

## **Additional Information Requirements for Aquaculture Facilities**

Pursuant to Section 5(2) of the *Environmental Impact Assessment Regulation* of the Clean Environment Act, this document is intended to assist proponents in preparing a registration submission for projects involving the above-mentioned sector. It should be read in conjunction with the General Information Requirements as outlined in the latest version of the Registration Guide. Note that the following items are requirements **in addition to** those outlined in the Registration Guide. The information requested in the Registration Guide must also be provided. For further assistance, please contact the Project Assessment and Approvals Branch, Department of Environment at (506)-444-5382.

After reviewing a registration submission, the Technical Review Committee may require other information beyond the items listed below and in the Registration Guide.

Note: If your project involves any of the following components please contact the Canadian Environmental Assessment Agency, Atlantic Region at (902) 426-0564 to determine if your project requires a comprehensive study under the Canadian Environmental Assessment Act: a) extraction of 200 000 m<sup>3</sup>/a or more of groundwater, or b) diversion of water from a natural water body into another water body.

### **Definition**

This guideline is applicable to land-based or marine-based aquaculture facilities that require registration under the *Environmental Impact Assessment Regulation*. Registration for these projects is typically triggered by water withdrawal, wastewater treatment, introduction of a non-native species, or by the presence of rare, unique or endangered environmental features that may be affected by the project.

A complete list of potential triggers for project registration is provided in Schedule "A" of the Regulation. To determine if registration is required for a specific project, please contact the Project Assessment and Approvals Branch at the number listed above.

### **1.0 THE PROPONENT**

See Registration Guide.

### **2.0 THE UNDERTAKING**

#### **(ii) Project Overview:**

- Provide an indication of the species that will be raised, as well as its source. Is this species native to New Brunswick ?

- Would genetically modified species be utilized?

(v) Siting Considerations:

- If the project is located in a coastal area, indicate how the project will adhere to the *New Brunswick Coastal Areas Protection Policy*. (<http://www.gnb.ca/0009/0371/0002/0001-e.asp>)

(vi) Physical Components and Dimensions of the Project:

Provide a detailed description of the proposed project, addressing the requirements contained in the Registration Guide. For this class of project the required information includes but is not limited to the following:

- Ensure that the site plan includes all proposed project components including ancillary features such as parking lots, access roads, water supplies, pumps and pipelines, structures for withdrawal from or discharge to receiving waters, wastewater treatment facilities, associated commercial facilities, etc.
- Specify the capacities of all proposed pumps used to obtain the facility's water supply.

(viii) Operation and Maintenance Details:

Provide a detailed description of the proposed project's operation and maintenance characteristics, addressing the requirements contained in the Registration Guide. For this class of project the required information includes but is not limited to the following:

- Provide details about anticipated effluent, including (but not limited to) its quantity, how it will be treated, where it will be discharged and what its expected quality will be (including but not limited to levels of phosphorus).
- Provide plans for waste disposal, including the disposal of used chemicals and fish mortalities.
- Provide a waste disposal contingency plan in the event of a system failure resulting in massive stock loss. Name the company or companies that would be contracted to dispose of the dead fish.
- Provide a rearing plan, including (but not limited to) the number of fish raised per year, and the total biomass.
- Describe the expected maximum amount of feed per day and the feeding regime.
- Provide an indication of the methods that will be used to ensure the absence of disease.

- Identify all the chemicals that will be used and the potential adverse environmental effects stemming from their use.
- Describe the proposed method of chemical storage. Note that the facility design should provide for adequate containment of stored chemicals so as to prevent release to the environment in the event of a spill. Ideally this would include chemical storage areas with containment capability.
- Any required fish net cleaning operations should be identified. Where on site will the cleaning occur?
- Where will old or unusable equipment be stored or discarded ?
- Identify the type of operation that is being proposed: a) “flow-through”, b) “re-circulating” or c) a combination)of both. Provide a rationale for the chosen type.
- Provide an estimate of annual water use (broken down by month) and state the assumptions used to calculate this.
- Please note that if water withdrawal from a watercourse is anticipated, the federal Department of Fisheries and Oceans’ “Freshwater Intake End of Pipe Fish Screen Guidelines” must be followed.
- Additional, specific information requirements about the faculty’s water supply and waste disposal systems may apply. See “Other Applicable Guidelines” at the conclusion of this document.
- See also Typical Environment Canada Concerns and Recommendations for Marine Aquaculture Operations attached to this document as Appendix 1

### **3.0 DESCRIPTION OF EXISTING ENVIRONMENT**

Include all relevant environmental features as noted in the Registration Guide. Examples of issues that may be of particular relevance to this class of project include but are not limited to the following:

- The existing quality of receiving waters for effluent, including but not limited to its dilution capabilities, oxygen concentration, temperature, pH, depth, etc.), and a description of its fish habitat;

- For facilities in marine environments, the current speed and direction, tidal ranges and wave patterns; and
- The location of other aquaculture or fishery activities in the vicinity of the project.

#### **4.0 SUMMARY OF ENVIRONMENTAL IMPACTS**

All anticipated impacts should be described and discussed. These will depend on the scope and complexity of the project as well as the project location. See the Registration Guide for further information. Examples of impacts resulting from this class of project may include but are not limited to the following:

- The possible effects of any effluent discharge into receiving waters. For facilities in marine environments, what will be the likely dispersion pattern of wastes from the pens ?
- Impact on adjacent activities - Will the facility interfere with other aquaculture or fishery-related activities ?
- Predation controls - If acoustical deterrents will be employed to protect the fish from predation, what will be the impact of these measures on other aquatic life ?
- Impact on marine traffic - Will the facility have an impact on vessel movements or navigation ?

#### **5.0 SUMMARY OF PROPOSED MITIGATION**

Describe all mitigative measures that will be employed to minimize the potential environmental impacts identified above. These may include but are not limited to the following:

- proposed mitigation for the possible adverse environmental effects stemming from the use of chemicals in the facility;
- mitigation to reduce impact on adjoining beaches or coastal areas;
- measures that will be used to prevent fish from escaping into the environment; and
- measures to prevent the spread of disease into the natural environment.

#### **6.0 PUBLIC INVOLVMENT**

See Registration Guide.

## **7.0 APPROVAL OF THE UNDERTAKING**

See Registration Guide.

## **8.0 FUNDING**

See Registration Guide.

## **9.0 SIGNATURE**

See Registration Guide.

## **10.0 SUBMISSION INSTRUCTIONS**

See Registration Guide.

## **OTHER APPLICABLE GUIDELINES**

- Proponents should consult the documents Additional Information Requirements for Wastewater Treatment Projects and Additional Information Requirements for Waterworks and Water Supply Projects, as well as DELG's Guide to the Water Supply Source Assessment Process, to see if they are applicable to the project.
- See also Typical Environment Canada Concerns and Recommendations for Marine Aquaculture Operations attached to this document as Appendix 1
- The following aquaculture EA guides are available at <http://atlantic-web1.ns.ec.gc.ca/ea-ee/Default.asp?lang=En&n=437448D5-1> :

Environment Canada (Atlantic Region. 2001). Environmental Assessment of Marine Finfish Aquaculture Facilities: Guidelines for Consideration of Environment Canada Expertise.

Environment Canada (Atlantic Region. 2001). Environmental Assessment of Freshwater Aquaculture Facilities: Guidelines for Consideration of Environment Canada Expertise

Environment Canada (Atlantic Region. 2001). Environmental Assessment of Shellfish Aquaculture Facilities: Guidelines for Consideration of Environment Canada Expertise

Environment Canada (Atlantic Region. 2001). Environmental Assessment of Land-Based Freshwater Aquaculture Facilities: Guidelines for Consideration of Environment Canada Expertise

## Appendix 1

### Typical Environment Canada Concerns and Recommendations for Marine Aquaculture Operations

**This Appendix has been prepared by Environment Canada**

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#### **Potential for Disposal at Sea and Waste Management**

The project description should provide information on waste management methods to deal with disposal of waste generated from the construction and operation with an emphasis placed on alternative uses for waste products and materials. It is important to note that the ocean disposal of fish mortalities and offal, as well as shells from an aquaculture operation requires a Disposal at Sea Permit under the *Canadian Environmental Protection Act 1999*. 'Harrowing' under the cage sites is considered disposal at sea activity and would require a Disposal at Sea Permit.

Mr. Rick Wadman can be contacted at (709)-772-4269 for further information on the requirements and timeline for obtaining a Disposal at Sea permit. EC is responsible for ensuring an environmental assessment (EA) is conducted of the proposed disposal at sea activity before it can reach a decision on issuing a permit.

#### **Canadian Shellfish Sanitation Program**

Under the Canadian Sanitary Shellfish Program (CSSP), EC is responsible for monitoring bacteriological water quality in designated shellfish growing areas. EC also conducts sanitary shoreline surveys to identify point and non-point sources of bacterial contamination. Based on the results of these surveys, EC makes recommendations to the Atlantic Shellfish Growing Area Classification Committees on the suitability of coastal waters for the harvesting of molluscan shellfish.

The Shellfish Water Quality Protection Program also actively promotes pollution prevention, remediation and restoration of shellfish growing areas. As a partner in delivering the CSSP, the Canadian Food Inspection Agency (CFIA) regularly tests commercially harvested shellfish for bacterial contamination and maintains a marine biotoxin surveillance program of shellfish growing areas. DFO is responsible for closing, opening and patrolling shellfish growing areas.

#### Water Quality Monitoring

Point and non-point sources of pollution are a potential source of contamination. This reflects the importance of an on-site water quality monitoring program in addition to the CSSP. The Shellfish Water Quality Program only measures bacterial water parameters. Other important parameters to include in a monitoring program are phytoplankton abundance, salinity, pH, dissolved oxygen and temperature.

#### Other Closures

CSSP recommends a 300m (minimum) closed shellfish harvesting area near major pollution point source discharges such as sewage and outfalls and a 125 m (minimum) closed shellfish harvesting area near permanent or floating structures such as wharves, docks, and marinas. These recommendations are legislated in the Atlantic Region through the Department of Fisheries and Oceans' *Management of Contaminated Fisheries Regulations*.

## Use of Chemicals in the Aquatic Environment

Chemicals used in the aquaculture industry include therapeutants, pesticides, feed additives, hormones, anesthetics, and disinfectants. The environmental consequences of chemical usage in aquaculture have been the subject of several scientific investigations<sup>1</sup>.

In 2000, a list of 75 chemicals used in aquaculture was compiled based on many interviews and questionnaires with individuals involved in the industry<sup>2</sup>. Based on this list, a risk ranking was conducted<sup>3</sup>. The chemicals which pose the greatest risk to the aquatic environment in the vicinity of aquaculture operations were identified in the following order:

1. Emamectin benzoate (SLICE)
2. Ivermectin
3. Azamethiphos (sea lice control chemicals)
4. Copper, copper oxide (net antifoulants)
5. Formaldehyde
6. Chloramine T (antiparasitics)
7. Malachite green (antifungal)
8. Ormetoprim (antibiotic)
9. Sodium hypochlorite
10. Hydrogen peroxide (disinfectants).

The survey revealed the use of several potential endocrine-disrupters in the aquaculture industry which is of concern to EC. The overall potential for endocrine disruption and other environmental impacts from these chemicals used in aquaculture are still largely unknown.

All pesticides products used on site must be registered for the intended use under the *Pest Control Products Act* and must be applied in accordance with the prescribed label requirements. A description of the use patterns for each chemical product would be helpful in evaluating potential deleterious effects on water quality and non-target organisms. The proponent should demonstrate that mitigation measures will be put in place to avoid negative environmental effects on water quality and non-target organisms resulting from the use of chemicals. A description of proposed follow-up monitoring subsequent to the release of these highly toxic chemicals should be provided for review. Efforts directed at early detection of disease of aquatic organisms in the aquaculture setting would assist in eliminating the need to use these chemicals and reduce the risk to the aquatic environment. The proponent should contact the Pesticide Management Regulatory Agency of Health Canada at 1-800-267-6315 for toll free information.

## New Substances Notification Regulations

The New Substances Notification Regulations (NSNR) stipulate the information that must be submitted to EC **prior** to the import or manufacture of any new substance in Canada. The sole basis for determining if a substance is new is the Domestic Substances List (DSL), which is a list of approximately 24 000 substances that are presently in Canadian commerce. A 'substance' can include chemicals, polymers, micro-organisms or organisms (this would include genetically modified or non-indigenous animals, bacteria, enzymes, fish, etc., that are new to Canada). For more

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<sup>1</sup> Burridge, L.E. 2003. A Review of Current Practices and Possible Environmental Effects. A Scientific Review of the Potential Environmental Effects of Aquaculture in Aquatic Ecosystems, volume 1, 97-125. Canadian Technical Report of Fisheries and Aquatic Sciences 2450, Fisheries and Oceans Canada.

<sup>2</sup> Muise B. and Associates. 2000. Chemical Use by the Eastern Canadian Aquaculture Industry. Environment Canada, Pollution Prevention Division, Environmental Management and Technology Section, Atlantic Region.

<sup>3</sup> Cantox Environmental Inc. 2001. Scoring and Ranking of Chemicals used in Regional Aquaculture Operations in Atlantic Canada Based on Ecological Risk Potential. Environment Canada, Pollution Prevention Division, Environmental Protection Branch, Atlantic Region.

information on this regulation, please contact Kim Kennedy at (902) 426-8927 or visit [www.ec.gc.ca/substances](http://www.ec.gc.ca/substances). This website contains the documents Guidelines for the Notification and Testing of New Substances: Chemicals and Polymers and Guidelines for the Notification and Testing of New Substances: Organisms, as well as a searchable DSL.

### Prohibitions against Deposition of Harmful or Deleterious Substances

Chemicals, including disinfectants (e.g., Wescodyne), may be considered deleterious to the aquatic environment. In this regard, the proponent should be made aware that the deposit of a deleterious substance into waters frequented by fish is prohibited (Section 36, *Fisheries Act*). In addition, the proponent should be aware that under the *Migratory Bird Convention Act* (MBCA) and *Regulations*, “no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.” To reduce the risk of *Fisheries Act* (Section 36) or MBCA violations, chemicals and disinfectants should be contained, re-used, and/or disposed of on land for proper treatment in accordance *with all applicable requirements*.

### **Net Cleaning**

Net cleaning liquid and solid wastes to be disposed of should be analyzed for potential contaminants (e.g., copper) total and leachate concentrations, respectively. If classified as hazardous under the *Transportation of Dangerous Goods Regulations*, the transportation of such wastes must comply with the safety requirements identified under these Regulations and must only be disposed of at facilities authorized to receive and disposed of hazardous wastes. Provincial Departments of the Environment should be consulted prior to sending the hazardous wastes for disposal for additional direction in this regards.

In addition, hazardous wastes to be transported through provincial borders are required to be in compliance with *the Interprovincial Movement of Hazardous Waste Regulations* (i.e., requiring the hazardous wastes to be manifested) and hazardous wastes to be exported to countries other than Canada) are required to be in compliance with the *Export and Import of Hazardous Waste Regulations* (i.e., requiring appropriate documentation such as notification, export permit, manifest, etc.).

### **Wildlife and Wildlife Habitat**

The EA should include a description of the use of the study area by wildlife (e.g. migration, feeding, wintering, breeding), and describe the adverse effects that could result from the project. Measures to mitigate potential deleterious effects on these species as well as a follow-up monitoring plan, should also be provided in the EA.

In general, the Canadian Wildlife Service (CWS) of EC has several concerns relating to finfish aquaculture, including:

- potential for lost staging and wintering seabird/duck habitats;
- possible displacement and/or interruption of migration related to the increased food source;
- possible predation by fish-eating bird species (e.g. gulls, mergansers);
- possible increase of nuisance species (e.g. gulls), and related problems (e.g., increased competition for other birds and species at risk such as terns);
- potential to effect hunting opportunities; and
- potential for spreading disease to wild fish stocks, which may adversely affect seabirds that ingest diseased fish.

Migratory birds, their nests, eggs, and young are protected under the *Migratory Birds Convention Act* (MBCA) and *Regulations*. The proponents should be reminded that they are expected to comply with the *Migratory Birds Convention Act* and *Regulations* during all project phases. Migratory birds include those species listed in the CWS Occasional Paper *Birds protected in Canada under the Migratory Birds Convention Act*.



The proponents should also be aware that under the *Migratory Birds Regulations*, “no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.”

Several management options that can help facilitate compliance with the MBCA are discussed in EC’s guidance document. These management options provide proponents with the flexibility needed to adjust site design, operating practices and the timing of certain activities so as to avoid sensitive periods and important habitat areas for migratory birds. Proponents should also be mindful of the need to make provisions for waste management that will minimize both the attraction and disturbance of migratory birds and species of special conservation concern. The following are among the best management practices that should be incorporated into the planning and operation of the aquaculture sites:

- only main navigation channels should be used;
- concentrations of seabirds, waterfowl or shorebirds should not be approached when anchoring equipment, accessing wharves, or ferrying supplies;
- all vessels and machinery should be well muffled;
- equipment should not be stored or repaired on beaches;
- Safe roosting and perching places should be eliminated on site;
- Increasing the depth of the containment units below the surface of the water may reduce the attraction of surface-feeding birds such as gulls (note: Gulls are considered a migratory bird and are protected under the MBCA);
- Locating young/small stock which are more vulnerable to predation to an area where they are less accessible to predatory birds;
- Placing good quality protective netting on the sides and tops of cages to protect fish stock from bird and mammalian predation. Top nets must be placed, installed and adjusted so that they do not sag under the weight of preying birds;
- Underwater, anti-predator nets may be required in some locations. Bag-type nets offer protection to all sides of the cage, including the bottom. Nets should be placed as far from the cages as possible and weighted to prevent them from being pushed together by water movement. A mesh size which will help prevent tangling of birds should be selected. Bright colored nets may also reduce the likelihood of birds accidentally swimming into nets.
- Beach clean up activities should not be undertaken during sensitive periods for migratory birds;
- Keeping the site free of waste and mortalities during operation will reduce the attraction of birds and other wildlife.

If there is any noticeable change in seabird numbers or distribution in the area of the aquaculture facilities, the proponent should record species and numbers if possible and should report this information to Holly Hogan at the CWS (709-772-2194).

#### Scare Policy

Scare permits will be issued only under the following conditions:

- potential interactions with migratory birds at the aquaculture site was considered during project planning and CWS is satisfied that adequate avoidance strategies were incorporated into siting and operational planning; and
- at the time of request for a scare permit, the aquaculture operator is operating within the approved siting and operational design; and

- at the time of request for a scare permit the aquaculture operator demonstrates to CWS that effective depredation technology is being used or is soon to be used in the operation; and
- scare permits can be issued within the restrictions respecting provincial and municipal laws regarding the discharge of firearms. Permits will require the use of non-toxic shot or “bangers”.

### Species at Risk

The *Species at Risk Act* (SARA) has resulted in a consequential amendment to CEAA that amends the definition of “environmental effect” to clarify that all federal EAs must always consider adverse effects on listed wildlife species, and the critical habitat or residences of individuals of those species. In addition, section 79(2) of SARA requires that when a federal EA is carried out on a project that may affect a listed species or its critical habitat, adverse environmental effects must be identified, mitigation measures must be taken to avoid or lessen adverse effects, and environmental effects monitoring must be conducted.

Pursuant to Section 79(1) of SARA, if any listed wildlife species, its critical habitat or the residences of individuals of that species may be adversely impacted by the project, the Responsible Authorities for the CEAA assessment must notify the competent Minister responsible for the listed species in writing. Any notification resulting from this project may be sent to the attention of Holly Hogan at CWS (709-772-2194).

One of the purposes of SARA is to manage species of special concern to prevent them from becoming endangered or threatened. In this context, we also recommend that the federal EA consider potential impacts on any species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

### Site Access and Habitat Loss

#### *Wetlands*

According to *The Federal Policy on Wetland Conservation*, 65% of Atlantic coastal salt marshes have already disappeared. As part of its commitment to wetland conservation, the Federal Government has adopted *The Federal Policy on Wetland Conservation* with its objective to “promote the conservation of Canada’s wetlands to sustain their ecological and socio-economic functions, now and in the future.” In support of this objective, the Federal Government strives for the goal of No Net Loss of wetland function on federal lands or when federal funding is provided. Furthermore, according to *The Federal Policy on Wetland Conservation - Implementation Guide for Federal Land Managers*, “Due to local circumstances where wetland losses have been severe, in some areas no further loss of any remaining wetland area may be deemed essential.” During all project phases, the proponents should ensure that wetlands or sensitive coastal habitats are not accessed by equipment; are not used as staging areas; and, are not infilled.

#### *Bottom Habitat*

Other areas of potential habitat loss can include bottom habitat. For example, eelgrass is widely viewed by terrestrial and aquatic scientists as being a keystone species in the coastal marine ecosystem<sup>4</sup>. To help ensure the viability of these habitats is maintained, further information should be collected on the currents and dispersion characteristics at these sites. Accumulation of sediments beneath the growing sites should also be visually inspected and monitored regularly. Marine vegetation in shallow areas should be monitored for any changes or impacts from the aquaculture operations.

### **Effects of the Environment on the Project**

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<sup>4</sup> Gregory, R. and A. Locke. 2004. Status and Conservation of Eelgrass (*Zostera marina*) in Eastern Canada. Canadian Wildlife Service, Environmental Conservation Branch, Environment Canada, Atlantic Region.

Consideration of effects of the environment on the project, as required under CEAA, is an important component of the EA of any aquaculture project. A discussion of the vulnerabilities of the project with respect to various climate elements (wind, waves, ice, fog, etc.) should be included for review. Extremes, rather than means, are most pertinent; these are what the project design and the operator must be prepared to handle. Based on an analysis of these factors, mitigative procedures should be factored into the design to ensure that infrastructure damage and other accidents will not occur. Proven technologies and operator's experience are important, but are not guarantees. It is important that the data selected to document these discussions be representative of conditions in the area of the project.

The climatological investigation should not be limited to monthly means, but should include the following:

- ice conditions including the degree and seasonality of ice cover, ice drift velocity and associated stresses on structures;
- wind climatology including the frequency of wind speeds above operational thresholds, as well as the return periods for extreme and design events;
- fog climatology as fog can affect operations and marine navigation; and
- wave height climatology including return periods for extreme waves and design waves (while this information may not be available for specific areas, it can be derived from local wind data).

The following information sources may be consulted for consideration of effects of the environment on the project:

<b>Information</b>	<b>Source</b>
<b>Climatological Data</b>	EC's Atlantic Climate Centre: Environment Canada, Atlantic Climate Centre 77 Westmorland Street, Suite 400 Fredericton, NB E3B 6Z3  Phone: NB: (506) 451-6006 Phone: NS and PEI: (902) 426-9226 Phone: NL: (709) 772-4695 Fax: (506) 451-6010 E-Mail: <a href="mailto:climate.atlantic@ec.gc.ca">climate.atlantic@ec.gc.ca</a>  Normally a charge for data (increases with the amount of post-processing required).
<b>Sea Ice Data</b>	EC's Canadian Ice Service: Client Services 373 Sussex Dr., Block E, 3rd Floor Ottawa, Ontario K1A 0H3  Phone: (613) 996-1550 or toll-free in Canada 1-800-767-2885 Fax: (613) 947-9160 E-Mail: <a href="mailto:cis-scg.client@ec.gc.ca">cis-scg.client@ec.gc.ca</a> Website: <a href="http://ice-glaces.ec.gc.ca/">http://ice-glaces.ec.gc.ca/</a>
<b>Wave Data</b>	Marine Environmental Data Service Department of Fisheries and Oceans W12082 - 200 Kent Street Ottawa, Ontario Canada K1A 0E6  General Inquiries: (613) 990-6065 / Request Services: (613) 990-0243 Fax Number: (613) 993-4658  E-mail: <a href="mailto:services@meds-sdmm.dfo-mpo.gc.ca">services@meds-sdmm.dfo-mpo.gc.ca</a> < <a href="mailto:services@meds-sdmm.dfo-mpo.gc.ca">mailto:services@meds-sdmm.dfo-mpo.gc.ca</a> > Website: <a href="http://www.meds-sdmm.dfo-mpo.gc.ca/">http://www.meds-sdmm.dfo-mpo.gc.ca/</a>

**Emergency Response Plan**

It is important to note that all fuel spills must be reported. All spill reports should be made to the 24-hour a day Canadian Coast Guard Operations Centre (Department of Fisheries and Oceans), toll free at 1-800-565-1633. The Operations Centre will then inform the appropriate government agencies to coordinate the response.

Appropriate contingency planning measures must be in place and staff aware of those measures to be undertaken in the event of an emergency situation. In developing a contingency plan, it is recommended that the Canadian Standards Association publication, *Emergency Planning for Industry*, CAN/CSA-Z731-95, be consulted as a useful reference. As part of such a plan:

- Appropriate spill response equipment (boom, absorbent pads, and barrels) should be maintained in a readily accessible location.
- All spills and releases should be promptly contained, cleaned up and reported to the 24-hour emergency reporting system (1-800-565-1633).

### **Cumulative Environmental Effects**

The amended CEAA explicitly recognizes the value of regional studies in improving the systematic consideration of cumulative effects. Amendments further recognize that federal authorities may participate in such regional studies, the results of which could be used in conducting environmental assessments where provinces and territories are in agreement with such an approach (CEAA, October 2003).

EC supports the preparation of a strategy between regulatory agencies in cooperation with proponents, the aquaculture industry and other interested stakeholders that will deal with cumulative effects. One of the objectives should be to establish optimal production levels that will not diminish the environmental quality and habitat requirements of natural populations in these ecosystems. A regional strategy should also enable a cooperative and constructive approach to understanding and managing cumulative impacts on the identified VECs. This analysis should also incorporate Traditional Knowledge from current users of this region (e.g. lobster fishers and traditional hunters and gatherers).

### **References**

- Burrige, L.E. 2003. A Review of Current Practices and Possible Environmental Effects. A Scientific Review of the Potential Environmental Effects of Aquaculture in Aquatic Ecosystems, volume 1, 97-125. Canadian Technical Report of Fisheries and Aquatic Sciences 2450, Fisheries and Oceans Canada.
- Cantox Environmental Inc. 2001. Scoring and Ranking of Chemicals used in Regional Aquaculture operations in Atlantic Canada Based on Ecological Risk Potential. Environment Canada, Pollution Prevention Division, Environmental Protection Branch, Atlantic Region.
- Ernst W., Jackman P., Doe K., Page F., Julien G., Mackay K., and T. Sutherland. 2001. Dispersion and Toxicity to Non-target Aquatic Organisms of Pesticides Used to Treat Sea Lice on Salmon in Net Pen Enclosures. *Marine Pollution Bulletin* Vol 42, No. 6, pp. 433-444.
- Gregory, R. and A. Locke. 2004. Status and Conservation of Eelgrass (*Zostera marina*) in Eastern Canada. Canadian Wildlife Service, Environmental Conservation Branch, Environment Canada, Atlantic Region.
- Muise B. and Associates. June 2000. Chemical Use by the Eastern Canadian Aquaculture Industry. Environment Canada, Pollution Prevention Division, Environmental Management and Technology Section, Atlantic Region.