



# Applicant Guidance Document - Environmental Information Reviews

Prepared by Aquaculture Development Division  
Fisheries and Land Resources  
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Newfoundland  
Labrador



# **APPLICANT GUIDANCE DOCUMENT – ENVIRONMENTAL INFORMATION REVIEWS**

LAST REVISED August 30, 2019

**Prepared by**

**Aquaculture Development Division**



**Department of Fisheries and Land Resources**

## 1. INTRODUCTION

New applications for aquaculture sites will undergo a preliminary environmental review by the Department of Fisheries and Land Resources (FLR) – Aquaculture Branch as a component of the licence assessment process.

The review ensures applicants provide sufficient information at the beginning of the application process prior to referral. This ensures each regulatory department and agency will have the necessary information it requires to complete a full assessment.

There is a requirement for comprehensive environmental management planning in our approach to developing the aquaculture industry. FLR is committed to sustainable development and providing an efficient “one-stop shop” application process, which this guide helps deliver. Complete information gathered early will reduce the need for multiple agencies to request additional information later in the review process.

The following will provide aquaculture applicants detailed guidance focusing on current areas of priority that require comprehensive information (i.e., Section D and F of the application). As a living document, users should note the guide’s content can change with priorities and updates in protocol(s). This is the fifth update of the Applicant Guidance Document – Environmental Information Reviews, first prepared in 2008 and updated in 2010, 2012, 2015, and most recently in 2019. Since 2015 there have been several notable changes to the regulatory and policy framework at the federal and provincial levels that will require aquaculture operators to update environmental management plans. These changes are as follows:

- Implementation of a regional Bay Management Area (BMA) agreement for finfish cage operations at the provincial level.
- Enactment of the Aquaculture Activities Regulations (AAR) under the federal Fisheries Act in 2015.
- Better knowledge of regional wild and farmed fish interactions.
- Adoption of more advanced technology and practices that can improve containment and support larger systems.
- Availability of more effective genetic methods to improve stock identification and traceability.

These actions have resulted in broader public interest in aquaculture, proposals for larger farm systems, and changes to the length of fallow periods, as well as changes to protocols for environmental site assessment, monitoring and reporting. The BMA agreement prescribes a minimum fallow period that is determined and coordinated regionally, and on a per-site basis. The AAR now determines whether a fallow period is extended for environmental reasons on a per-site basis, and this is assessed through a benthic monitoring program that measures an operation’s performance against specified chemical or biological indicators of biochemical oxygen demand (BOD).

## **2. KEY ENVIRONMENTAL INFORMATION**

### **GENERAL CONSIDERATIONS**

#### **Dated Information**

Aquaculture operations have been licensed and have operated in Newfoundland and Labrador under older regulatory and policy frameworks. Companies seeking to expand their enterprise to new sites, increase the size of existing sites, or seeking to move forward on an older application that was not advanced, are responsible for ensuring that environmental management plans are maintained and updated to meet the current regulatory and policy frameworks. The applicant should not assume information gathered on a previous application is still valid and acceptable. 2015 is an important year in this regard. The enactment of the federal AAR has resulted in changes to baseline site assessment, benthic monitoring, and annual reporting requirements.

FLR will consider whether an applicant demonstrates:

- It can manage the site and will apply up-to-date practices.
- Familiarity in the activities and risks in the vicinity of the proposed undertaking, aquaculture or otherwise, where time lapsed between a previous application and the current application.

An applicant should assume only up-to-date information is acceptable.

#### **Competency**

General statements referencing the applicant's level of experience will not substitute/address specific information requirements. When completing an application, applicants should focus on describing the original site data it has collected, as well as the management, operational, and technical aspects of its business in the context of its regulatory responsibilities.

#### **Sustainable Development Requires an Integrative Approach to Environmental Management**

Although particular sections of the document (i.e., Section D and F) focus on the environment, the entire application is reviewed in the context of environmental management.

## SECTION C: SITE INFORMATION

### Supporting Documentation

Separate maps showing exact location of site and details of the layout should be included.

Respecting the site location, the corner coordinates of the site should be included on supporting maps. Coordinates should be expressed as degrees and decimal minutes.

The cage configuration is also important (finfish). Respecting the details of the layout, the cage number and layout should be provided, as well as the cross-section in proportion to water depth. This is important because Fisheries and Oceans Canada (DFO) will request that the coordinates of each cage are recorded for AAR benthic monitoring purposes.

### **Item 8: Describe any routine facility maintenance procedures, including frequency.**

This should include onsite net cleaning and changes (finfish).

Suggested format:

Activity	Purpose	Frequency
e.g., remote operated net cleaning system	remove biofouling and maintain effective water exchange	spring, summer and fall biweekly; winter monthly

### **Item 10: Describe any fishing activities (e.g., commercial, Indigenous or recreational fisheries), tourism operations, cabins, recreational activities (e.g., boating, diving, water skiing, swimming, etc) that are located within a two-kilometre radius of the site lease boundary. Provide information on their time(s) of operation and proximity to the site.**

While DFO has in-house knowledge of fishing activities, local knowledge is helpful in providing context to the scale of activity and anticipating potential resource user issues prior to referral.

Suggested format:

Activity	Season	Proximity
e.g., lobster harvest	spring and early summer	0-2km

**Item 11: Has an aquaculture assessment been carried out on the site? (Yes or No) If yes, give details.**

In recent years, aquaculture applications have been supported by more comprehensive assessments completed for present and past developments. Traditionally applicants have emphasized benthic assessment work, but examples of other aquaculture assessments are introductions and transfers risk assessment, assessment of a site’s water and climate suitability, and environmental assessment registration of an undertaking. The following format is suggested to clearly note supporting assessments:

Assessment	Date	Company
e.g., AAR baseline site characterization report	August 2018	Newco Consulting

**SECTION D: ENVIRONMENTAL CONCERNS**

**Item 1: Identify any known activities or pollution sources in the area that may pose a threat to the site. Describe the activities and explain how it/they could impact the site.**

Key information requirements are:

- Number of cabins within the area
- Sewer outfalls/septic tanks emptying within the area
- Ocean disposal sites within the area
- Potential for vandalism in the area
- Amount of boating (recreational/inshore fishery/etc.) occurring within the area
- Industrial effluents
- Neighbouring aquaculture sites

Suggested format:

Activity	Proximity	Potential Impact
e.g., cabin	2 km	negligible

**Item 2: Describe all waste materials expected to be generated by the operation of this facility that shall be released into the water (i.e., faecal matter, food particles, etc.) or will require disposal on land.**

The key objective is to identify and qualify/quantify (where possible) all possible waste streams. It is assumed operations will generate all of the material (waste) streams listed below. The applicant should describe each of these. If they are not generated, explain the practice(s) that eliminates its generation. Descriptions of the management and/or mitigation of these waste streams are required in Item 5, and the applicant should assume each item will require management measures.

The following is a list of typical materials used or generated by aquaculture and the associated activity that can result in waste:

Organics	Finfish	Shellfish
Biofouling	Net maintenance	Harvest
Faeces	Grow-out	Not significant
Feed	Feeding	N/A
Fish discard/ mortality and drop-off	Processing/ Rearing	Processing/Rearing
Septic	Operations	Environmental/Operations
Wastewater	Processing bloodwater	Biofoul, undersized, and shell
Expired wooden pallets	Supplies and equip. handling	Supply and equipment handling

<b>Inorganic</b>	<b>Finfish</b>	<b>Shellfish</b>
Feed bags (i.e., LDPE and PP)*	Feeding	N/A
Expired HDPE* buoys	Navigation/Suspension	Navigation/Suspension
Expired HDPE* piping	Stock containment	N/A
Expired netting , and socking	Stock containment	Culture substrate
Expired nylon and PP* ropes	Mooring and containment	Mooring and longlines
Refuse	Containers, packaging, Misc.	Containers, packaging, Misc.

\* High density polyethylene (HDPE); Low density polyethylene (LDPE); Polypropylene (PP)

<b>Chemicals</b>	<b>Finfish</b>	<b>Shellfish</b>
Antifoulant	Net maintenance	N/A
Cleaner and disinfectant	Maintenance and biosecurity	Maintenance and biosecurity
Hydrocarbons	Fueling and maintenance	Fueling and maintenance
Paint	Maintenance	Maintenance

Suggested format:

Waste	Frequency*	Duration*	Approximate amount (MT annually)**

\*Frequency/duration can be approximated as: daily/<day; weekly/<week; monthly/<month; annually/<year; decade/>year.

\*\*If there is no method to approximate (e.g., biofouling) note as not determined (n.d.), or if it is reasonable to be approximated <1MT/a note as negligible.



**Item 3: Identify any changes to the project that may be caused by the environment. Aspects of the environment, such as weather and climate, tides, algal blooms, superchill, etc. should be considered. Identify measures to mitigate these changes**

Key information requirements include:

- Sites selected to avoid adverse climatic conditions
- Gear relocation/removal/addition for different seasons
- Removing gear prior to forecasted storm events
- Biosecurity plans
- Aquatic invasive species prevention, management, and reporting

Suggested format:

Event	Frequency*	Duration*	Impact(s)	Mitigation(s)

\*Frequency/duration can be approximated as: daily/<day; weekly/<week; monthly/<month; annually/<year; decade/>year.

**Item 4: Identify potential risk due to malfunctions or accidents that may occur during installation, operation, and decommissioning phases of the project (e.g. fuel spills, storm destruction, etc.). Discuss operational plans to prevent such accidents and malfunctions and present contingency plans to deal with each of these potential situations.**

Key information requirements include:

- Retrieval methods for lost lines/cages/gear
- Plans/methods to limit escapees
- Emergency Response Plan
- Refueling procedures (when, where, and how)
- Spill Response Equipment present at refuelling station (if yes, what equipment present)
- Communications

Suggested format:

Incident	Potential Impact	Response

**It is assumed that some fuel will be handled on the water;** therefore, the applicant should address whether a spill kit with absorbents, absorbent pads, and/or boom will be maintained on vessels. Also, if there is potential to spill hydraulic fluid, the same rationale applies.

**Debris and refuse may be lost due to weather events,** and without a contingency plan to retrieve this material, refuse may become abandoned along shorelines. Applicants should provide a plan to address shoreline cleanup and debris retrieval. Also, describe measures that prevent refuse and waste containers from tipping or blowing offsite.

Any applicable comprehensive plan prepared by the applicant can be noted by reference.

**Item 5: List planned measures to mitigate any harmful effects of the construction and operational phases of the project. Measures include, but are not limited to, ensuring that the construction site remains clean after work is completed and a biosecurity plan is in place.**

This item is one of the most extensive in the application; the applicant should expand upon the waste streams identified in Item (2), consider the potential effects of the project on the environment during construction and operation and vice versa; and describe the environmental management and/or mitigation practices that will be applied.

Any applicable information in an applicant's comprehensive environmental management plan and waste management plan can be noted by reference.

## Potential Environmental Impacts

### Examples of potential environmental effects of the project include:

- Increased oxygen demand
- Organic waste deposition and accumulation (feed and faeces/pseudofaeces)
- Disruptions to nitrogen cycling
- Increased algal growth
- Changes in benthic community structure
- Smothering of benthic habitat/creation of anoxic or anaerobic benthic conditions
- Etc.

**Site-specific information is crucial;** e.g., sites with large tidal fluctuations may replenish oxygen and remove organic waste regularly, thereby reducing such potential impacts.

The following items may be used to assess the site environment and how it may positively or negatively impact the aquaculture operation. Some of the following are also identified in the baseline data requirements identified in Section F.

- Filter capacities of shellfish
- Feed types and amount used for finfish
- Water depths at site
- Tidal fluctuations (i.e., differences between high and low tides)
- Substrate at site (e.g., sand, cobble, boulder, bedrock, etc.)
- Fetch
- Predominant current direction (if known)
- Aquatic flora and fauna species and locations
- Presence/absence of 'species at risk'
- Abundance of wild Atlantic salmon in the region.

## Species at Risk

**Species at Risk Act (SARA)** prohibits: the killing, harming or harassing of a threatened, endangered or extirpated species; the damage or destruction of an individual species' residence; and the destruction of any part of a species' critical habitat. The applicant must identify species at risk (SAR) that may be present and outline appropriate management measures. To do this, the applicant must review the SAR Public Registry for the most current information.

1. An aquaculture industry factsheet for SAR can be found at <http://www.dfo-mpo.gc.ca/species-especes/index-eng.htm>.
2. The following link is a list of SAR, at the time of writing, which may be seen in Newfoundland and Labrador (NL) and possibly observed around aquaculture sites.

Schedule 1 of the Species at Risk Act is updated periodically, and the applicant must access the public registry (<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>) and be familiar with the up-to-date list.

3. State the management measures in place, to respond to sightings and/or potential farm interaction with species of concern. Measures can include any one or more of the following:
  - Preventative measures
  - Observation and recording
  - Reporting
  - Handling and freeing of entangled or penned animals

Where recovery strategies and action plans are available, they can be used to gather information on the species in question. Recovery strategies and action plans can be found at [www.sararegistry.gc.ca/default\\_e.cfm](http://www.sararegistry.gc.ca/default_e.cfm).

The applicant is also encouraged to be familiar with species being considered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) because they may be listed under SARA during the life of the site operation.

### **Farmed and Wild Salmon Interaction (Finfish)**

Ongoing river studies have demonstrated that farmed and wild salmon interaction has occurred on the south coast in Atlantic salmon aquaculture production regions as a result of escaped farmed salmon interbreeding with wild populations. The following information is requested to demonstrate how the applicant will mitigate and support better knowledge of the risks:

- An overview of current knowledge on Atlantic salmon populations, rivers, presence, abundance and behaviour in the region of the proposed aquaculture site.
- Reference to the applicant's mitigation measures to minimize the risk of farm/wild interactions (i.e., where applicable mitigations are provided in another section of the application, the applicant can cross-reference to avoid redundancy).

Where applicable applicants should consider inclusion of the following initiatives:

- Note any partnerships with other organizations that are investigating better practices, containment, or understanding of farmed/wild interaction via study and monitoring.
- Proposed measures to enable identification and traceability of farm stock in the event of an escape.



## Waste Management

Describe the waste management plan that addresses the waste streams in Item (2). The following information is provided for context and to assist the applicant in framing its waste management plan for organics, inorganics, chemicals, and BOD.

Benchmarks are offered as approximations and are based on waste generated for every 1,000 MT of farm-gate aquaculture production. Context is also provided as to how the material is managed applying the 5Rs of waste management: reduce, reuse, recycle, recovery, and residual disposal.

<b>Organics</b>	<b>Approximate Annual Generation</b>	<b>Current Management Practice</b>
<b>Biofouling</b>	50 MT	Reduce (i.e., in-situ practices) Residual (i.e., disposal)
<b>BOD</b>	370 MT	Reduce (i.e., feed management practices) Residual (i.e., Fisheries Act)
<b>Finfish and its by-product*</b>	200 MT (processing) 120 MT (mortality)	Reduce (i.e., processing and husbandry) Recovery (i.e., rendering and agriculture) Residual (i.e., landfill)
<b>Shellfish and its by-product</b>	300 MT	Reduce (i.e., inventory reconciliation, product diversification) Recovery (i.e., agriculture) Residual (i.e., landfill)
<b>Septic</b>	Not quantified	Recovery (i.e., operations) Residual (i.e., CSSP)
<b>Wastewater</b>	Not quantified	Reduce (i.e., equip. upgrades) Residual (i.e., treatment)
<b>Expired pallets</b>	Not quantified	Reuse Residual (i.e., firewood)

\* The following is a summary of the current waste management options available for fish and fish byproduct for the purpose of emergency preparedness in the event of a depopulation, mass mortality, or accidental spill: salmon processing plants; fish rendering plants; ensiling; or a waste management facility approved for organic disposal. All options that involve High Risk Material (HRM) must have prior approval from all regulators, including the FLR – AAHD.

<b>Inorganics</b>	<b>Annual Generation*</b>	<b>Current Management Strategy</b>
Feed bags (i.e., LDPE and PP)	3-4 MT	Reduce (i.e., production scaling) Residual (i.e., landfill)
Expired HDPE buoys Expired HDPE piping	See next row	Residual (i.e., landfill)
Expired netting Expired nylon and PP ropes Refuse	6-7 MT	Reduce (i.e., larger cages) Reuse (i.e., net mending) Residual (i.e., landfill)

<b>Chemicals</b>	<b>Annual Generation</b>	<b>Current Management Strategy</b>
Antifoulant	Not quantified	Reduce (i.e., in-situ practices) Recovery (i.e., technology) Residual (i.e., disposal)
Cleaner and disinfectant	Not quantified	Reduce, reuse (i.e., logistics) Residual (i.e., neutralization)
Hydrocarbons	Not quantified	Reduce, reuse, recovery, residual
Paint	Not quantified	Residual (i.e., disposal)

### **Biochemical Oxygen Demand (BOD) Matter**

With respect to finfish sites, when managing BOD matter (i.e., faeces, feed and biofouling), applicants should consider the potential outcomes of the benthic monitoring program administered by DFO under the federal Aquaculture Activities Regulations (AAR). If an operation’s regulatory monitoring demonstrates that a benthic BOD regulatory threshold is exceeded, the operation will not be able to begin new production until follow-up monitoring demonstrates benthic indicators of BOD are below the regulatory threshold. A site that performs poorly in this regard may see its fallow extended. If the fallow is extended, BMA stocking policy for that area may cause the operator to miss the BMA stocking window for the following production cycle.

Applicants should consider all elements of site management that impacts the operation’s contribution to BOD, and prepare a contingency plan outlining proposed actions in the event operations exceed BOD indicators.

The following are examples of best practices established in NL that mitigate the impact of BOD:

<b>Activity</b>	<b>Standard Practice/ Mitigation Measures</b>	<b>Benefits</b>
Site selection (i.e., local)	<ul style="list-style-type: none"> <li>• Locating cages in water depths greater 30 m</li> <li>• Baseline assessment that includes current measurements, carbon footprint modelling at 10m contour intervals, and the collection of visual and/or chemical data within the predicted 1g/m<sup>2</sup>/d carbon footprint</li> </ul>	Avoidance of productive fisheries habitat (e.g., eelgrass and lobster habitat) as well as promote dispersion
Site selection (i.e., regional)	<ul style="list-style-type: none"> <li>• Mandatory &gt; one kilometre site separation for sites owned by the same company.</li> <li>• Mandatory &gt; five kilometre site separation for sites owned by different companies.</li> <li>• One kilometre separation from scheduled salmon rivers</li> </ul>	Promote dispersion Fisheries protection
Fallowing	<ul style="list-style-type: none"> <li>• Fallow period following a production cycle</li> </ul>	Facilitates breakdown of organics deposited below cages
Stocking density	<ul style="list-style-type: none"> <li>• Maximum 18 kg/m<sup>3</sup> stocking density during growing season</li> </ul>	Caps production of feeding and faecal material over an area
Feeding	<ul style="list-style-type: none"> <li>• Avoiding use of wet feed</li> <li>• Feed cameras monitor feed administration</li> </ul>	Control of feeding, and avoid over feeding
Net cleaning	<ul style="list-style-type: none"> <li>• Heavily fouled nets are removed from site to a centralized net washing facility</li> </ul>	Decrease biofoul disposed at the aquaculture site

The following are examples of actions that can be considered in a proposed mitigation plan to decrease an operation's organic deposits:

<b>Activity</b>	<b>Action</b>	<b>Benefit</b>
Site selection (i.e., Local)	<ul style="list-style-type: none"> <li>• Conduct further current and loading analysis to adjust site origination and/or location</li> </ul>	Promote dispersion
Fallowing	<ul style="list-style-type: none"> <li>• Maintain fallow until monitoring demonstrates that the site meets regulatory standards for operation</li> </ul>	Facilitates breakdown of organics deposited below cages

	<ul style="list-style-type: none"> <li>Identify an alternate site in a contingency plan to avoid loss of production</li> </ul>	
Stock density	<ul style="list-style-type: none"> <li>Prescribe a reduction in stock density for the next production cycle.</li> <li>Identify an alternate site in a contingency plan to divert excess stock.</li> </ul>	Direct reduction in feed requirements and the production of faeces
Feeding	<ul style="list-style-type: none"> <li>Conduct a third-party audit of feeding protocols</li> <li>Check level of feeding in comparison to biomass and water temperatures</li> <li>Monitoring - direct staff monitoring in combination with submerged cameras</li> <li>Daily records for feed type and amount (i.e., numbers, biomass, temp, growth rates)</li> <li>Investigate and apply new technologies that capture and circulate feed</li> <li>Investigate and apply more efficient feed monitoring technologies</li> </ul>	<p>Improve efficiencies in feeding.</p> <p>Can be part of a maintenance schedule and monitored more regularly through internal audits</p>
Net cleaning	<ul style="list-style-type: none"> <li>Investigate and apply more efficient technologies for onsite maintenance net cleaning, or adjust frequency of cleaning</li> </ul>	Inhibit colonization and avoid the bulk release of biofouling

**Item 6 (Finfish): Describe proposed methods to minimize fish escapes from cages. Also describe procedures for recapture of escapes.**

Outline containment and escape management plan that meets or exceed the minimum requirements of the NL Code of Containment (CoC).

**Item 6 (Shellfish) and 7 (Finfish): Should decommissioning be required, describe the process, including measures to restore the area to its natural setting. Provide details on how all associated infrastructure will be removed from the site if the site is no longer required. Explain how this material will be disposed of.**



The potential risk of site abandonment due to environmental or financial factors requires applicants to submit a decommissioning/contingency plan that includes the following information:

- Capacity to execute
- Time of year when gear will be removed
- Types of gear to be removed
- Disposal of unwanted/damaged gear (i.e., how, where)
- List of gear to remain onsite (i.e. anchors, navigation aids, etc.)
- Identify what equipment is salvageable

## **SECTION F(c) BOTTOM SAMPLES (FINFISH)**

Applicants must submit baseline data as per the Aquaculture Activities Regulations (AAR). This baseline will be assessed by DFO. DFO requests the information within 30 days of submitting an application for an aquaculture licence, and requires the information 300 days prior to stocking.

**The AAR guidance document** can be found at this link, <http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/aar-raa-gd-eng.htm>

**The AAR aquaculture monitoring standard** can be found at this link, <http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/aar-raa-ann7-eng.htm>

**Questions or comments can be directed to:**

Regional Aquaculture Development Officer  
Grand Falls-Windsor (709) 292-4100  
St. Alban's (709) 538-3705  
Corner Brook (709) 637-2960

Or

Jonathan Kawaja  
Environmental Scientist (Aquaculture)  
Aquaculture Development Division  
Tel: (709) 292-4100  
Email: jonathankawaja@gov.nl.ca

