMR is required to make the following findings prior to granting a lease for an aquaculture facility:

1. The facility will not unreasonably interfere with the ingress and egress of riparian owners;
2. The facility will not unreasonably interfere with navigation;
3. The facility will not unreasonably interfere with fishing or other uses of the area taking into consideration the number and density of aquaculture leases in an area. For the purposes of this paragraph, "fishing" includes public access to a redeemable shellfish resource, as defined by the Department, for the purpose of harvesting, provided that the resource is commercially significant and subject to a pollution abatement plan that predates the lease application, that includes verifiable activities in the process of implementation and that is reasonably expected to result in the opening of the area to the taking of shellfish within 3 years;
4. The facility will not unreasonably interfere with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna;
5. The applicant has demonstrated that there is an available source of organisms to be cultured for the lease site; and

2. REGULATORY AUTHORITY (cont'd)

6. The lease does not unreasonably interfere with public use or enjoyment within 1,000 feet of municipally owned, state owned or federally owned beaches and parks or municipally owned, state owned or federally owned docking facilities.”

These considerations are similar to, or more stringent than, those necessary to determine if the narrative water quality are met, and represent the findings of another State agency having expertise in these matters. In the absence of other information, the Department of Environmental Protection would normally place significant weight on the DMR's findings. Similarly, the US Army Corps of Engineers is considered to be experts on issues of navigation.

On September 2, 1997, the DMR issued an Aquaculture Lease to Atlantic Salmon of Maine LLC for five parcels of submerged land totaling 25 acres off the northwest shore (Northwest Harbor) of Cross Island in the Town of Cutler. The DMR has assigned numbers 576-07, 577-07, 578-07, 579-07 and 580-07 to the 25-acre parcel as individually described by meets and bounds in the lease. The DMR has assigned a site designation of ASM-CI for the 25-acre lease site. The lease expires on September 1, 2007.

- c. U.S. Army Corps of Engineers (ACOE) - The ACOE acting pursuant to Section 10 of the Rivers and Harbors Act of 1899, permits the installation of net pen containment systems in which aquaculture activities are conducted. On March 16 1989, the ACOE issued permit #ME-CRIS-872004-R-89 to ASM for the placement of floating fish pens structures within said site.

3. WATER QUALITY CLASSIFICATION STANDARDS

Maine law, 38 M.R.S.A., §469 states that the marine waters in an around the 25-acre DMR lease site are classified as Class SB waters. Maine law, 38 M.R.S.A., §465-A(2) states;

Class SB waters shall be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hyroelectric power generation and navigation and as habitat for fish and other estuarine and marine life. The habitat shall be characterized as unimpaired.

The dissolved oxygen content of Class SB waters shall be not less than 85% of saturation. Between May 15th and September 30th, the numbers of enterococcus bacteria of human origin in these waters may not exceed a geometric mean of 8 per 100 milliliters or an instantaneous level of 54 per 100 milliliters. The numbers of total coliform bacteria or other specified indicator organisms in samples representative of the waters in shellfish harvesting areas may not exceed the criteria recommended under the National Shellfish Sanitation Program Manual of Operations, Part I, Sanitation of Shellfish Growing Areas, United State Department of Food and Drug Administration.

3. WATER QUALITY CLASSIFICATION STANDARDS (cont'd)

Discharges to Class SB waters shall not cause adverse impact to estuarine and marine life in that the receiving waters shall be of sufficient quality to support all estuarine and marine species indigenous to the receiving water without detrimental changes in the resident biological community. There shall be no new discharge to Class SB waters which would cause closure of open shellfish areas by the Department of Marine Resources.

Maine law, 38 MRSA, Section 464 (4)(F) contains the State's antidegradation policy. The law states that existing discharges must, among other things, not cause existing uses or cause the classification standards to be violated. In addition, waters of higher quality must be maintained at that level. Water quality monitoring information from the FAMP will be used to assist the Department in evaluating existing facilities.

4. POTENTIAL WATER QUALITY IMPACTS

Finfish aquaculture facilities can cause changes in the immediate area of the net pens. Some deposition of material, primarily uneaten feed and feces, on the sea floor directly beneath and adjacent to net pens can be expected. This permit makes provisions for some adverse impacts within the benthic mixing zone, but all classification standards must be maintained outside the mixing zone. The deposition of organic materials on the sea floor can, through decomposition, result in depletion of oxygen in the sediments composing the sea floor. This, in turn, can render the area unsuitable for a normal number and diversity of natural organisms. Such conditions, which may occur in varying degrees, may be evidenced by reduced Redox Potential, the formation of gas in the sediment, the predominance of undesirable organisms or the loss of certain species. Since most of the accumulating material is biodegradable through natural processes, the reduction or suspension of aquaculture activities (fallowing) is anticipated to allow mitigation of benthic impacts without long term impacts.

The large number of fish in the net pens may, within the immediate water column, reduce dissolved oxygen concentrations due to respiration. The result may be DO saturation standards not being achieved under all conditions during the summer months. However, it should be noted that minimum dissolved oxygen concentrations measured by DMR's FAMP program have been more than adequate to sustain all marine life. This permit establishes a minimum dissolved oxygen concentration of 6.0 mg/L within the water column mixing zone and the saturation levels prescribed by the respective classification standards must be maintained outside the mixing zone at all times.

4. POTENTIAL WATER QUALITY IMPACTS (cont'd)

Aquaculture facilities may harbor diseases or parasites that could spread to native organisms or farmed fish at other aquaculture facilities. The use of disinfectants is a necessary part of preventative practices, and the Department supports their use consistent with recommendations of fish health authorities. However, the use of medications and disinfectants pose potential concerns for toxicity if discharged in excessive amounts. These effects include acute toxicity to non-target aquatic organisms in the immediate area of use, chronic effects on benthic organisms and bioaccumulation in the food chain.

The placement of net pens in the water does limit certain narrative uses of the water body. These concerns include fishing and navigation. Aesthetic concerns including visual impacts, noises from the operation of equipment and boat traffic, have also been raised. These arise from the physical placement of the pens, not discharge activities, and are therefore not subject to regulation as pollutant discharges under this permit. However, the DMR lease approval process and the US Army Corps of Engineers permit for the Cross Island aquaculture operations considered these topics such that the public concerns and interests are protected.

In November, 2000, the National Marine Fisheries Service and the United States Fish & Wildlife Service (collectively, the "Services") issued a final rule listing Atlantic salmon populations in certain Maine rivers and streams as "endangered" under the federal Endangered Species Act (ESA). The listing identified several risks to Atlantic salmon posed by the finfish aquaculture industry, including potential spread of diseases, and the potential that escaped cultured fish could disrupt reproduction of river populations of Atlantic salmon. The State of Maine initially appealed the ESA listing but subsequently dropped the appeal upon entering into negotiations with the Services to develop a comprehensive restoration plan.

This permit contains conditions for the Cross Island operations in three primary areas: 1) loss prevention through audited containment practices, 2) marking of fish to identify the origin of any fish that may escape, and 3) use of only North American strains of Atlantic salmon. These, as well as other related conditions are proposed to be consistent with the minimum requirements of the Services and have been included in the permit to satisfy requirements in Maine's NPDES authorization. As to findings of compliance with the condition regarding the use of North American strains, the Department intends to consult further with the Services and other affected parties to make these determinations. The Department has considered each of these potential impacts and developed permit limits to address or control each. It is noted ASM has submitted copies of its Containment Management Plan (January 7, 2003) and Hazard Analysis Critical Control Point (HACCP) plan to the Department and indicated in their February 2007 application that it has a Spill Prevention & Countermeasure Control (SPCC) plan for the facility.

5. SITE CONDITIONS

A document entitled, State of Maine Department of Environmental Protection, 2004 Integrated Water Quality Monitoring and Assessment Report, published by the Department indicates Machias Bay is attaining the standards of its ascribed classification.

Baseline sampling for the original DMR lease (issued December 17, 1987) was never conducted. The DMR's FAMP video monitoring conducted in September of 2002 indicated excess materials were being deposited on the sea floor of the site resulting in the growth of moderate to high amounts buggiatoa resulting in gassing, and that benthic infauna analysis should be reviewed prior to restocking. It is noted the site has been fallow as of October 2003. In the fall of 2006, ASM contracted with MER Assessment Corporation to conduct new baseline monitoring. The Department and DMR have reviewed the information and determined the conditions at the site are currently suitable for the restocking of fish.

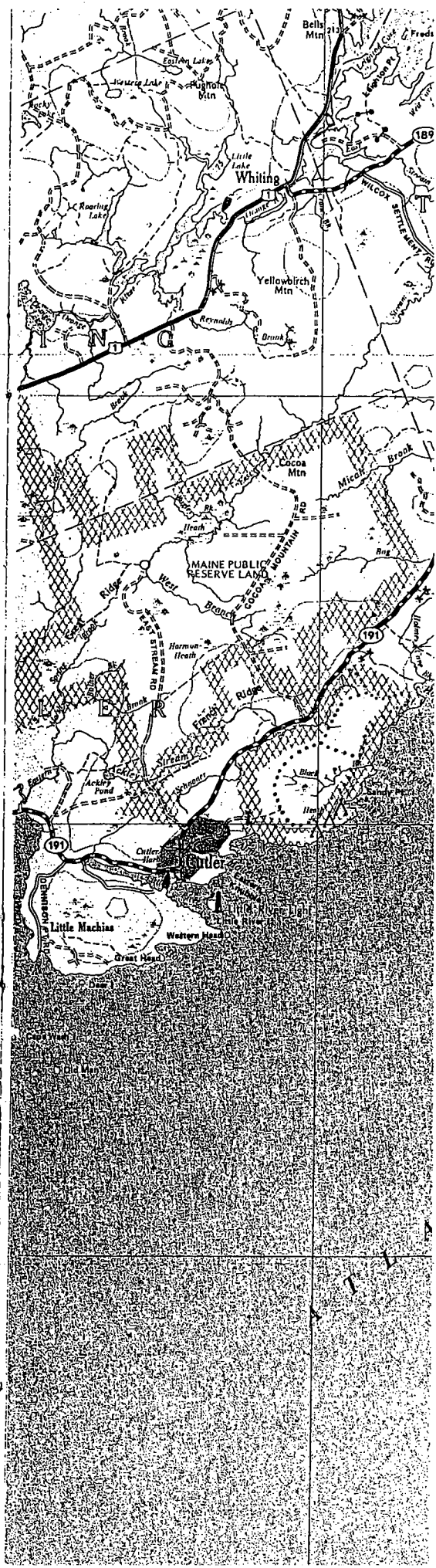
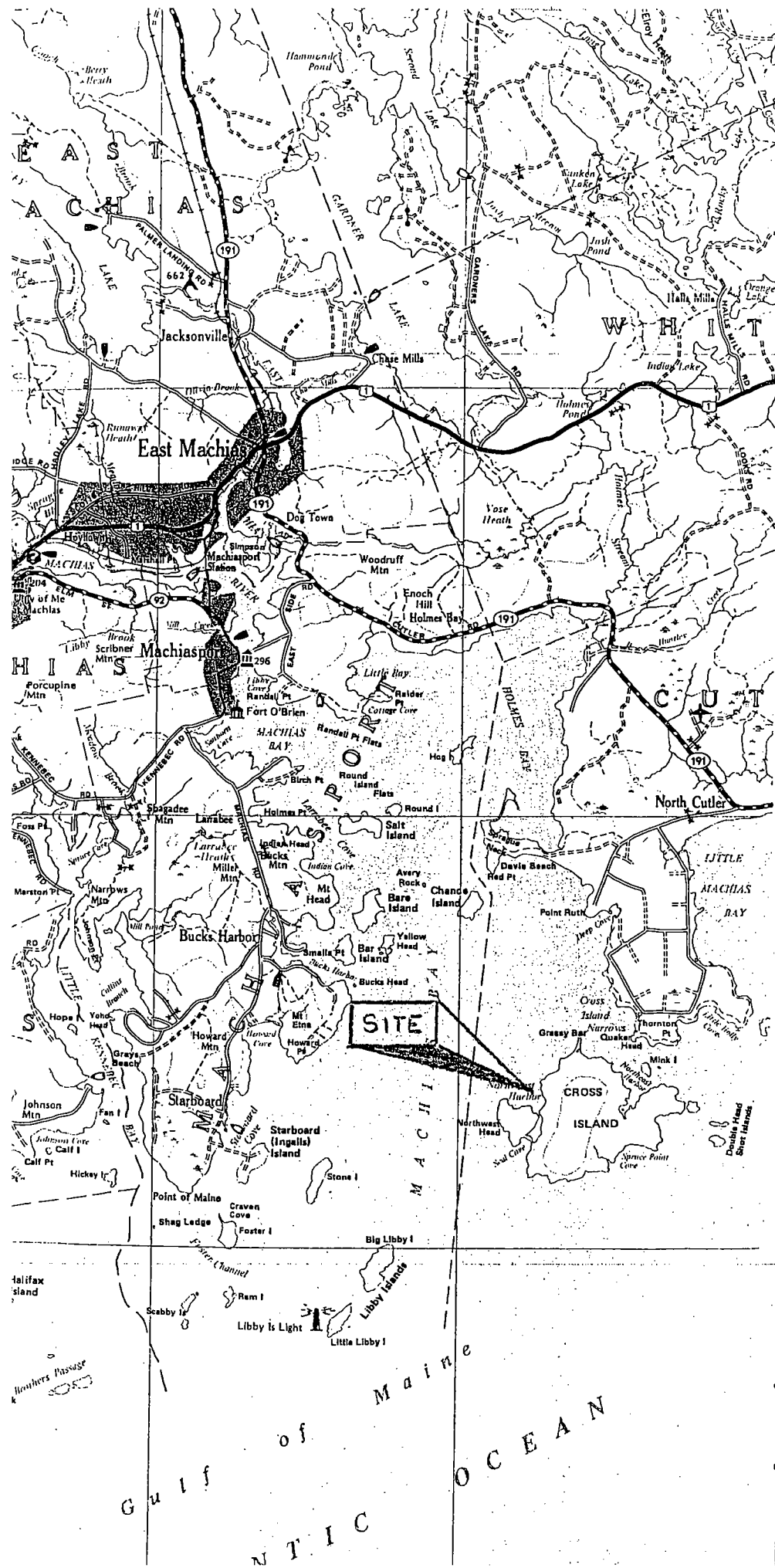
To document the improvements and taking into consideration the sensitivity of the site to adverse benthic impact, this permitting action is requiring the permittee to conduct seasonal (June 1 – October 31) monthly video monitoring for the pens stocked with adult/market sized Atlantic salmon. See Special Condition E.7. of this permit. This routine monitoring is in addition to the semi-annual FAMP. The routine monitoring frequency of 1/Month may be modified after two years of monitoring if the warning levels specified in Special Condition G are not exceeded and there are no other indications of impact from the facility.

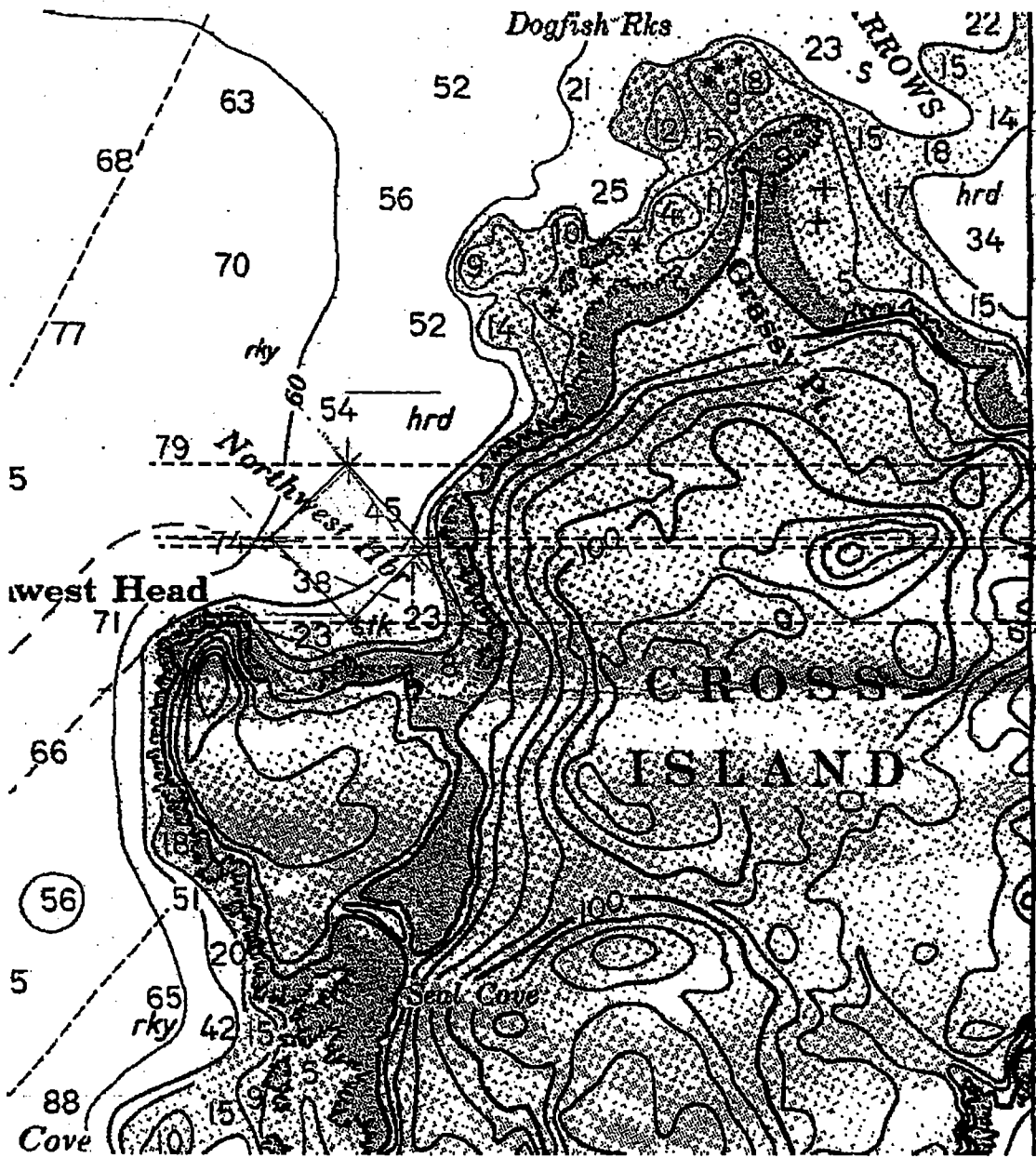
6. SUMMARY OF EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

This permitting actions establishes:

- a. A water column mixing zone extending out 30 meters beyond the perimeter of the net pen.
- b. A sediment mixing zone extending out 30 meters beyond the perimeter of the net pen.
- c. Seasonal far-field ambient water quality monitoring.
- d. Seasonal near-field ambient water quality monitoring.
- e. Sediment and benthic monitoring programs.
- f. Numeric impact thresholds for sediments and the benthic community.
- g. Seasonal Finfish Aquaculture Monitoring Program (FAMP) and routine video and photographic monitoring.
- h. A prohibition on the stocking of any Atlantic salmon originating from non-North American stock.

ATTACHMENT A





(JOINS CHART 132)

372.3
365.6
364.8

440
3

ATTACHMENT B

Cross Island

