Amended Environmental Impact Statement
Proposed Redevelopment of Snow Island's Atlantic Sea Smolt Ltd. Facility
1300 Route No. 2 (Parcel Nos. 849505 and 1022300)
Rollo Bay West, Kings County, PEI

JOOSE ENVIRONMENTAL PROJECT NO. JE0219

Report prepared for:

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Executive Summary

Joose Environmental Consulting Inc. (Joose Environmental) and DE Jardine Consulting (DE Jardine) were contracted by AquaBounty Canada Inc. (AquaBounty) and its Subsidiaries to complete an Amended Environmental Impact Statement (EIS) for the proposed redevelopment of Snow Island's Atlantic Sea Smolt Ltd. (ASSL) Facility located at 1300 Route No. 2 (Parcel No. 849505 and 1022300) in Rollo Bay West, Kings County, PEI.

As part of the Amended EIS, AquaBounty is proposing to construct one new structure. This building will be a 3,700 m^2 (40,000 ft^2) recirculated aquaculture (RAS) Commercial Production facility on the property in Rollo Bay West that was acquired in the summer of 2016. In addition to this structure, a 3,700 m^2 (40,000 ft^2) RAS facility will replace the original flow through broodstock facility. The two 3,700 m^2 (40,000 ft^2) structures are an addition to the original EIS that included the renovation of the existing structure (Hatchery) and the construction of a 1,530 m^2 (16,500 ft^2) structure (Broodstock).

The subject property has operated as a licensed aquaculture facility since 1978. AquaBounty would rear AquAdvantage Salmon, a sterile genetically modified salmon, from eyed egg to market size within the facility. The proposed site will operate using recirculated groundwater. Effluent from the facility will be screened using multiple mechanical barriers, various pieces of dewatering and sludge concentrating equipment, sludge would be stored on site to be repurposed later. Clear water would be introduced in a pond or constructed wetland and will be discharged into the adjacent stream which runs through the subject site.

The subject site is located at civic address 1300 Route No. 2 in Rollo Bay West, Kings County, PEI and is identified as Parcel Nos. 849505 and 1022300 (refer to Figure No. 1 and Drawing No. 1, **Appendix A**). As previously indicated the site has been a licensed aquaculture facility since 1978 with extensive commercial development of the property.

The Amended EIA for the proposed project was completed as per Section 9 of the PEI *Environmental Protection Act*. The Amended EIA evaluated the potential environmental effects of the proposed project taking into consideration all activities required for the construction, operation and maintenance of the facility.

As part of the Amended EIS the following mitigation and environmental monitoring elements will be adhered to during the construction and operation of the proposed facility, including:

Mitigation

- During construction and operation (including accidents, potential malfunctions and unplanned events) all provincial and federal codes, standards and best management practices will be followed; and

- During operation mitigation for hazardous waste and non-hazardous waste will be conducted as outlined in Tables 3.3, 3.4 and 3.5 in Sections 3.2.8 and 3.2.9 of this report.

Environmental Monitoring

- During the construction period the construction manager will conduct regular environmental monitoring site inspections to ensure all construction components adhere to all provincial and federal regulations and codes; and

- Monitoring of the effluent being discharged into the adjacent stream including samples being collected and analyzed for parameters required by the owners of the utility and the PEI Department of Communities, Land and Environment (PEIDCLE) once a year.

Based on the information obtained during the completion of the Amended EIA, Joose Environmental and DE Jardine Consulting has concluded that the potential environmental effects of the proposed project on all valued environmental components (VECs - listed in Section 6 of this report) would not be significant during the construction, operation and maintenance of the proposed facility with the planned mitigation and monitoring elements in place. Consequently, it is recommended that the proposed project should proceed as described and outlined in this report.

The statements made in this Executive Summary text are subject to the limitations included in Section 8.0, and are to be read in conjunction with the remainder of this report.

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1.0 INTRODUCTION

Joose Environmental Consulting Inc. (Joose Environmental) and DE Jardine Consulting (DE Jardine) were contracted by the AquaBounty Canada Inc. (AquaBounty) and its Subsidiaries to complete an Amended Environmental Impact Statement (EIS) for a proposed redevelopment of Snow Island's Atlantic Sea Smolt Ltd. (ASSL) Facility located at 1300 Route No. 2 (Parcel Nos. 849505 and 1022300) in Rollo Bay West, Kings County, PEI.

As part of the Amended EIS, AquaBounty is proposing to construct two 3,700 square metres (m^2) or 40,000 square foot (ft^2) recirculated aquaculture (RAS) facilities. These facilities will be for commercial production and egg production on the property in Rollo Bay West that was acquired in the summer of 2016. The 3,700 m^2 (40,000 ft^2) structures are an addition to the original EIS that included the renovation of the existing structure (Hatchery) and the construction of a 1,530 m^2 (16,500 ft^2) structure (Broodstock); the latter which will be replaced with the larger (3,700 m^2 (40,000 ft^2)) RAS broodstock facility.

1.1 Project Name, Proponent Information and Authors of EIS

Information regarding the project name, proponent and authors of the Amended EIS is provided in Table 1-1.

Table 1-1. Project Information

Project Name	Proposed Redevelopment of Snow Island's Atlantic Sea Smolt Ltd. Aquaculture Facility
Proponent Information	AquaBounty Canada Inc. Contact: Ms. Dawn Runighan - Facility Manager
Authors of EIS	DE Jardine Consulting: Mr. Don Jardine, B.Sc. Joose Environmental: Mr. Peter Joostema, P.Eng., CESA, FEC

1.2 Project Information

1.2.1 Project Overview

AquaBounty is proposing redevelop ASSL Aquaculture Facility located at 1300 Route No. 2 in Rollo Bay West, Kings County, PEI, which was acquired in the summer of 2016. The proposed redevelopment is to renovate the existing structure and construct two new structures (3,700 m^2 (40,000 ft^2) each) to be used as a recirculated aquaculture (RAS) Commercial Production Facility on the property in Rollo Bay West. AquaBounty will rear AquAdvantage Salmon, a sterile genetically modified salmon, from eyed egg to market size within the production facility. As described in the original EIS the Broodstock facility will house all female conventional Atlantic salmon for egg production purposes.

1.2.2 Current Site Description, Historical and Adjacent Land Use

The subject site is located at civic address 1300 Route No. 2 in Rollo Bay West, Kings County, PEI and is identified as Parcel Nos. 849505 and 1022300 (refer to Figure No. 1 and Drawing No. 1 **Appendix A**). The subject property encompasses an area of 16.53 hectares (40.84 acres). The site is currently not operational but has been used as an aquaculture facility (including broodstock facility originally) for the past 37 years. The main broodstock holding unit and incubation facility was previously operated under the business name OvaTech and had maintained Canadian Fish Health Certification for over 20 years until it was purchased back by Atlantic Sea Smolt in 2012 (original owner). The site has not been in operation since October 2013.

Adjacent and surrounding land use to the proposed project site is summarized in Table 1-2.

Table 1-2. Adjoining Properties - Current Land Use

Direction	Current Land Use	Current Occupant
North	Undeveloped land used for Agricultural Purposes	Agricultural
East	Undeveloped forested land	Woodland
South	Undeveloped land used for agricultural purposes followed by residential farm stead	Agricultural/Residential
West	Combination of Undeveloped land used for agricultural purposes and forested areas	Agricultural/Woodland

1.3 Regulatory Framework

The EIS for the proposed project has been conducted based on the regulatory framework outlined in Section 9 of the PEI *Environmental Protection Act (EPA)*.

Section 9 of the PEI *EPA* sets out the requirements of the environmental assessment process that the proponent of an undertaking must complete before a project can proceed. The term "undertaking" as outlined in the PEI *EPA* includes any construction, industry, operation or other project which will or may:

i. cause the emission or discharge of any contaminant into the environment;

ii. have an effect on any unique, rare or endangered feature or the environment;

iii. have a significant effect on the environment or necessitate further development which is likely to have a significant effect on the environment; or

iv. cause public concern because of its real or perceived effect or potential effect on the environment.

As stated in the subsections of Section 9 in the PEI *EPA*, the process must adhere to the following:

(1) No person shall initiate any undertaking unless that person first files a written proposal with the Department and obtains from the Minister written approval to proceed with the proposed undertaking.

(2) The minister, in considering a proposal submitted pursuant to subsection (1), may

- *require the person submitting it to supply such additional information as the Minister may require;*
- *require that person to carry out an environmental impact assessment and submit an environmental impact statement; and*
- *notify the public of the proposal and provide opportunity for comment.*

(3) An environmental assessment and environmental impact statement shall/have such content as the Minister may direct.

(4) The approval required by this section is in addition to any other requirements imposed by the province or a municipality.

As part of the process, the environmental impact assessment (EIA) and corresponding EIS must be completed and submitted to the Technical Review Committee (comprised of provincial regulatory agencies and potentially federal regulatory agencies) for review of the proposed project. At the end of the EIA process, a determination on the proposed project approval would be made (i.e., not approved, approved or approved with conditions). Should the EIS be approved, the Minister of the PEI Department of Communities, Land and Environment (PEIDCLE) issues a written approval pursuant to Section 28 of the PEI *EPA*.

1.4 Regulations and Statutes for Assessing the Project

An outline of the environmental legislation, approvals and guidelines that may be applicable to the proposed project is provided in Table 1-3.

Table 1-3. Approvals Required - Proposed Acquisition and Redevelopment of Snow Island's Atlantic Sea Smolt Facility - Rollo Bay West

Required Approval	Legislative Authority	Authority	Status
Environmental Impact Assessment	Section 9 of the PEI *EPA*	PEIDCLE	Amended application dated April 12, 2017. Original application dated February 19, 2016
Development Permit	PEIDCLE Inspection Services Branch within the Department	PEIDCLE Inspection Services Branch within the Department	Permit to be obtained by AquaBounty
Groundwater Extractions Permit	PEIDCLE	PEIDCLE	Permit obtained by AquaBounty
Watercourse Alteration Permit	PEIDCLE (Section 6 of the PEI *EPA)*	PEIDCLE	Permit obtained by AquaBounty
Compartmentalization Permit	Canadian Food Inspection Agency (CFIA) - National Aquatic Animal Health Program	CFIA	Permit to be obtained by AquaBounty

2.0 PROJECT DESCRIPTION

The subject property which AquaBounty has acquired is an approximately 16.53 hectare (40.84 acres) parcel of land located in Rollo Bay West and has been a licensed aquaculture facility since 1978. The current property consists of a main hatchery building, three smaller rearing buildings and a tank field consisting of 4 fiberglass tanks each with a volume of 174 m^3. The facility's current water supply comes from six different sources: four main production wells (PWs), an artesian well, and a well for domestic use.

The proposed project would involve the renovation/re-development of the existing site in Rollo Bay to enable AquaBounty to expand and scale up to commercial production of their operation on PEI. This would include the renovation of the existing building and construction of two new structures (3,700 m^2 (40,000 ft^2) each) to be used as recirculated aquaculture (RAS) Commercial Production facility and Broodstock facility.

2.1 Project Background and Regulatory History

AquaBounty Canada Inc. is a wholly owned subsidiary of AquaBounty Technologies Inc.; a biotechnology company focused on enhancing productivity in the aquaculture market, with corporate offices located in Maynard, Massachusetts, USA.

AquaBounty began operations in Prince Edward Island (PEI) in 1996 and has maintained a well accredited aquaculture facility with high regards for the environment since that time. The facility is regulated and inspected routinely by Environment Canada, United States Food and Drug Administration (USFDA), Department of Fisheries and Oceans (DFO), and the Canadian Food Inspection Agency (CFIA). Both the molecular laboratory and fish rearing facilities are operated by well trained staff under Good Laboratory Practices and Good Manufacturing Practices; the facility is most likely one of the only aquaculture facilities in the world which operates under these well-structured guidelines.

AquaBounty Technologies, Inc., (ABT) was originally incorporated in 1991 under the name A/F Protein, Inc., to pursue the commercial development of applications for antifreeze proteins (AFPs). A/F Protein subsequently acquired license to the AquAdvantage® transgene, and was reorganized in 2000 into two entities: A/F Protein, which retained the rights to AFP technologies; and, AquaBounty Farms, Inc., which obtained the rights to AquAdvantage technology. In 2004, AquaBounty Farms changed its name to AquaBounty Technologies, Inc., and has continued to operate since that time from its corporate headquarters in Maynard, MA, and a wholly-owned aquaculture research and development (R&D) subsidiary, AquaBounty Canada, Inc., in Fortune, PEI.

AquaBounty Technologies has been developing their product, AquAdvantage® Salmon, since the 1990's. The product is a genetically modified salmon that exhibits rapid growth during early life, reducing the time it takes the animal to reach market size. This was achieved by micro-injection of a transgene containing the GH-1 gene from Chinook salmon and regulatory sequences of an AFP gene from ocean pout into the egg of a conventional Atlantic salmon. A product line was identified using genotypic and phenotypic testing and developed through generations of breeding with conventional domestic Atlantic salmon lines. AquAdvantage® Salmon are all-female, triploid (sterile) salmon that will be reared in land-based, fully contained facilities. The eggs are produced by fertilizing eggs from conventional female Atlantic salmon with milt (sperm) from AquAdvantage female broodstock that have undergone sex-reversal (neomales). The fertilized eggs are then subjected to hydrostatic pressure shock, inducing triploidy. The company has observed on average a 99.8% triploid production rate over the course of years of production; note that not all the 0.2% non-triploid eggs are viable. The sterile eggs will be raised in a land-based contained, recirculating aquaculture system for grow-out to market size.

Products such as AquAdvantage® Salmon are subject to regulatory approval processes designed to protect humans, animals, and the environment. The typical pre-approval development process for products such as this is 7-10 years; there has been over 25 years of research devoted to AquAdvantage® Salmon.

A complete regulatory history for AquaBounty, including links to the regulatory authorities which include the approval documentation, is included in **Appendix B**.

2.2 Alternatives to Project (Options Considered)

Alternatives to the project were considered including: 1) expansion of AquaBounty's current facility in Fortune and 2) review of potential locations for the proposed new facility. Expansion of the facilities at the Fortune location was not deemed a suitable alternative based on the following:

- Limited biosecurity enhancement (all broodstock on one site);
- Possible limitations with groundwater; and
- Electrical limitations (single phase).

A review of alternative locations for the proposed facility determined that different sites were not acceptable due to various factors including, but not limited to the following:

- surrounding land use and development;
- availability of groundwater resource;
- availability of existing aquaculture infrastructure (i.e., existing structure, holding tanks, etc.);
- proximity to AquaBounty's facility in Fortune; and
- historical use of the proposed site as an aquaculture facility (37 years); and
- significant cost to establish a new site with no history or infrastructure in place.

2.3 Project Schedule

The proposed new facilities will be completed in two phases over the next six months. The two phases of the proposed project are outlined below:

Phase 1 (May - June 2017): renovation and upgrade of existing infrastructure located on the subject site; and

Phase 2 (May 2017 - May 2018): construction of two new pre-engineered steel buildings to be as part of the recirculated aquaculture (RAS) Commercial Production facility.

An outline of the proposed project schedule is provided in Table 2.1.

Table 2.1 Rollo Bay West - Proposed Project Timeline

Task	Timeline
Existing Structure and Infrastructure	
Remove bank of 1.5 m (5 ft.) combi tanks and install 3.7 x 1.5 m (12 x 5 ft.) tanks in hatchery to accommodate larger fish.	May 2017
Install RAS system in existing hatchery including plumbing and electrical requirements	
Remove tanks from behind old hatchery buildings and remove any materials from water way. (Permitting necessary before completing work)	May - June 2017
Remove old silo building, tanks, and foundation (Permitting as required). General clean-up of the site and property.	
New Structure and Associated Infrastructure	
Begin construction of 55 X 67 m (180 X 220 ft. - 40,000 ft^2) facility	May 2017
Begin construction of 49 X 74 m (162 X 241 ft. - 40,000 ft^2) facility	July 2017
Construction of Bio filters and tank pads	July 2017
Piping and Tank installation	
Start Electrical Installation	August 2017
Facility Operating Test	December 2017
Start operation of Hatchery unit (eggs)	February 2018
Start operation of Grow-out units	May 2018

An overview of the proposed development is provided on Drawing No. 1, **Appendix A**.

3.0 PROJECT ACTIVITIES

A description of the project activities for the new facility has been broken down into four main components including:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

3.1 Planning Component

3.1.1 Property Acquisition

AquaBounty Canada Inc. has negotiated the Purchase and Sale Agreement, conducted a title search, and inventoried the fixtures and personal property. The transfer of the property has been completed.

3.1.2 Project Survey

A legal and topographical survey of the subject property was completed in November 2016. The topographical survey of the subject site will assist with the layout and design of the proposed facility.

3.2 Construction Component

During the construction component it is expected that the equipment to be used will include, but is not limited to excavators, bulldozers/earth movers, and tandem dump trucks. During the construction period the project manager will conduct regular environmental monitoring site inspections to ensure all construction components adhere to all provincial and federal regulations and codes.

3.2.1 Site Preparation

The site preparation for the new structure will involve grubbing limited areas of the site where unsuitable fill materials exist and replacement with structural fill within the footprint of the new buildings. The top soil and fill materials grubbed from the area to be developed will be maintained on the subject site and will be utilized by AquaBounty for landscaping purposes. Select borrow and other aggregate fill materials will be required to build up portions of the subject site during construction for access and around existing/new infrastructure.

3.2.2 Site Access

Site access will be from the Bear River Road which has been reviewed and approved by PEI Department of Transportation, Infrastructure and Energy (PEIDTIE) with the supporting documentation provided in **Appendix C**. No significant issues associated with the site access are expected. As the site is located approximately half a kilometer off an all-weather road which has a daily flow of trucks and other heavy equipment, no major impact on existing traffic flow is expected in the area due to daily operations on the site. The vehicle flow to the site would be an average of 5 to 10 per day. The main flow would be when staff is coming to and leaving work.

3.2.3 Site Structures

The initial phase of the development will include the renovation of the existing main site structure and removal of the old silo building, tanks, and foundation located on the eastern portion of the subject site. The second phase of the development, to be initiated in May/June 2017 is the preparation and construction of two pre-engineered steel buildings (approximately 3,700 m^2 (40,000 ft^2) each) on the northern portion of the subject site to be used as part of the recirculated aquaculture (RAS) Commercial Production facility (refer to Drawing No. 2 in **Appendix A**).

The current building (Building 1) at the subject property has dimension of 17 x 49 m (55 x 160 ft.) for a total floor space of 833 m^2 (8,800 ft^2). The renovation/redevelopment will make the bulk of the space dedicated to the fish hatchery, with a small portion going towards staff accommodations, offices, lunchroom, and work shop. This building will contain the following equipment:

- incubation equipment for rearing the eggs to propagate broodstock populations;
- thirty (30) fiberglass tanks having a capacity of 0.220 m^3;
- fifteen (15) fiberglass tanks having a capacity of 2.5 m^3 and
- twelve (12) fiberglass tanks having a capacity of 14.8 m^3.

The building will be used as a hatchery and early rearing area to support the broodstock breeding program. It will operate as a 99.7% RAS (Recirculating Aquaculture System), thus conserving water by using only small amounts as make-up water for the RAS system. The make-up water will come from one (1) of two (2) groundwater production wells (PWs) located on the property. Figure 1, shows the proposed layout of the structure; Figure 2 is a photo of the current main building. The remaining out buildings will not be used to house fish and removed from the property as indicated above.

Domestic heat to the facility is from a furnace oil fired boiler which heats up a water glycol mixture that is circulated within the concrete floor of the domestic area. Heating within the hatchery is a forced air system which utilizes heat generated from an oil fired furnace.

Oxygenation is a key water parameter for farming fish in land-based facilities. Passive aeration can obtain saturation levels of 100% but in more intensive farming practices oxygen must be introduced to make up for additional biomass and loading densities. The ASSL facility currently utilizes oxygen generation or concentrating equipment which typically produces 90% oxygen purity. AquaBounty will change over to a liquid oxygen system (LOX), which is stored on site in an 11m³ insulated tank. This tank is monitored by the supplier in real time and they automatically fill it as LOX levels deplete. LOX purity is typically over 99%.

Figure 1 Proposed Tank Layout (Building 1)

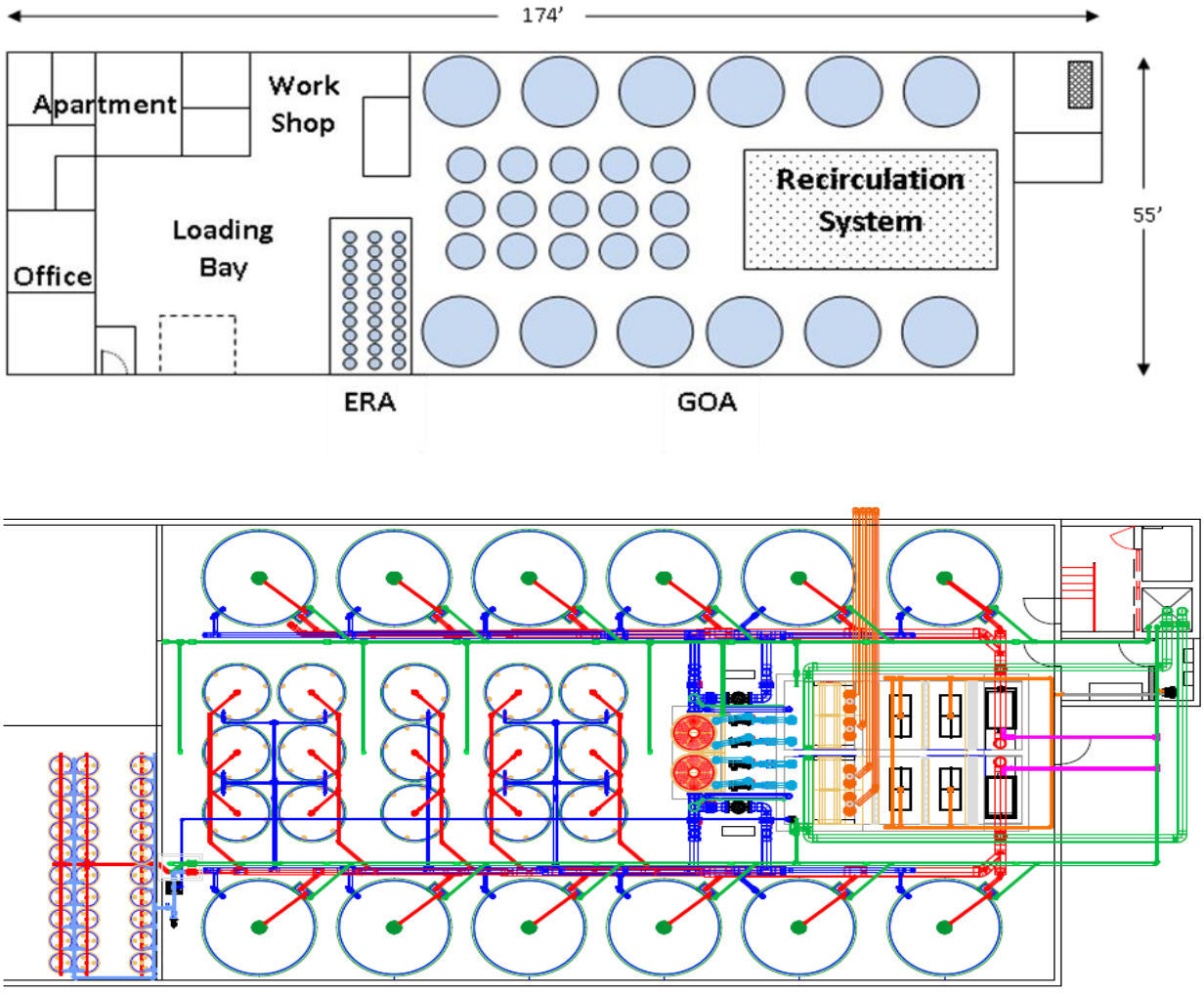


Figure 2: Current Main Structure (Building 1)

With expansion at the site, broodstock and egg production utilizing flow-through rearing conditions is no longer feasible. For future commercial production it will be necessary to generate large quantities of non-transgenic salmon eggs. The eggs will have to be available over the course of the year for stocking commercial production units. For these reasons, a larger broodstock facility operated on RAS has been designed, which has the ability to produce three spawning cycles per year. Construction of the revised 3,700 m^2 (40,000 ft^2) broodstock facility is scheduled to begin in June/July 2017. After site preparation work is completed, the concrete foundation of the new site structure will be poured. Upon completion of the concrete foundation it is estimated that the pre-engineered steel structure will be erected within 25 days. All components are pre-fabricated and will be shipped to the Rollo Bay West site directly from the building manufacturer. A staging area is available to receive all components of the building as they arrive prior to setup and a crane will be on site to offload all materials and lift them into position during the assembly process.

The broodstock building will be constructed on the northern portion of the site (Building 2). This pre-engineered steel building will have approximate dimensions of 50 x 74 m (162 x 241 ft.), with a footprint of ~ 3,700 m^2 (40,000 ft^2). Upon completion of the exterior components of the structure the interior construction will be initiated with the installation of bio-filters, tank pads, tanks and RAS equipment. It will consist of 99.7% RAS (Recirculating Aquaculture Systems) to produce multiple year classes of Atlantic salmon brood stock. It will use small amounts of make-up water from one of the two (2) groundwater PW's. Four (4) separate year classes of fish will be housed in the new building (refer to Figures 3, 4 and 5).

Figure 3: Broodstock Structure (Building 2) - South and North Elevations

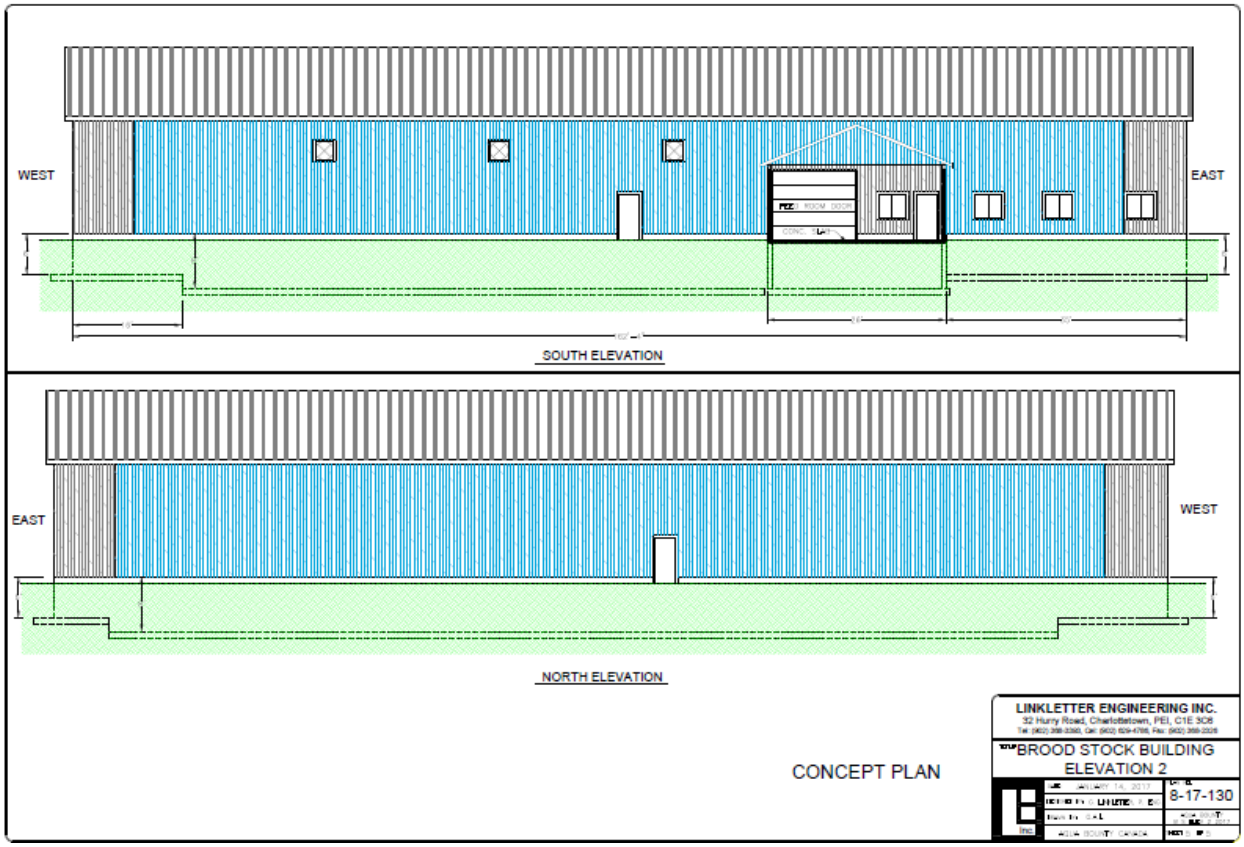


Figure 4: Broodstock Strcuture (Building 2) - West and East Elevations

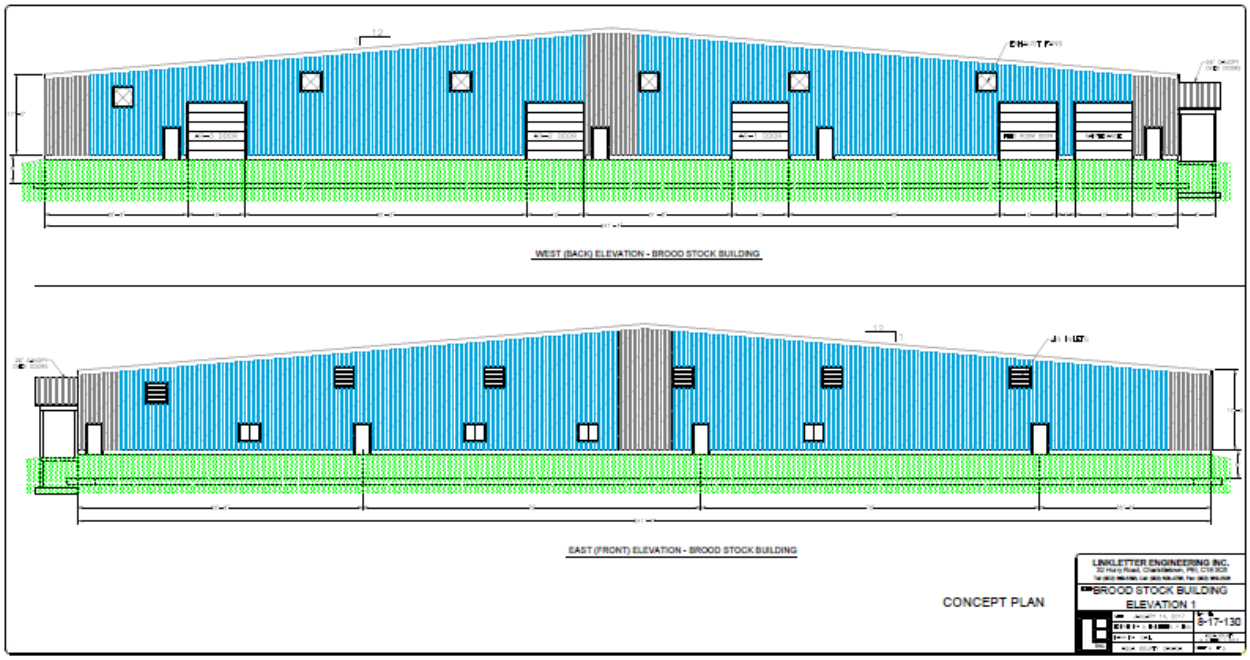
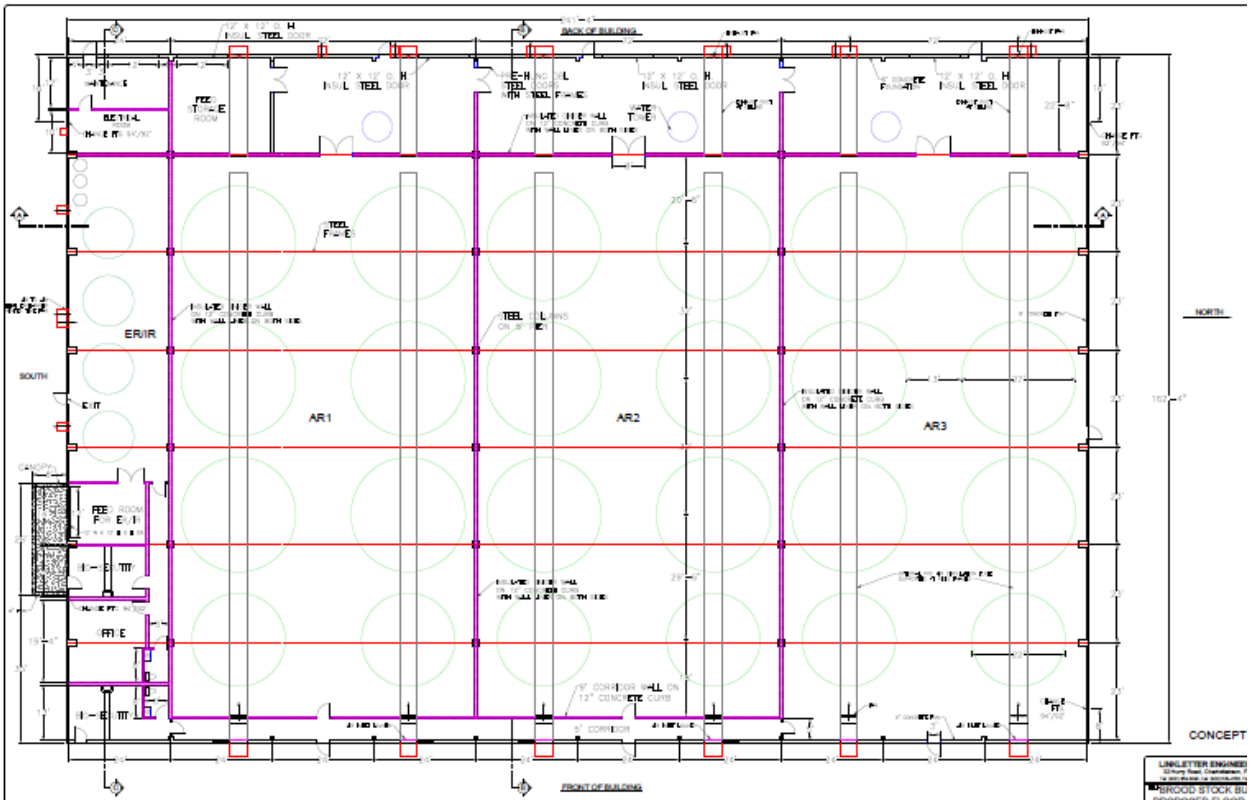


Figure 5: Broodstock Structure (Building 2) - Floor Plan



Building 2 will enclose the following rearing equipment:

- hatchery equipment to incubate eggs for the propagation of the conventional broodstock;
- Three (3) 0.58 m³ early rearing tanks; four (4) 12.8 m³ intermediate rearing tanks;
- Six (6) 44.4 m³ rearing tanks for 2 year olds;
- Nine (9) 92.6 m³ rearing tanks for 3 year olds; and
- Nine (9) 146.3 m³ rearing tanks for 4 year olds.

The new facilities will comply to bio-security requirements associated with AquaBounty's company Standard Operating Procedures (SOPs) and the CFIA Compartmentalization Program (refer to *National Standards for the Aquatic Animal Health Compartmentalization Program* and *Producer Guidance for the Creation of a Biosecurity Plan for Compartmentalization, April 2013*). AquaBounty's SOPs are reviewed and maintained on a regular basis to be kept in date with the

latest changes and updates to regulations and policies. Every effort must be made to protect the fish from vectors that may be carrying pathogens including:

- **Biological vector** defined as an organism, usually an arthropod, in whose body the pathogen develops or multiplies before becoming infective for the recipient individual.

- **Mechanical vector** defined as a living organism that can passively transmit the pathogen to an aquatic animal but is not infected by the pathogen (and therefore cannot actively shed the pathogen).

Table 3.1 List of CFIA Pathogens of Concern

Pathogen	Compartment Program
IHN	Y
VHS	Y
ISA	Y
IPN	Y
EHN	Y
OMV	Y
Myxobolus cerebralis (Whirling disease)	Y
Ceratomyxa Shasta	Y
Gyrodactylus salaris	Y

Construction of the pre-engineered steel building to be used as a Commercial Grow-out facility (Building 3) is scheduled to begin in May/June 2017 with the initiation of site preparation and construction of concrete footings. As indicated the new building is a pre-engineered steel structure that will have all components fabricated and shipped to the Rollo Bay West site to be assembled. A staging area will be developed to receive all components of the building as they arrive prior to setup and a crane will be on site to offload all materials and lift them into position during the assembly process. Upon completion of the exterior components of the structure, the interior construction will be initiated with the installation of bio filters, tank pads, tanks and RAS equipment. The building will have approximate plan dimensions of 55 x 67 m ~ 3,700 m^2 (180 x 220 ft. ~ 40,000 ft^2) as shown in Figure Nos. 6, 7 and 8. The 3,700 m^2 (40,000 ft^2) structure will be used as a hatchery and grow-out facility, holding multiple year classes of fish until they are ready for market at approx. 4.5 - 5 Kgs. The 3,700 m^3 (40,000 ft^2) Commercial Grow-out facility will also operate as a 99.7 % RAS as previously described for the Hatchery and Broodstock buildings

Building 3 will enclose the following rearing equipment:

- Three (3) 8.0 m³ early rearing tanks;
- Three (3) 51.3 m³ intermediate rearing tanks;
- Eight (8) 105 m³ Advanced Rearing 1 tanks;
- Six (6) 250 m³ Advanced Rearing 2 tanks; and
- Three (3) 71 m³ Purge tanks.

Figure 6: Commercial Grow-Out Structure (Building 3) - South and North Elevations

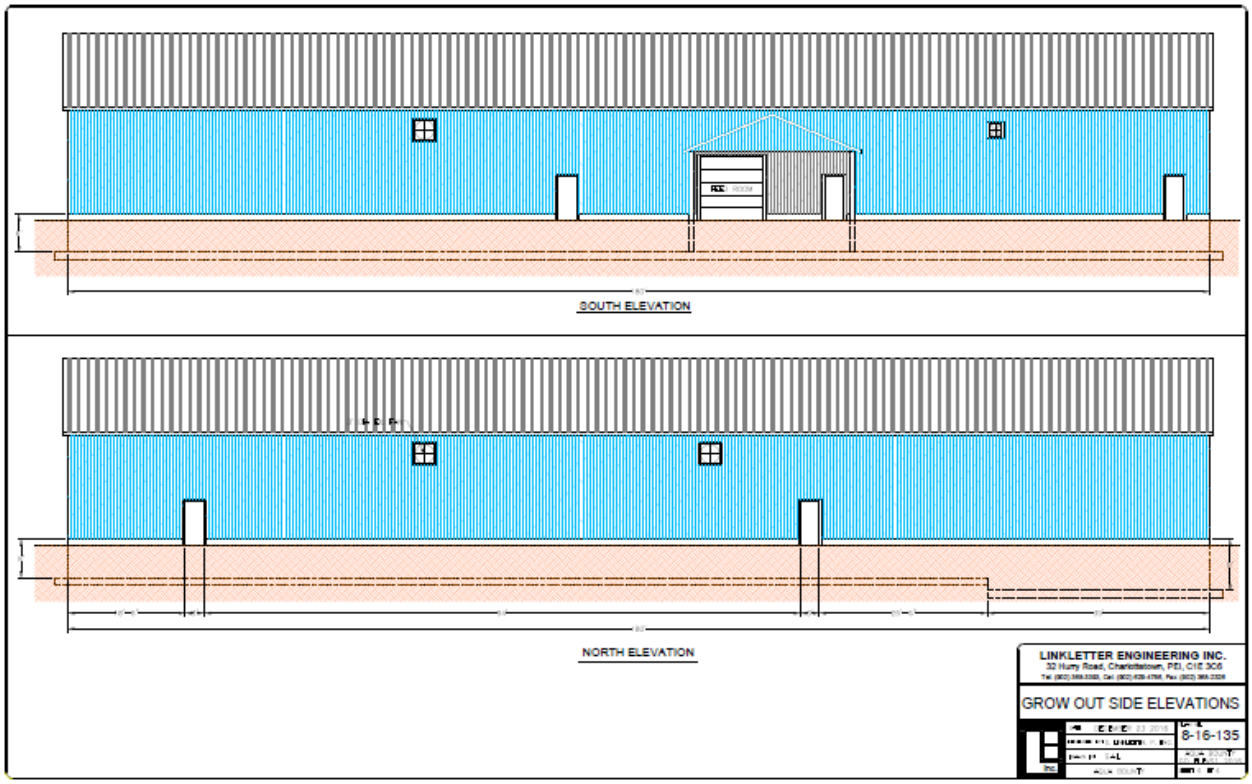


Figure 7 Commercial Grow-Out Structure (Building 3) - East and West Elevations

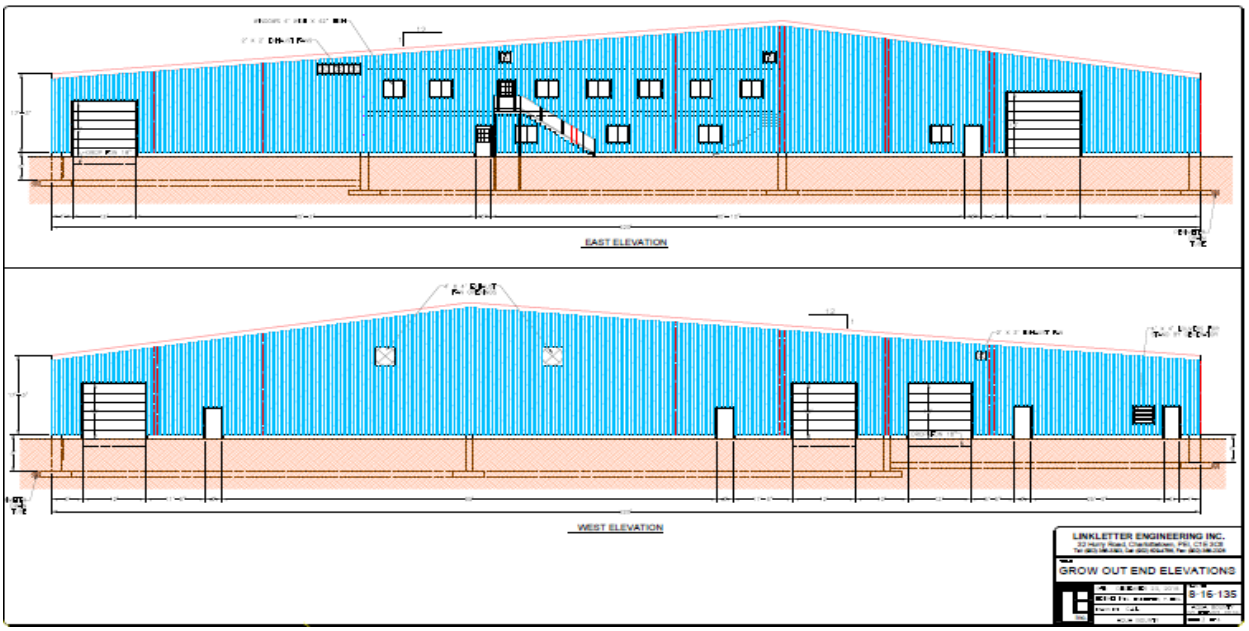
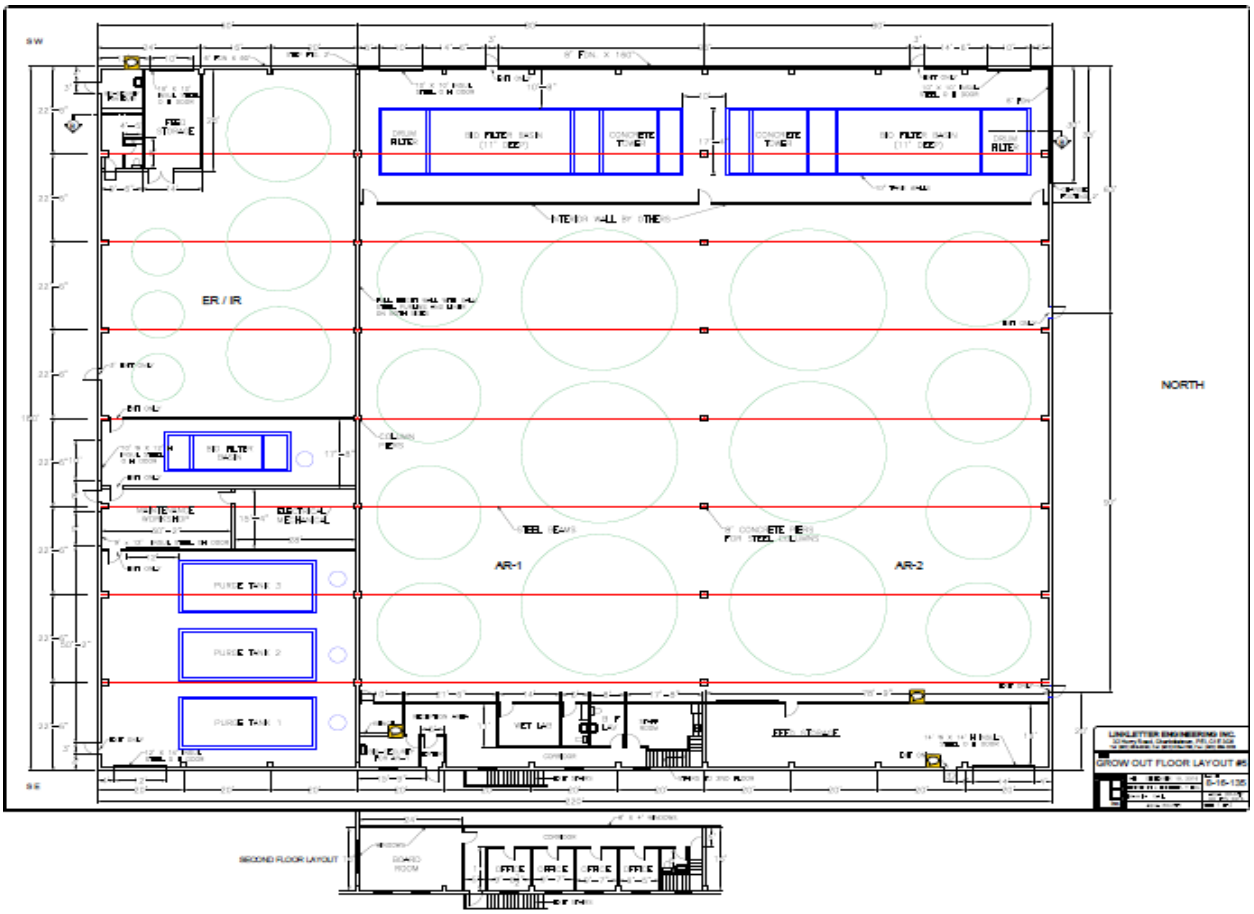


Figure 8: Commercial Grow-Out Structure (Building 3) - Layout



3.2.4 Site Services (Water, Sewer and Power)

Site services will include potable/domestic water supply provided to the current structure by the existing single on-site groundwater well with sewer services provided by an on-site septic system and associated tile field. A new potable well and on-site septic system will be constructed on the northern portion of the site to service the two new structures to be constructed as part of the proposed project. The new potable well and on-site septic system will be constructed to meet all provincial regulations.

There is a power transmission line along Route No. 2. Power to the facility is routed from this transmission line by Maritime Electric Company, Limited. Three phase power will be required for site operations.

Being a land-based farm the facility requires emergency power to ensure the site is powered at all times. As part of the existing infrastructure, a standby diesel generator which is capable of supplying power to the existing facility, is located on the subject property. Two additional diesel generators will be added to supply back-up power to the new structures. In the event of an electrical failure electricity is automatically delivered with no action by staff required. Once the utility power is restored, the power load is transferred back to the utility automatically.

3.2.5 Water Supply for Holding Tanks

Each of the Rollo Bay West facilities will operate as a 99.7% RAS (Recirculating Aquaculture System) using a small amount of make-up water provided from one (1) of our four (4) engineered PW's wells on the property. This technology allows for a very efficient and conservative approach to the use of groundwater resources as it will require very small amounts of new water to be used in the production of the fish. The layout of the proposed Rollo Bay West facilities is shown on Drawing Nos. 1 and 2 (**Appendix A**).

Historical operations at the subject site operated as a groundwater based flow-through system; water was extracted from the four (4) PWs located on the property, pumped into the facility, and introduced to the rearing tanks. The historical operation had an approved extraction permit from the PEIDCLE for 6,251 Litres per minute (LPM) or 1,375 imperial gallons per minute (igpm) allocated for the property. Table 3.2 details the six (6) wells located on the property, four (4) which can be deemed as high volume PWs. The locations of the wells and PWs are shown on Drawing No. 2, **Appendix A**.

Table 3.2: Current Groundwater Production Well Descriptions

Name	Depth	Pump Specifications	Output
Main PW	76.2 m (250 ft.)	30 HP Submersible	3,637 LPM (800 igpm)
South PW	64.0 m (210 ft.)	10 HP Submersible	1,818 LPM (400 igpm)
Lower PW	76.2 m (250 ft.)	25 HP Submersible	1,364 LPM (300 igpm)
North PW	82.3 m (270 ft.)	25 HP Submersible	1,364 LPM (300 igpm)
Cabin Well (Artesian)	36.6 m (120 ft.)	5 HP Submersible	418 LPM (92 igpm)
Domestic Well	N/A	1 HP Submersible	32 LPM (7 igpm)

As part of the original EIA and environmental permitting procedure, PEIDCLE required that a new groundwater extraction permit be obtained by AquaBounty as the estimated volume of groundwater to be utilized by new aquaculture facility is higher than the requirements outlined in Section E-9 of the *EPA* Water Well Regulations. As part of this process AquaBounty obtained a groundwater extraction permit for 6,250 L/min (1,375 igpm) to be used as a back-up in the event the RAS goes down for any length of time. The projected use of the allocated amount of water would only be expected to be utilized for short term purposes and would comply with the terms of the groundwater extraction permit issued by PEIDCLE in June 2016. As part of the requirements for the groundwater extraction permit AquaBounty completed a hydrogeological assessment including a stream assessment and 7-day pumping test in order to meet PEIDCLE's requirements (further details provided in Section 5.2).

3.2.6 Storm Water Management

Storm water flow in the area being developed will flow as per the existing drainage system for the site. Silt fences will be installed in areas where drainage is flowing to the nearby stream to protect against siltation of the stream. Storm water on the remainder of the site will drain by infiltration or overland flow. Undeveloped portions of the properties will be maintained in a natural state to help control storm water runoff.

3.2.7 Fuel Storage

A total of five (5) approved petroleum aboveground storage tanks (ASTs) are currently located on the property and will be retrained for operation at the new facility including:

- A 9,000 L double wall steel vacuum monitored AST fabricated in 2010 is currently located on the exterior to the Building 1. This tank will be re-located to the new structures on the northern portion of the property;

- Two (2) fiberglass ASTs are located in the main generator building. A 568 L AST fabricated in 2014 provides diesel to the standby generator. The second AST has a capacity of 682 L and was fabricated in 2013 and provides furnace oil for the domestic heating requirements;

- A single 909 L AST manufactured in 2013 which contains furnace oil for the domestic heat is located in the workshop.

- A single 250 L fiberglass tank with secondary containment (steel crate) fabricated in 2010 is located next to the secondary generator building that services the North PW and Lower PW.

All of the above noted ASTs are manufactured to ULC standards with the oil burning equipment installed as per CSA B-149-15.

3.2.8 Hazardous Materials Storage

No hazardous materials are proposed to be stored on site with the exception of cleaner disinfectant for the holding tanks and a small quantity of cleaning chemical for domestic cleaning.

An inventory of the types of products stored at the proposed facility is provided in Table 3-3.

Table 3-3. Hazardous Materials Storage

Activity	Potential Contaminants	Human Health Issues/Mitigation
Disinfection and cleaning of Holding Tanks:	- Atlantic 12 (Sodium Hypochlorite); - Ovadine; - Hydrogen peroxide; and - Liquid Dynemate Plus	Refer to MSDS sheet attached in **Appendix D**
Backwashing of heat exchanger	Minerals or hardness deposits may have precipitated during heating process and be present in backwash	Mostly hardness and possibly other precipitates with minor health issue.

As indicated in the above table there will be a cleaner disinfectant stored at the proposed facility. All materials such as detergents and other cleaning agents will be correctly labelled and stored in their proper containers. If products have a material safety data sheet (MSDS), the MSDS will be kept up-to-date and located in their storage location in a main binder for all staff to have access to. An emergency spill response kit will be provided on site with staff trained in the proper method of responding to spills, leaks or chemical exposure.

3.2.9 Non-Hazardous Materials Storage

Materials stored on site will be those typically involved in the aquaculture operations at the new facility. Solid waste materials generated on site will be disposed as per the requirements of the Waste Watch program operated by Island Waste Management Corporation (IWMC). All other non-hazardous waste generated at the facility will be delivered to the IWMC facility located at 100 Selkirk Road, Route 309 Dingwells Mills, Kings County.

There are quantities of non-hazardous material which will be stored at the site. A list of these with suggested mitigation procedures is provided Table 3-4.

Table 3-4. Non-Hazardous Materials Storage

Material	Potential Issue	Mitigation
Municipal Solid Waste (MSW)	Litter, leaching of contaminants	MSW to be sorted as per waste watch requirements and placed in secure storage containers. Waste, compost and recyclables to be transported to appropriate management facilities as required, eliminating odors and preventing overflow of storage containers.
Waste feed Products	Nutrients	Kept in containers and disposed of as per Waste Watch requirements.
Salmonid waste (include waste collected in effluent screening, mortalities, and inventory culls)	Litter, foul odours, pests	Waste to be bagged and frozen on site until such time that it is transported to PEI Energy Systems located at 40 Riverside Drive, Charlottetown

3.3 Operation Component

The first phase of site operations is expected to begin in the Spring 2017 with the completion of renovation upgrades to the existing main structure. The second phase of the project is scheduled to begin in May 2017 and includes the construction of two new pre-engineered steel building to be as part of the recirculated aquaculture (RAS) Commercial Production facility.

3.3.1 Use of Facility

Production: Due to space limitations at the AquaBounty facility in Fortune, commercial expansion is not feasible at this location. With the acquisition of the subject property and AquaBounty proposed plans to rear *AquAdvantage* salmon for commercial food production, the site has the capacity to produce 250 metric tons per year of 4.5 - 5 Kg Atlantic salmon. Stocking densities will be capped at approx. 86 Kg/m^3 for all production units; the total onsite biomass of the proposed site would be approximately 119,000 kilograms, with maximum feed usage at 867 kilograms per day.

Broodstock: The broodstock facility at the proposed Rollo Bay West site will have the capacity of producing upwards of 13 million eggs per year. The eggs produced at the subject site would be transferred as green eggs (not fertilized) to the AquaBounty Bay Fortune facility where fertilization and incubation would take place. Eyed eggs from conventional Atlantic salmon crosses established as part of the breeding program would be transferred back to the Rollo Bay West facility to propagate the next generations. When rearing broodstock, stocking densities are much lower than those of production stocking densities; the total onsite biomass of the

proposed site would be approximately 114,000 kilograms, with maximum feed usage at 165 kilograms per day.

Existing Hatchery Facility: The existing facility at the proposed Rollo Bay West site will have the capacity to producing approximately 2 million green eggs, as well as rear fish for performance trials. These eggs will be transferred directly back into AquaBounty's breeding program to further propagate and improve the genetic lines of the broodstock. The total onsite biomass would be around 48,325 kilograms with a maximum daily feed load of 153 kilograms per day. Based on the above an estimated 120 m^3/year of waste product (i.e., semi-solid manure) will be collected.

The feed used at the facility is a dry, extruded pellet supplied by Skretting, a commercial salmonid feed manufacturer located in St. Andrew's, NB. Tables 3.5 to 3.7 describe the number of fish that will be retained on site. Similar to AquaBounty's Fortune facility, the proposed facilities will be operated under Good Laboratory Practices and Good Manufacturing Practices; SOPs will be developed for the site to ensure the best husbandry, containment, and bio-security practices are in place and followed. The fish and facility will be monitored by both DFO and CFIA for fish health and bio-security and all additional provincial and federal regulatory requirements will be met.

Table 3.5: Inventory, Rearing Space and Water Requirements for Existing Hatchery Facility

Age	Fish size (kg)	# of Eggs Produced	# of Fish	Biomass (Kg)	m^3 Required	Rearing Density (kg/m^3)	Volume of Water Required (igpm)
4 yr. olds	10	2,128,000	266	2,660	89	30	
3 yr. olds	6	-	296	1,776	59.2	30	
2 yr. olds	1.6	-	555	888	29.6	30	
1 yr. olds	0.125	-	9,000	1,125	37.5	30	
Total		2,128,000	10,117	6,449	215.3		5.7

Table 3.6: Inventory, Rearing Space and Water Requirements for Broodstock Facility

Age	Fish size (kg)	# of Eggs Produced	# of Fish	Biomass (Kg)	m^3 Required	Rearing Density (kg/m^3)	Volume of Water Required (igpm)
4 yr. olds	10	13,152,000	1,644	23,844	1,317	18	
3 yr. olds	6	-	2,187	18,726	834	22	
2 yr. olds	1.6	-	3,279	5,193	266	19	
1 yr. olds	0.125	-	3,463	562	51	22	
Total		13,152,000	10,573	48,325	2,468		27

Table 3.7: Inventory, Rearing Space and Water Requirements for Commercial Grow-Out Facility

Age	Fish size (kg)	# of Fish	Biomass (Kg)	m^3 Required	Rearing Density (kg/m^3)	Volume of Water Required (igpm)
17 month	4.5	14,396	64,782	710	86	
14 month	2.23	14,666	32,705	460	71	
11 month	1.0	14,940	14,940	460	32	
8 month	0.34	15,219	5,174	460	11	
5 month	0.066	20,217	1,334	150	9	
2 month	0.003	20,908	63	16	4	
Total		100,346	118,998	2,256		63

3.3.2 Operating Hours

The regular operating hours for the proposed facility when in operation will typically be 7:00 am to 5:00 pm. An employee of AquaBounty will be living on-site in the staff accommodations unit located at the existing main structure (Building 1) to ensure site is operational and 24-hour security of the facility. On-call personnel will also live in close proximity to the facility for the answering of alarms in a timely and efficient manner. The site will not be accessible to the general public for bio-security and safety reasons.

3.3.3 Holding Tanks Operation and Biosecurity

The general process flow for the proposed aquaculture facilities to be operated on the property is shown on Figure 9, 10 and 11.

Figure 9: Current Hatchery Facility (Building 1) - Flow Process

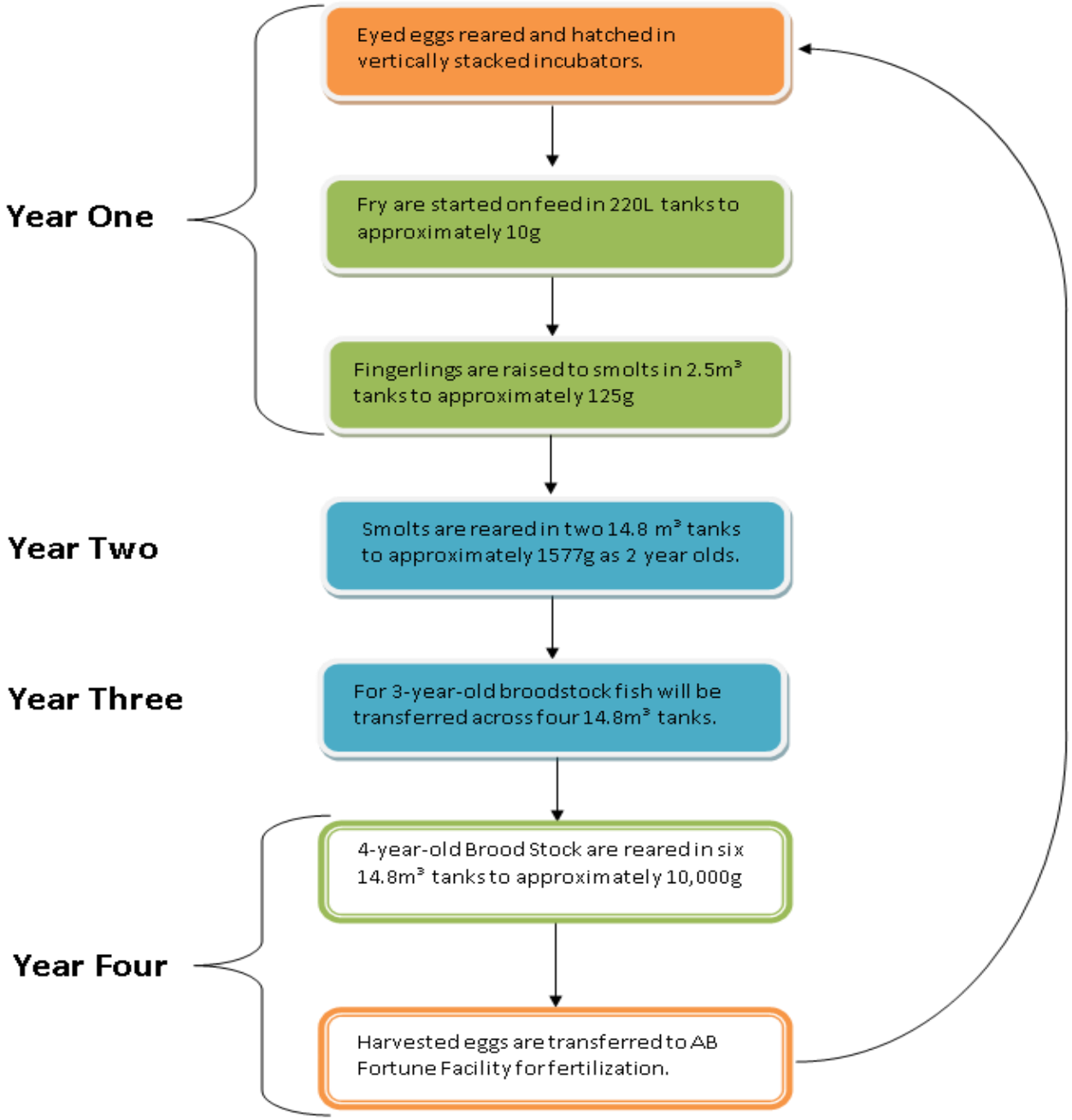


Figure 10: Broodstock Facility (Building 2) - Flow Process

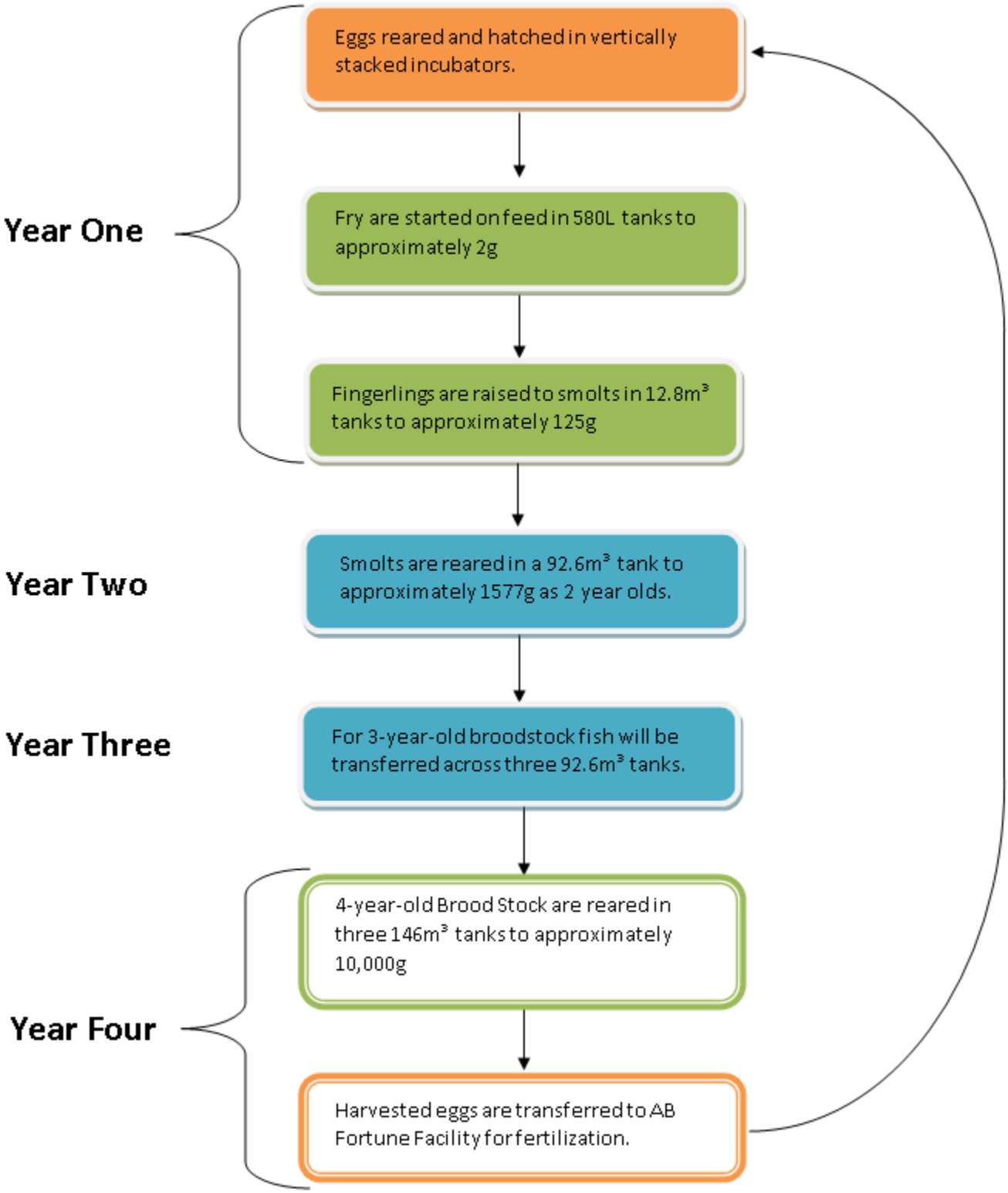
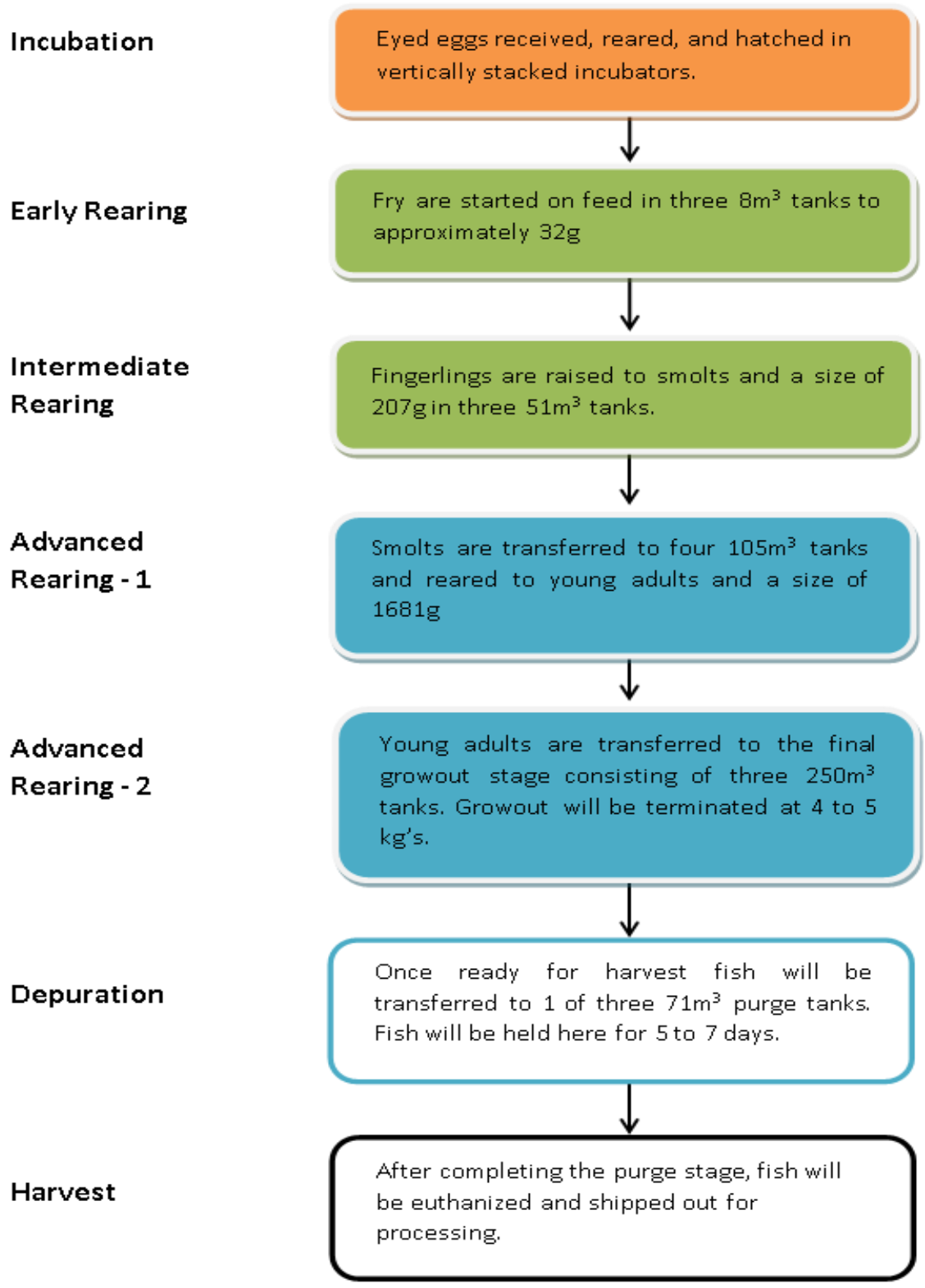


Figure 11: Commercial Grow-Out Facility (Building 3) - Flow Process



Containment will be provided for all holding tanks on the property and CFIA protocols will be in effect for all fish handling operations.

The following procedures will be covered in a set of SOPs outlining the exact protocols that will be followed at the facility:

Biosecurity measures include, but are not limited to:

1. Enclosing the tanks:

    a) All tanks will be located inside a secure engineered structure consisting of a roof, four walls, and a concrete watertight floor.

    b) Each tank will be covered with appropriate sized nylon netting to contain the fish within the tank.

    c) Drainage from each tank will pass through a minimum of four physical barriers prior to exiting the buildings.

2) Securing the facility from visitors:

    a) Each building will have a single point of entrance.

    b) All windows and doors will be locked at all times.

    c) All visitors will have to sign in to enter the facilities general area and state their prior location. They must also declare if they have been to any other fish rearing facilities within the last week. If visitors do not meet the requirements they may be prohibited from entering.

    d) If granted permission to enter the general area visitors must step their footwear into an iodophor disinfectant foot bath and sanitize their hands with an alcohol based hand sanitizer.

    e) All visitors would then be escorted by an employee to the visiting area (i.e., office or boardroom).

    f) Visitors will not be granted access to the fish rearing areas of the facilities.

    g) The site will have a live-in staff member on site to monitor and respond to alarms.

h) The site will incorporate a video surveillance system that will monitor the grounds as well as the exterior and interior of the buildings.

i) All buildings will be monitored by a 24/7 alarm monitoring system that will monitor security points and environmental equipment.

j) Alarms will be dispatched to an alarm reporting station which alerts staff and the appropriate authorities to the alarm.

3) Site and area specific equipment and staff:

a) Employees are expected to adhere to the strict bio security guidelines set out by AquaBounty Canada. Employees are expected to present themselves daily to work with clean clothes and have showered prior to arriving.

b) Staff will be designated for working in specific buildings and will only be allowed entry into another building after showering and changing their clothes.

c) Staff entering any fish rearing areas must change into area specific coveralls and rubber boots in the anti-room.

d) Staff must disinfect hands and boots upon entry to the fish rearing areas.

e) Staff which work in an AR unit at the facility will not be granted access to the ERA/IRA sections of the same facility.

f) General equipment (nets, brooms, brushes, buckets, holding tanks, oxygen meters, and pumps) will be dedicated to a specific building.

g) Equipment entering a rearing tank must be disinfected before entering another tank.

h) Specialized equipment (computers, tag readers, tools) that is needed to be moved between buildings will be permissible provided that has been thoroughly disinfected using a sanitizer or heat.

4) Cleaning and disinfection procedure: AquaBounty Canada has a set of very thorough cleaning and disinfection SOP's in place for pathogen barriers, equipment, and eggs. These SOP's are based on Aquatic and Zoo sanitary guidelines and protocols set by OIE and CFIA. Additional recommendations from product

manufacturers and veterinarians were also considered in the creation of these documents.

3.3.4 Wastewater Management

Containment and Effluent:

All tanks within the facilities will be equipped with screens constructed from rigid PVC or stainless steel and range in size from 0.1 cm to 2.5 cm depending on the life stage being contained.

The incubation system will be operated on its own RAS. This system will have 6 physical barriers including the rearing unit in place to prevent the downstream passage of eggs or alevins.

All rearing tanks will have at least one physical barrier either in the tank itself or in the attached side box to prevent the release of fish from the rearing unit. No less than 5 physical barriers will be in place to prevent the downstream passage of fish. All tanks will be tightly covered with nylon netting with sizes ranging from 0.64 cm to 1.90 cm (¼" to ¾") as required to prevent fish from jumping from the tanks. This will also serve as a barrier to contain fish within the tank should a flooding event occur.

Effluent from the hatchery will be directed to the settling pond on site. Effluent from the production and broodstock facilities will be directed to holding tanks where it will be held and pumped out by certified septic waste operators when necessary. Excess water will pass back into the stream after passing through the settling pond or wetland. When water is introduced to the holding tank/settling pond it must first pass through three perforated stainless steel screens leaving the facility building. These barriers will be cleaned daily. All containment barriers will be inspected daily by staff and all inspections and findings will be recorded on the appropriate facility forms. Any material removed from the screens will be frozen on site and sent to the incinerator at the PEI Energy Systems plant in Charlottetown for disposal. The holding tanks and settling pond will allow solids to settle out before the water re-enters the stream located on the property.

Sludge from the holding tanks/settling pond will be removed when it impacts the flow which would be after several years of operation. The sludge will be disposed at a provincially approved location (this will be dependent on the characteristics of the sludge).

Effluent treatment technologies in commercial aquaculture tend to address first and foremost the removal of particulate wastes (solids) from the process flow. The application of technologies to separate particulate waste from the system is paramount to fish health, productivity and

environmental management. In recirculating aquaculture systems, mechanical filtration using rotary drum filters is effective at removing the vast majority of solid metabolic wastes greater than 40 µm from the process water. Once removed, it is generally necessary to further concentrate the waste solids prior to disposal.

Radial-flow clarifiers, an effective device for removing solid wastes in effluent streams, will be utilized at the facilities. The simple devices have no moving parts and rely on overflow rate and an efficient hydraulic design to concentrate solid wastes. Water enters a radial-flow clarifier inside a central cylinder designed to dampen turbulence. The flow and solids are directed downward to facilitate solids settling before the clarified water flows radially toward an overflow weir located around the perimeter of the unit. A 60˚ cone-shaped bottom is effective for concentrating the wastes and facilitates flushing through a bottom port. Used in conjunction with rotary drum filters, radial flow clarifiers can effectively concentrate the drum filter backwash water to more than 8% solids content in a mechanically simple process and with minimal pressure losses (i.e., low energy requirement). The backwash from rotary drum filters will be further processed prior to discharge using settling tanks and cones. A reduction of 97%, 79% and 53% for TSS, nitrite and nitrate, respectively is expected. Once concentrated in the cone settlers, the total monthly volume of semi-moist manure to be collected is expected to be about 44 to 55 cubic meters. The semi-moist manure will be disposed of on agricultural land and tilled into the soil. The applied volume will not exceed 120 m^3/hectare/application. AquaBounty will follow the Guidelines for Manure Management of Prince Edward Island.

Table 3.8 outlines the expected water quality parameters of the effluent leaving the facility at either location. Effluent water quality will be assessed on a yearly basis during times of the highest biomass (September).

Table 3.8: Effluent Water Quality Parameters

Parameter	*Expected Level*	*Parameter*	*Expected Level*
Temperature (˚C)	~ 11.0	Nitrate-N (ppm)	≤ 6
pH	~ 8.0	Ammonia (ppm)	≤ 0.6
Dissolved Oxygen (mg/l)	~ 7.0	Total Phosphorus (ppb)	≤ 500
Total Nitrogen (ppm)	≤ 7	TSS (mg/l)	≤ 6

Note: Maximum values - based on operations at the AquaBounty facility over a 3 year period with the highest levels selected.

The volume of effluent waters that will be discharged from our facility will be less than the incoming make-up water required to maintain the RAS system from our freshwater PW's. The RAS system will have a daily percentage of water that will be evaporated from the system into

the air. This moisture will be removed from the building by way of exhaust fans connected to the RAS equipment in the bio-filtration area of the facility.

Sanitary sewage from the facility will be discharged to the existing approved on-site septic system and the new on-site septic system to be constructed on the northern portion of the subject site to service the two new buildings. The new on-site septic system will be constructed to meet all provincial regulations.

No processing will take place at the Rollo Bay site; the fish will be transported by truck to the approved processing site. Once the commercial grow-out is fully operation, fish removed from the facility will be sent to a CFIA and Provincially approved fish processing facility. AquaBounty envisions this facility will be located where existing wastewater treatment facilities are currently in place (Charlottetown or Souris Industrial Parks). Wastewater from the processing plant will be treated appropriately to ensure that the effluent meets the requirements for the wastewater treatment plant. The volume of waste from the facility will be minimal 910 kg/day which is approximately twenty-five times less than a typical lobster processing facility (i.e., 22,700 kg/day). An example of a small scale fish processing facility that meets all provincial and federal requirements for a licensed fish processing plant can be found in Victoria, Prince Edward Island. Bio Food Tech located on Belvedere Avenue currently has a small fish processing plant which is licensed for fish processing.

3.3.5 Air Quality and Noise

The main air quality issues associated with the new facility would include:

- emissions from vehicles;
- fugitive fine particulate matter (dust) possible during construction activities at the site for a short-term period; and
- Vehicles operating on site will also be expected to meet provincial vehicle inspection requirements including emissions from exhaust systems.

No odours are expected from aquaculture operations (i.e., fish farming) at the subject property as everything will be contained and secured within the site structures.

Noise is not expected to be a major issue thus noise measures other than those listed will not be necessary. The existing tree buffers will be maintained around the subject property.

3.3.6 Site Security

Access to the site will be limited to employees and visitors who are conducting business. Security for the subject site will include key access exterior doors having locks, barred windows, motion detectors, door contacts, and the facility being equipped with security cameras. Security measures will be implemented as necessary for protection of the operations on site; there will be 24 hour monitoring. If an alarm situation is detected by the security system, the information is transmitted over the telephone line to the central security dispatching centre in Halifax. To ensure that the message is being sent in the event that the telephone link is disabled, the same information is sent simultaneously by GSM digital cell back-up. Once in receipt of the alarm situation, the dispatcher immediately activates a text message to the mobile phones carried by facility personnel which indicate the channel number in alarm. Also the dispatcher telephones the facility and relays the same information verbally. Attempts at texting and telephone contact continue until an employee acknowledges the situation. The dispatcher has back-up telephone contacts in case no answer is received at the facility (i.e., after normal operation hours). It should be noted that an AquaBounty employee will be living on-site within the staff accommodations located in the existing main structure (Hatchery facility).

3.3.7 Emergency Response and Training

Multiple fire extinguishers will be provided inside all buildings and emergency call numbers for the local fire department, EMS, RCMP and environmental emergency response will be posted in prominent locations. The site is located in the Town of Souris Fire District and a fire hall is located within 7 km of the proposed site.

All site staff will be trained in emergency response basics and will be aware of all protocols for notification in the event of emergency situations.

3.3.8 Litter

Litter is not expected to be a major issue on the site and litter picking will be conducted when necessary.

3.4 Decommissioning

It is expected the life capacity of the proposed facility will be a minimum of 20 years. At some point it is understood the proposed facility will be decommissioned at the end of its service life. At that time the site will be decommissioned in accordance with the applicable standards, guidelines and regulations for that period.

Since its initial construction the building had undergone several transformations to meet the requirements of various owners. Some of the existing infrastructure is not adequate for its required function and will be decommissioned and replaced; other items have been deemed surplus or redundant and must be removed from the building. These items will be disposed of as per Waste Watch requirements or taken to a provincially approved facility. Please note that if during the removal and decommissioning of the old silo building, tanks, and foundation located on the eastern portion of the subject site hazardous building materials are identified, proper procedures for disposal according to applicable provincial regulations will be taken. The removal of these structures is considered to be an improvement to the overall aesthetics of the property

4.0 SCOPE OF ENVIRONMENTAL IMPACT ASSESSMENT

The details of the environmental impact assessment including methodology and consultation process are outlined in the following sections.

4.1 Methodology of Environmental Assessment

An EIA is an important process for reviewing potential environmental effects associated with the development of proposed projects. In order to enable the review of potential issues, an understanding and description of the environment where the proposed development will occur, or have a possible impact on, was developed from the review of existing information available for the area. The potential positive and negative interactions between the proposed project activities and the environment were identified. In the event negative interactions were anticipated and the potential effects were deemed a concern, mitigation methods were put forth for consideration.

As identified in the PEIDCLE Environmental Impact Assessment Guidelines (Revised January 2010) a complete process is completed in stages as outlined below:

- Stage 1: Describing the proposed project and establishing environmental baseline conditions for the subject site.

- Stage 2: Determining the potential environmental issues and limits of the EIA in relation to the proposed project.

- Stage 3: Accessing the potential environmental effects of the project.

- Stage 4: Identifying mitigation measures to remove/minimize potential adverse effects to the environment.

- Stage 5: Establish environmental monitoring and follow-up programs (if required).

The EIA focuses on the evaluation of Valued Environmental Components (VECs) that are those aspects of the ecosystem of associated socio-economic systems that are important to the public and other stakeholders. The VECs for the proposed project were selected based on the interactions between the proposed project activities and the environmental and known or perceived public concerns related to social, cultural, economic or aesthetic values. All Phases of the proposed project are assessed including:

- Construction;
- Operation and Maintenance;

- Accidents or malfunctions; and

- Unplanned events due to weather or other factors.

4.2 Consultation

As part of the consultation process meetings were held with representatives of the PEIDCLE to discuss the proposed project in order to determine the required scope of the environmental assessment and the overall level required for the biophysical component of the study. AquaBounty representatives also met with their design consultant and the following provincial and the following federal organizations:

- PEI Department of Agriculture and Fisheries;

- PEI Department of Communities, Land and Environment;

- Environment Canada;

- Federal Department of Fisheries and Oceans; and

- Canadian Food Inspection Agency (CFIA).

The proposed site was visited by the consultants (Joose Environmental and DE Jardine Consulting) in order to review what current site conditions and operations on the adjacent properties.

Personnel from AquaBounty met with representatives from the community to advise them of the proposed project and to receive initial feedback regarding the proposal.

PEIDCLE are reviewing the proposed new facility and will lead any required aboriginal consultation.

Stakeholders and the general public will be invited to participate in the environmental assessment process of the proposed project. It has been determined, in consultation with PEIDCLE and AquaBounty that a Level II Public Consultation will be required for the proposed project which includes a public information session. The purpose of the public consultation is to inform the residents in the local area and general public about the proposed project and any potential environmental issues. Upon submission of the EIS document, AquaBounty will post a notice in the Guardian and Eastern Graphic to advise the public of the proposed project and to announce the date, time and location of the public information session. The public notice will provide contact information for the PEIDCLE assessment coordinator to provide comments and request additional information. The EIS will be posted on the Government of PEI website (www.gov.pe.ca) along with other related information regarding the proposed project.

Comments/questions regarding the proposed project can be submitted to the PEICLE assessment coordinator for a period of ten (10) days following the public information session. Comments/questions regarding the proposed development obtained from the public and the technical review committee during the process will be outlined in Table F-1 (**Appendix F**) along with corresponding answers/responses.

5.0 SUMMARY OF EXISTING ENVIRONMENTAL SETTING

The following sections provide an overview of the existing environmental setting at the subject site.

5.1 Physical Setting

5.1.1 Surficial Geology

Based on an available surficial geology map, the native surficial soils of the subject site consist of glacial till deposits, principally comprised of a combination of gravel, sand, silt and clay. The characteristic permeability of these soils is moderate. Information obtained for soils of PEI in Kings County for the area (Soils of Prince Edward Island, Kings County - 1:75000 mapping) indicates that the surficial soil type at the subject site consists predominately of a Charlottetown

(Ch) map unit. The Ch soils are well suited for a variety of crops although erosion hazard is a limiting factor. These soils have good drainage and permeability characteristics with the slope class for the area being undulating to gently rolling.

5.1.2 Bedrock Geology

Based on an available geology maps, bedrock in the area of the subject site consists of Upper Paleozoic (Pictou Group) Lower Permian Megacyclic Sequence III - that is made up of redbeds; conglormerate, sandstone and siltstone (H.W. van de Poll, 1977). The bedrock bedding strike is approximately east-west along the axis of PEI and the flat-lying bedrock dip is north to northeast at one to three degrees (van de Poll, 1983). The depth below ground surface to the bedrock is variable but an overburden thickness of approximately 3 to 5 m would be typical in this area.

5.1.3 Topography and Regional Drainage

Based on available topographic mapping and observed site topography, the subject property is located on a groundwater divide with the southern portion (location of the main structures) sloping downward in a valley that extends to the Rollo Bay Stream that flows west to east across the southern portion of the property. The northern portion of the property slopes upward away from the Rollo Bay Stream. The southern portion of the property slopes downward to the north at an average gradient of approximately twelve (12) percent with the northern portion of the property sloping downward to the south at an average gradient of approximately five (5) percent).

5.1.4 Surface Water Drainage

Surfaces at the site currently consist of a combination of farmland and woodland on the northern portion of the subject site with the southern being developed near the south boundary and combination of grassed vegetation, wetland, pond and Rollo Bay Stream to the north of the site structures. Surface water is anticipated to drain by infiltration and overland flow into the wetland/pond/Rollo Bay Stream from both the southern and northern portions of the property.

5.2 Surface and Groundwater Resources

The subject site is located within the Rollo Bay watershed with Rollo Bay Stream flowing across the southern portion of the property west to east. As part of the Amended EIA the proposed aquaculture facility located on the subject site will now be operating as a 99.7% RAS (Recirculating Aquaculture System), thus conserving water by using only small amounts as make-up water for the RAS system. Consequently AquaBounty will no longer be a significant user of the groundwater in this watershed and therefore no significant influence on the groundwater resources or residential wells area expected in the Rollo Bay West area.

As part of the original EIS process AquaBounty was planning on using a flow through groundwater system and there the extraction of groundwater for operation of the aquaculture facility would have an impact the baseflow of the Rollo Bay Stream as determined by PEIDCLE. As part of obtaining a groundwater extraction permit for the new facility, AquaBounty completed stream flow monitoring and a 7-day pump test to determine what level of impact the future groundwater extraction for the operation of the aquaculture facility will have on the Rollo Bay Stream. The results of the pump test and stream flow monitoring were analysed and compared to the Bear River stream flow monitoring data to assess the impacts on the stream. Results indicated there is an impact on the upstream portion of the adjacent stream with a reduction of baseflow below the applicable PEIDCLE criteria (i.e., 35 %) especially during the summer months (i.e., low flow period). The groundwater assessment determined that this could be mitigated by replenishing the upper reaches of the stream with reintroduction of discharge water to a point approximately 300 m upstream of the facility. The volume of discharge water required to mitigate the reduction in baseflow to the upper reaches of the adjacent stream ranges between 40 and 80 igpm. AquaBounty will retain the groundwater extraction permit for the facility as a back-up in the event of a failure of the RAS within one of the facilities at the subject site. The use of the groundwater would only be for short term duration during repairs to the RAS. AquaBounty is committed to maintaining the overall health of the stream and will implement the mitigation as required by the PEIDCLE during the operation of the facility.

5.3 Atmospheric Environment

Air quality in the area surrounding the subject site is affected by activities associated with local traffic and commercial operations such as farming.

The nearest climate station with climate normal data is located at Monticello, which is located approximately 15 km from the proposed site. Climate normal data is available from Environment Canada for the 1981 to 2010 time period with Table 5-1 showing the normal values for each month during this time interval.

Table 5-1. Climate Normal Data 1981-2010 for Monticello (Environment Canada)

Parameter	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Daily Avg Temp (C)	-6.9	-7.0	-2.8	2.4	8.6	14.0	18.5	18.4	14.3	8.6	3.4	-2.4	5.8
Rainfall (mm)	32.6	28.9	42.2	60.0	86.7	90.7	79.3	88.9	107.9	114.8	110.6	61.8	904.4
Snowfall (cm)	68.3	52.9	44.8	26.8	3.40	0	0	0	0	0.2	13.5	55.9	265.8
Total Prec. (mm)	101	81.7	87.0	86.8	90.1	90.7	79.3	88.9	107.9	115.0	124.1	118	1,170
Wind Speed (km/hr)	na	na	na	na	na	na	na	na	na	na	na	na	na

Weather extremes for the Monticello station recorded during the period of record (1943 to 2010) as listed below:

- Extreme Maximum Temperature 34.0 °C recorded on August 10, 2001;
- Extreme Minimum Temperature: - 34.4 °C recorded on February 7, 1993;
- Extreme daily rainfall: 106.4 mm recorded on August 15, 1971;
- Extreme daily snowfall: 42.0 cm recorded on March 5, 1964;
- Extreme snow depth: 244 cm recorded on January 24, 1971;
- Average date of last spring frost: May 29th;
- Average date of first fall frost: October 15th; and
- Average length of frost free period: 138 days.

5.4 Terrestrial Environment

No rare or native plant species or endanger wildlife are suspected to be presence on the subject site as the property has been used for aquaculture proposes for 37 years. All development will be located within the existing developed area with no impact to the trees and vegetation on the subject site.

The results of a bird, mammal and botanical database review conducted by Ms. Fiep de Bie and Ms. Dianne Griffin are included in **Appendix E**. A summary of Ms. Fiep de Bie's findings is outlined below:

"Approximately 60% of the proposed 36.7 acre site is woodland and 40% field. Some areas are mixed hard and softwoods and some are softwood only. There is a black spruce plantation and a white spruce plantation at this site. Trees in the non-plantation forest (other than a fairly recent clear-cut) are 14-16 meters in height and considered young woods.

This habitat may support various common wildlife species such as Red squirrel, Raccoon, Snowshoe hare, Red fox and Coyote. The stream on the property will attract wildlife species and it is advised to maintain and enhance a riparian zone to protect the stream and support a wildlife corridor.

During the 2006-2010 Maritime Breeding Bird Survey, five "Sensitive", one "May be at Risk" and one "At risk" bird species were found within the 10 x 10 km survey square (20NS53), in which the AquaBounty site is located. Species with S1, S2 and S3 ranking found in the square are: Killdeer (S3B, Sensitive), Common Tern (S2B, May be at risk), Olive-sided Flycatcher (S3B At risk), Philadelphia Vireo (S1 S2B, Sensitive), Eastern Kingbird (S3B, Sensitive), Rose-breasted Grosbeak (S3B, Sensitive) and Bobolink (S3B, Sensitive). The status of the Olive-sided Flycatcher (*Contopus cooperi*) is threatened under COSEWIC. An Olive-sided Flycatcher was found in survey square during the Maritime Breeding Bird Atlas surveys, but not at the AquaBounty site. A Bobolink (threatened) was found in the square, but no location was found. There were two Barn swallow (threatened) records in 2008, and UTM coordinates for only one sighting (May 31, 2008). It was not found at the proposed construction site."

A summary of Ms. Dianne Griffin's findings are outlined below:

"The vegetation on the AquaBounty site consists of some native species near or at the stream edge as well as a number of introduced or weedy species around the existing tanks and into the proposed expansion area.

The native species include Broad-leaved Cat-tail, Soft Rush, Speckled Alder, Red Raspberry, Larch, Wild Rose and grasses. Two Cedar bushes were obviously planted for ornamental purposes.

Non-native species include Evening Primrose, Queen Anne's-lace, asters, goldenrods, grasses, Common St. John's-wort, Tuffed Vetch, Yarrow, Common Plantain and Strawberry.

There are no rare, uncommon or floral species of special concern within or near the commercial operation expansion area on this property. It is primarily land which has been heavily disturbed by development and the invasion of weedy plants.

The woodland north of the stream consists of White Spruce and Balsam Fir with some Pussy-willow and Wild Rose on the edge. The woodland ground herbaceous plants include Wood Fern and other common plants. It appears that the proposed expansion of the AquaBounty operation will have no impact on the woodland as it will be located on the other side of the stream."

5.5 Human Environment

The subject site has been developed at its present location as a licensed aquaculture facility since 1978 (37 years). Prior to development as an aquaculture operation the area was utilized as farmland and woodlot.

As noted in Section 4.2 PEIDCLE are reviewing the proposed new facility and will lead any required aboriginal consultation.

A representative of the PEI Executive Council Office on Intergovernmental and Public Affairs was contacted as part of this assessment to determine if there are any archaeological concerns regarding the proposed project. The response from the representative indicated they did not have any concerns however it was noted that during construction operations should items of potential cultural significance be discovered activities will be halted until they are assessed by archaeological authorities (as per the *PEI Archaeology Act and Archaeology Act Regulations*). The site has been an active aquaculture facility for 37 years and has been actively farmed for over a century prior to this so no major findings are expected.

6.0 PROJECT INTERACTIONS WITH THE ENVIRONMENT (VECS TABLE)

A qualitative review of the potential interaction that the construction and operation of the proposed Rollo Bay West aquaculture facility would have on the specific VECs that are of particular value or interest to regulatory agencies, the public and other stakeholders are outlined in Table 6.1.

The residual impacts rating for each of the VECs assessed is based on the following significance:

> 0 = No residual impacts expected as the environmental effects are not considered significant.
>
> 1= Insignificant - interaction occurs however based on the mitigation in place the environmental effects are not consider significant.

2= Significant - interaction could result in an environmental effect even with mitigation in place.

Table 6-1. Proposed Project - VECs Interactions and Mitigation

VECs	Description of Effects	Required Mitigation	Residual Impact Rating
Land Use	Project footprint is consistent with current land use in the developed area of the site (existing aquaculture facility since 1978). Adjacent and surrounding land use consists of a mix of residential, agricultural land and woodlot. The subject site has historically been utilized as a licensed aquaculture facility since 1978 and prior to that was utilized as farmland dating back to 1935 or earlier.	None	0
Groundwater Resources	Water for domestic use will be supplied to the current facility with the existing on-site potable well. A new potable well will be drilled on the northern portion of the property to service the two new structures. The aquaculture operation will operate as a 99.7% RAS (Recirculating Aquaculture System), thus conserving water by using only small amounts as make-up water for the RAS system. The groundwater supply wells will only be used to supplied make-up water and in the event of a failure of the RAS within one of the facilities at the subject site. Currently AquaBounty has a groundwater	None The new potable well will be constructed according to the Provincial Regulations. Testing and monitoring completed to determine volume of water and periods during the year to divert a portion of the discharge from the facility upstream (approximately 300 m) to replenish stream baseflow. Will only be required if RAS is down for an extended period of time.	0 1

VECs	Description of Effects	Required Mitigation	Residual Impact Rating
	extraction permit and will be retaining it for emergency purposes.		
Wastewater	Sanitary wastewater will be discharged to the current onsite septic system for the existing facility. Sanitary wastewater for the two new structures to be constructed on the northern portion of the subject site will be discharged into a new on-site septic system. Refer to Section 3.3.4 for details on handling of effluent generated at the proposed facility.	None New on-site septic system to be constructed according to Provincial Regulations.	0 1
Terrestrial Environment	Disturbance of the terrestrial environment will be minimal and limited to the previously disturbed areas (i.e., aquaculture operation). No rare plants or at risk species reported on site.	None	0
Air Quality	Excess noise and dust caused for the short term and locally during the construction phase of the development.	Appropriate noise suppression, dust control as per standard construction practices that adheres to the applicable PEIDCLE and PEI Occupational Health and Safety Regulations.	1
First Nation/Aboriginal Communities	PEIDCLE are reviewing the proposed new facility and will lead any required aboriginal consultation.	None	0
Health and Safety	Project activities during construction and operation (including accidents, potential malfunctions and unplanned events) could result in risk to the	Proper safety procedures must be followed during the duration of the project as per applicable municipal, provincial and federal regulations. In addition, the	1

VECs	Description of Effects	Required Mitigation	Residual Impact Rating
	public or workers if not carried out in a safe and proper manner. The construction and operation of the facility is subject to the PEI Occupational Health and Safety regulations. Proper safety procedures must be followed during the duration of the project as per applicable provincial and federal regulations.	facility will be constructed and operated following all applicable provincial and federal codes (including best management practices for construction.	
Road Transportation	During construction, materials and supplies will be transported to the site with construction workers traveling to the site by passenger vehicle. During operation, employee vehicles and light trucks to delivery supplies will be accessing the facility on a regular basis.	During construction and operation, the project site will be accessed by existing roadways with all facility related vehicles obeying provincial traffic laws and corresponding Transport Canada Regulations.	1
Archaeology, Paleontology and/or Heritage Resources	Project will have minimal ground disturbance. Construction of the facility will require removal of fill materials and placement of structural fill. The areas of the site to be developed have been previously disturbed (farmland and licensed aquaculture facility for 37 years) and it is unlikely to interact with archaeology, paleontology and heritage resources.	A representative of the PEI Executive Council Office on Intergovernmental and Public Affairs was contacted as part of this assessment to determine if there are any archaeological concerns regarding the proposed project. The response from the representative indicated they did not have any concerns however it was noted that during construction operations should items of potential cultural significance be discovered activities will be halted until they are assessed by archaeological authorities (as per the PEI Archaeology Act and Archaeology Act Regulations).	0

VECs	Description of Effects	Required Mitigation	Residual Impact Rating
Environmental Effects	Environmental effects refer to forces of nature (i.e., severe weather, earth quakes, etc.) that could affect the project physically or hamper construction or operation of the facility.	Compliance with provincial and federal codes, standards and best management practices that inherently account for the potential environmental effects on the project.	1

Significance of residual impacts rates as follows: 0 = None; 1= Insignificant; 2 = Significant.

7.0 CONCLUSION AND RECOMMENDATIONS

The Amended EIA for the proposed project was completed as per Section 9 of the PEI *EPA.* The Amended EIA evaluated the potential environmental effects of the proposed project taking into consideration all activities required for the construction, operation and maintenance of the facility.

As part of the Amended EIS the following mitigation and environmental monitoring elements will be adhered to during the construction and operation of the proposed facility, including:

Mitigation

- During construction and operation (including accidents, potential malfunctions and unplanned events) all provincial and federal codes, standards and best management practices will be followed; and

- During operation mitigation for hazardous waste and non-hazardous waste will be conducted as outlined in Tables 3.3, 3.4 and 3.5 in Sections 3.2.8 and 3.2.9 of this report.

Environmental Monitoring

- During the construction period the construction manager will conduct regular environmental monitoring site inspections to ensure all construction components adhere to all municipal, provincial and federal regulations and codes; and

- Monitoring of the effluent being discharged into the adjacent stream including samples being collected and analyzed for parameters required by the owners of the utility and the PEI Department of Communities, Land and Environment (PEIDCLE) once a year.

Based on the information obtained during the completion of the Amended EIA, Joose Environmental and DE Jardine Consulting has concluded that the potential environmental effects of the proposed project for all VECs would not be significant during the construction, operation and maintenance of the proposed facility with the planned mitigation and monitoring elements in place. Consequently, it is recommended that the proposed project should proceed as described and outlined in this report.

8.0 CLOSURE

This report has been prepared for the sole benefit of AquaBounty Canada Inc. and its Subsidiaries. The report may not be used by any other person or entity without the express written consent of Joose Environmental Consulting Inc., DE Jardine Consulting and AquaBounty Canada Inc. and its Subsidiaries. Any uses which a third party makes of this report, or any reliance on decisions made based on it, are the responsibility of such third parties. Joose Environmental accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Some of the information presented in this report was provided through existing documents and interviews. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, we in certain instances have been required to assume that the information provided is accurate.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Joose Environmental based on the data obtained during the assessment. Due to the nature of the assessment and the limited data available, Joose Environmental cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be construed as legal advice.

This report was prepared by Mr. Don Jardine, B.Sc. and Mr. Peter H. Joostema, FEC, P. Eng., CESA. We trust this report contains all of the information required at this time, and we are available at your convenience should you have any questions.

Sincerely,

JOOSE ENVIRONMENTAL CONSULTING INC. and DE JARDINE CONSULTING

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9.0 REFERENCES

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Committee on the Status of Endanger Wildlife in Canada (COSEWIC) - October 2014

Environment Canada - Atmospheric Environmental Services. Monticello Climate Normal for period 1981 - 2010.

Government of Canada - Species at Risk: www.sararegistry.gc.ca

Historical Places of Prince Edward Island - http://www.gov.pe.ca/hpo/

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Soil of Prince Edward Island - Research Branch Agriculture Canada (1988).

Van de Pol, H.W. (1983) Geology of Prince Edward Island - Department of Energy and Forestry, Energy and Minerals Branch.

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Information from Personal Sources

PEI Department of Communities, Land and Environment:

- Mr. Greg Wilson, Manager Environmental Land Management
- Mr. Dale Thompson, Environmental Officer
- Ms. Roseanne MacFarlane, Freshwater Fisheries Biologist

PEI Department of Fisheries, Aquaculture and Rural Development:

- Mr. Neil McNair, Director of Aquaculture

PEI Executive Council Office - Intergovernmental Public Affairs

- Dr. Helen E. Kristmanson, Director, Aboriginal Affairs and Archaeology
- Ms. Erin Mundy, Archaeologist

Souris Wildlife Federation:

- Mr. Fred Cheverie

APPENDIX A

Figure and Drawings

JOOSE ENVIRONMENTAL

SITE LOCATION PLAN

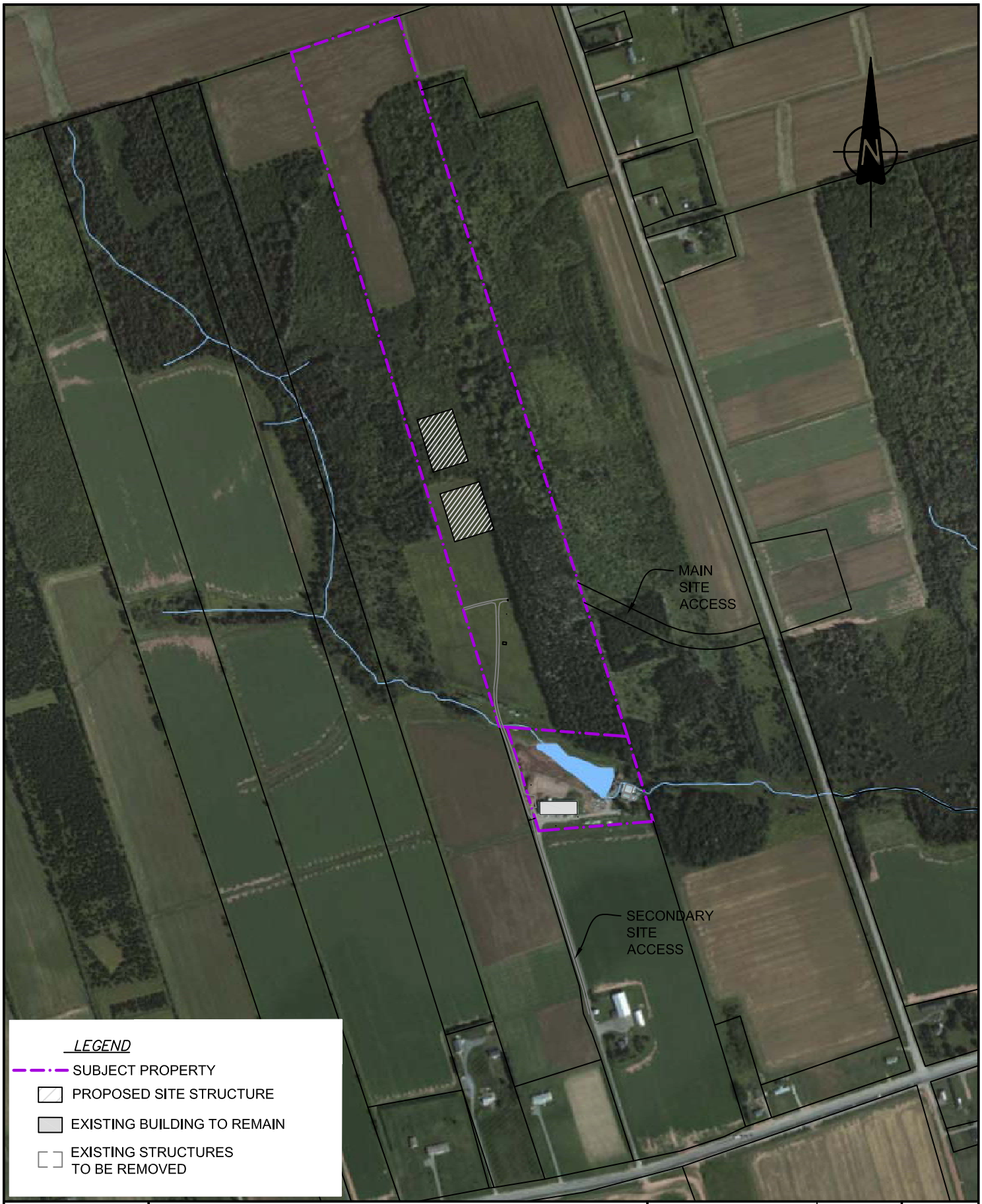
UPDATED ENVIRONMENTAL IMPACT STATEMENT

1300 ROUTE 2, ROLLO BAY, KINGS COUNTY, PEI

CLIENT: AQUA BOUNTY CANADA

SCALE:	JOB NO.:	FIG NO.:
1 : 50 000	JE0219	1

DATE	DWN BY:	APPD BY:
2017/04/12	MLJ	PHJ



JOOSE ENVIRONMENTAL

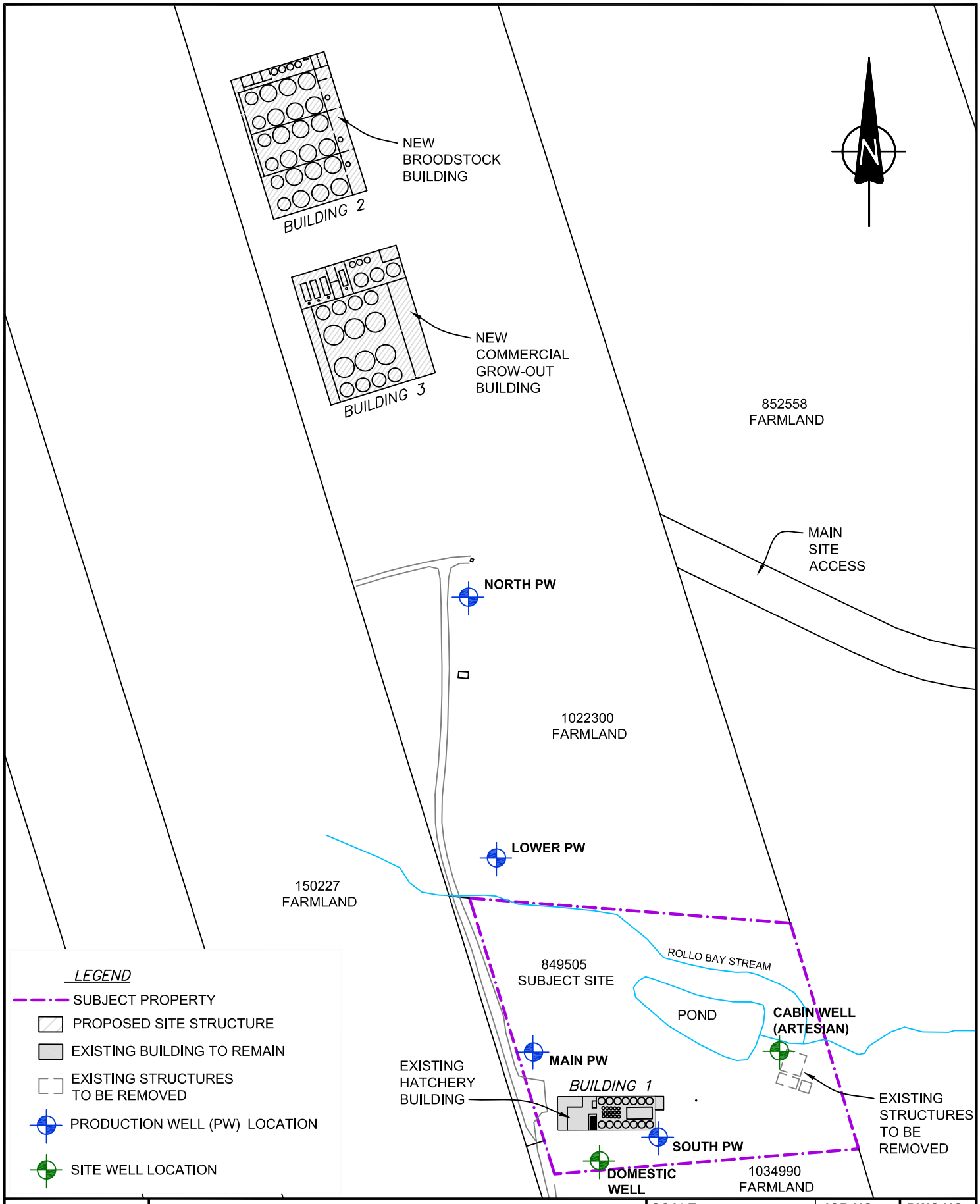
SITE PLAN & ADJACENT PROPERTIES

UPDATED ENVIRONMENTAL IMPACT STATEMENT

1300 ROUTE 2, ROLLO BAY, KINGS COUNTY, PEI

CLIENT: AQUA BOUNTY CANADA

SCALE:		JOB NO.:	DWG NO.:
NTS		JE0219	1
DATE	DWN BY:	APPD BY:	
2017/04/12	MLJ	PHJ	



JOOSE ENVIRONMENTAL

SITE PLAN & ADJACENT PROPERTIES

UPDATED ENVIRONMENTAL IMPACT STATEMENT

1300 ROUTE 2, ROLLO BAY, KINGS COUNTY, PEI

CLIENT: AQUA BOUNTY CANADA

SCALE:	JOB NO.:	DWG NO.:
1 : 2500	JE0219	2

DATE	DWN BY:	APPD BY:
2017/04/12	MLJ	PHJ

APPENDIX B

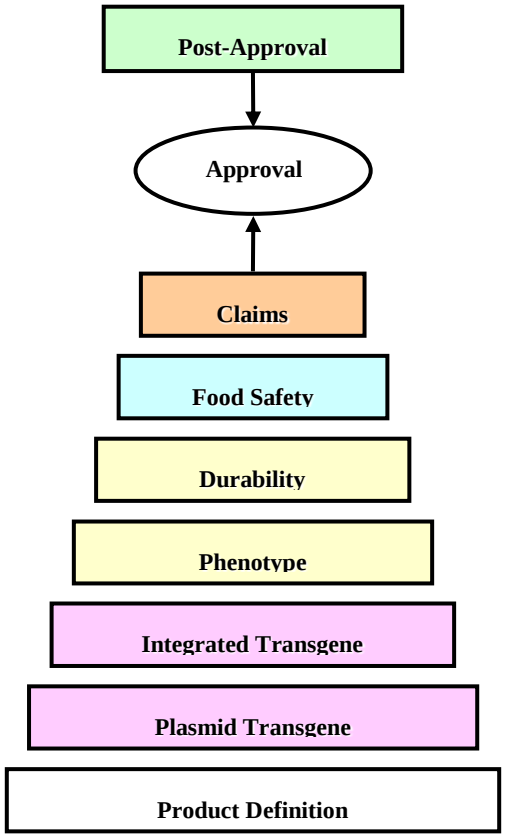
AquaBounty Regulatory History

Regulatory History

In the US, ABT established an Investigational New Animal Drug (INAD) file in 1995 with the Center for Veterinary Medicine (CVM) of the United States Food and Drug Administration (FDA) to pursue the development of AquAdvantage® Salmon (AAS), a genetically-engineered Atlantic salmon with a rapid-growth phenotype for use in commercial aquaculture.

The development of AquAdvantage Salmon was pursued from that point on with oversight by the Office of New Animal Drug Evaluation (ONADE), subject to the traditional paradigm for review and approval of veterinary drug products per the submission of a New Animal Drug Application (NADA). An environmental assessment of the facility submitted by ABT to CVM in December 2001 resulted in the issuance of a Finding of No Significant Impact (FONSI) in December 2003. In 2006, a new paradigm for GMO review and approval was released by the CVM, and ABT's submission was tailored to the new approach.

Figure 1 GMO Paradigm Obligate Review Process



Since ABT had already submitted studies detailing the development and characterization of the plasmid form of the AquAdvantage transgene, development of the AquAdvantage Salmon

line, and characterization of the integrated AquAdvantage transgene therein, step-wise review of the Transgene Construct (opAFP-GHc2) and the Integrated Transgene (EO-1α) proceeded directly. These reviews resulted in CVM requests for additional information that was submitted in the form of Supplements to the existing submissions to which they were most directly related. CVM consideration of the human food safety studies submitted in 2004 (Composition of Muscle-Skin) and 2006 (Allergenicity of Muscle-Skin) was completed after the reviews for characterization of Phenotype and Durability, which required animal safety, effectiveness, and methods-development studies. In anticipation of prospective product approval, a four-person team from ONADE and the FDA Foreign Inspection Service (FIS) conducted a formal inspection of the aquaculture facility in Fortune, PE, on October 7-9, 2008 and the facility was approved by the FDA for the manufacture of AquAdvantage eggs. By 2009, ABT completed the dossier required for subsequent step-wise reviews and NADA approval.

For research on transgenic fish, the ABT Fortune facility was judged effective by Environment Canada in reducing potential impact to a level compliant with the legal requirement for "no release" in 1996 and has been inspected annually by Environment Canada enforcement for physical containment. The facility was also subject to regular inspections under Schedule II of the Fish Health Protection Regulations by the Department of Fisheries and Oceans (DFO) from 1996 to 2015. Since 2012, the Fortune facility has been inspected periodically by CFIA under the National Aquatic Animal Health, Compartmentalization Program.

Representatives of ABT met with Canadian regulatory authorities in November 2000 to present a draft development plan for AquAdvantage Salmon, at which time advice was solicited regarding the prospective requirements for a product approval in Canada. Representatives of ABT met with Canadian authorities again in April 2005 to present a detailed review of U.S. technical and regulatory developments that had occurred in the interim.

In November 2008, ABT provided an incremental summary of developments within the GMO-review paradigm.

United States Food and Drug Administration – New Animal Drug Approval

As mentioned previously, the regulatory process with the FDA was long and detailed, primarily because AquaBounty Technologies was the first company to ever request approval for a transgenic animal for manufacture and human consumption. For the purposes of U.S. regulatory approval, the prospective Product Definition, Product Claim, and Conditions-of-Use for AquAdvantage Salmon are as follows:

- *Definition:* A triploid Atlantic salmon (Salmo salar) bearing a single copy of the stably integrated α-form of the opAFP-GHc2 gene construct at the α-locus in the EO-1α line.

- *Claim:* AquAdvantage Salmon grow to a mean body weight of 100 g within 2700 degree-days of first-feeding when fed to satiety in water temperatures characteristic of present day farming operations.

- *Use:* Eyed-eggs for triploid, hemizygous, monosex fish sold for grow-out in physically contained, freshwater production facilities.

As per the paradigm in Figure 1 above, AquaBounty was required to provide data to the FDA on the following topics. All studies completed and data collected by AquaBounty, and all contract research organizations used for analysis operated under Good Laboratory Practices and Good Clinical Practices.

- Characterization of the transgene construct and transgene integrant;
- Inheritance and stability of the transgene integrant;
- Safety of the genetic change to the salmon;
- Growth efficacy of the product;
- Triploid efficacy; and
- Nutritional and hormone compositional analysis for food safety and allergenicity potential.

The following link will direct you to all USFDA approval documents and review material available to the public.

U.S. Food and Drug Administration – AquAdvantage Salmon Approval Docs

Environment Canada - New Substance Notification Submission

The Government of Canada follows the *Canadian Environmental Protection Act*, 1999 (CEPA 1999) to ensure that all new substances, including organisms, are assessed for their potential harm to the environment and human health. This process is overseen by Environment Canada (EC) and Health Canada (HC). The New Substances Notification Regulations (NSN) under this Act describes the information that must be provided to EC prior to the manufacture of products such as AquAdvantage Salmon in Canada.

In 2011 AquaBounty Technologies began compiling information for a NSN for AquAdvantage® Salmon; the final package was submitted in April 2013 to Environment Canada. This package included, but was not limited to information on the following areas.

- Detailed description of AquAdvantage Salmon, including the product development, product identification, and biological and ecological characteristics;

- Manufacturing methods, location descriptions, and quality control and assurance systems:

    - A lot of detail was included on multiple redundant physical barriers (containment) of AquAdvantage Salmon, including over 100 photographs of the facility.

- Methods of introduction and disposal;

- Proposed and potential environmental effects of the product;

- The potential for adverse human health effects; and

- All other information collected or submitted to other regulatory bodies was included in the notification.

As part of the review process, Fisheries and Oceans Canada (DFO) was tasked in conducting an environmental and indirect human health risk assessment for the AquAdvantage Salmon product and recommending any necessary measures to manage risks. This peer reviewed information was then provided to the Minister of Environment for consideration during the regulatory approval process. Areas of risk concern evaluated during the assessment included:

- Does the product have or may have an immediate or long-term harmful effect on the environment or its biological diversity;

- Does the product constitute or may constitute a danger to the environment on which life depends; or

- Does the product constitute or may constitute a danger in Canada to human life or health.

Also as part of the risk assessment, a DFO employee with previous fish rearing experience visited the facility in Fortune and reviewed all fish rearing units and all levels of physical containment and security in the facility.

This National Science Response Process on the Environmental and Indirect Human Health Risk Assessment of AquAdvantage® Salmon can be found using the following link.

Summary of the Environmental and Indirect Human Health Risk Assessment of AquAdvantage® Salmon

Later in 2013, after the review of over 18,000 pages of documentation, AquaBounty Technologies receives authorization to manufacture eggs at AquaBounty Canada's hatchery for commercial sale. Environment Canada advises AquaBounty Technologies that based on the current proposal in the New Substances Notification (Organisms), AquAdvantage® Salmon is not considered to be a risk to the environment.

The following links will take you to information about the review process and product on EC and/or DFO's websites.

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_023-eng.pdf
http://www.gazette.gc.ca/rp-pr/p1/2013/2013-11-23/pdf/g1-14747.pdf

Health Canada and Canadian Food Inspection Agency - Novel Foods and Novel Feeds Submissions

In 2012, AquaBounty Technologies submitted documentation for a Novel Foods Pre-Market Submission for AquAdvantage® Salmon to Health Canada and an application to the Canadian Food Inspection Agency to register AquAdvantage® Salmon as a Novel Feed. During the review process both agencies assessed the product's safety and nutritional components for both food and for use in animal feeds.

Health Canada is responsible for ensuring that all novel foods in Canada are safe for human consumption and is nutritious. AquaBounty Technologies was required to submit detailed information to Health Canada outlining exactly how the product was developed and all supporting information for the review process that was required. The information was evaluated by trained scientists, and the following areas were examined:

- How the modified product was developed, including the genetic modification in the product;
- How AquAdvantage Salmon compares to conventional Atlantic salmon in terms of composition (e.g., fats, proteins and carbohydrates) and nutrition quality;
- The potential for production of new toxins in the food;
- The potential for causing allergic reactions; and
- The microbiological and chemical safety of the food.

CFIA is responsible for evaluating and regulating all feed ingredients, including novel feeds derived from GM organisms. Before being allowed on the Canadian market as a feed ingredient,

AquAdvantage salmon was required to undergo a pre-market assessment and approval. The purpose of all feed assessments is:

- to ensure the feed ingredient is safe in terms of animal health;
- to ensure the feed ingredient is safe in terms human health via food residues and worker/by-stander exposure;
- to ensure the feed ingredient is safe for the environment; and
- to ensure the feed ingredient is effective for its intended purpose (i.e. nutritious).

ABT was required to provide extensive data to satisfy the requirements for the safety and nutrition assessments, including how AquAdvantage Salmon was developed, how the rapid growth during early life trait functions and nutritional composition of the fish.

In May 2016, both agencies determined that AquAdvantage salmon are just as safe and nutritious as conventional salmon for both humans and livestock.

The following links will take you to information about the review process and product on Health Canada's and CFIA's website.

http://www.hc-sc.gc.ca/fn-an/gmf-agm/appro/aquadvantage-salmon-saumon-faq-eng.php

http://www.hc-sc.gc.ca/fn-an/gmf-agm/appro/aquadvantage-salmon-saumon-eng.php

http://www.hc-sc.gc.ca/fn-an/gmf-agm/appro/aquadvantage-salmon-saumon-decision-eng.php

http://www.inspection.gc.ca/plants/plants-with-novel-traits/approved-under-review/decision-documents/dd2016-117/eng/1463076782568/1463076783145

Health Canada - AquAdvantage Salmon Approval Docs

Summary of Regulatory Approvals:

- In 2008, The FDA inspects and approves AquaBounty Canada's hatchery in PEI as an authorized manufacturing site for production of AAS eggs.
- In 2009, The FDA inspects and approves AquaBounty Panama's site for the production of AquAdvantage® Salmon for import into the US.

- In 2010, AquaBounty Technologies receives section complete letters from the FDA on all seven parts of the New Animal Drug Application for AquAdvantage® Salmon. The FDA convenes its Veterinary Medicine Advisory Committee (VMAC) in a public meeting to review its findings of AquAdvantage® Salmon, which concluded that it is indistinguishable from Atlantic salmon; that it is safe to eat; and that it poses no threat to the environment under its conditions of use. The VMAC concurs with the FDA; AquAdvantage® Salmon is safe to consume, and safe for the environment.

- In 2011, the FDA consults with the National Marine Fisheries Service of NOAA and the U.S. Fish and Wildlife Service, which concur with the FDA's "no effect" findings that the AquAdvantage® Salmon do not pose a threat to the environment.

- In 2012, the FDA releases its draft environmental assessment (EA) and publishes in the Federal Register a preliminary Finding of No Significant Impact (FONSI) for AquAdvantage® Salmon.

- In 2013, publication of a Significant New Activity Notice by Environment Canada. AquaBounty Technologies receives authorization to manufacture eggs at AquaBounty Canada's hatchery for commercial sale. Environment Canada advises AquaBounty Technologies that based on the current proposal in the New Substances Notification (Organisms), AquAdvantage® Salmon is not considered to be a risk to the environment.

- In 2015, the USFDA formally approves the manufacture and sale of AquAdvantage salmon as detailed in our application.

- In 2016, both the Novel Foods (Health Canada) and Novel Feeds (CFIA) applications are approved.

Post Approval

AquaBounty is still monitored by Environment Canada Enforcement for physical containment of AquAdvantage Salmon; AquaBounty is inspected as required by enforcement. AquaBounty is also part of the National Aquatic Animal Health Compartmentalization Program that is administered by CFIA. The facility is inspected for biosecurity measures as required and submits fish for health screening as part of the Compartment maintenance.

On a semi-annual basis AquaBounty must supply the FDA with Periodic Drug Experience reports and if any adverse events occur the Company is required to report them to the FDA in a timely manner.

APPENDIX C

PEIDTIE Site Access Approval

From:	Jonathan Veinot
To:	Peter Joostema (pjoostema@jooseenv.com)
Cc:	Dawn Runighan
Subject:	FW: Entrance permitting
Date:	Friday, April 7, 2017 11:01:40 AM

Peter,

Please see the reply below from Kevin Campbell of transportation.

Jon

Jon Veinot / Assistant Facility Manager
jveinot@aquabounty.com
http://www.aquabounty.com
(902) 687-2600

From: Kevin Campbell [mailto:jkcampbell@gov.pe.ca]
Sent: April-07-17 10:03 AM
To: Jonathan Veinot <jveinot@aquabounty.com>
Subject: Re: Entrance permitting

Good morning, we only issue Entrance Way Permits for entrance ways on Arterial Highways or seasonal roads. In the case of your new entrance way on Route 307, Bear River Road, that only need approval from this Department and since a work order was issued for the installation that means approval as well.

Let me know if you require anything further.

>>> Jonathan Veinot <jveinot@aquabounty.com> 4/6/2017 2:49 PM >>>
Hi Kevin,

I was just looking for a note outlining the issuant of permits for new entrances.

Thanks in advance,

Jon

Jon Veinot / Assistant Facility Manager
jveinot@aquabounty.com
http://www.aquabounty.com
(902) 687-2600

APPENDIX D

Cleaning/Disinfectant Solutions - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION AND PREPARATION INFORMATION:

Product Name: Sodium Hypochlorite WHMIS Class:C,E

Trade Name: ATLANTIC-12

Product Use: Disinfection, odour control, laundry, water, sewage and industrial waste treatment.

Supplier Name & Address:
Atlantic Chemical & Aquatics Inc.
380 Bluewater Road
Bedford, NS
B4B 1J3
(902) 835-5884

Distributor Name & Address:

Prepared by: Atlantic Chemical & Aquatics Inc.

Emergency Phone Number: CANUTEC (613) 996-6666

Preparation Date: April 16 2014

SECTION II - HAZARDOUS INGREDIENTS:

Ingredients	CAS#	WT %	ACGIH-TLV	LC 50	LD 50
Sodium Hypochlorite	7681-52-9	7-13	Not Available	Not Available	Not Available

SECTION III - PHYSICAL DATA:

Boiling Point (°C): 105
Special Gravity(H20=1): 1.168
Vapour Pressure(mmHg):22@20(°C)
Freezing Point (°C):-15
Vapour Density(Air=1): Not Available
Evaporation Rate(BuAc=1): Not Available
Percent Volatile (Wt%):80
pH(100%): 12.8 Min.
Physical State: Liquid
Solubility in Water: Soluble
Odour: Typical chlorine bleach
Viscosity @ 20°C: Water thin
Appearance: Clear lime-yellow solution

SECTION IV - FIRE AND EXPLOSION DATA:

Flammability: Not flammable
Flash Point deg.(C,TCC): None
LEL: None UEL: None
Hazardous Combustion Products: None
Means of Extinction: If involved in fire use
Special Fire Hazards: None
water, carbon dioxide or other Class B extinguishers.

SECTION V - REACTIVITY DATA:

Conditions for Chemical Instability: Yes ..x.... No..... If YES, Under which condition: High Temperatures
Incompatible Materials: Metals, reducing and oxidizing agents, solvents, acids, nitrogen compounds and most organic substances.
Hazardous Decomposition Products: None

SECTION VI - TOXICOLOGICAL PROPERTIES:

Route of Entry: ..x..Eyes ..x.. Skin Contact .....Skin Absorption ..x..Inhalation ..x..Ingestion

Effects of Acute Exposure: Will cause moderate irritation to skin and severe irritation and pain to eyes. Fumes may irritate mucous membranes and cause coughing or pulmonary edema. If ingested product will cause membrane irritation and pain and inflammation to digestive tract.Could cause vomiting and shock.

Effects on Chronic Exposure: Same as Acute Exposure.

Irritancy: Moderate to severe.

Carcinogenicity: Not by IARC conclusions.

Teratogenicity, Mutagenicity, Reproductive Effects: Not established.

Synertistic Materials: None
Respiratory Tract Sensitization: May irritate mucous membranes if exposure is prolonged.

SECTION VII - PREVENTATIVE MEASURES:

Personal Protective Equipment: Wear PVC or rubber gloves and eye goggles or shield. Also wear regular foot wear, but rubber boots when handling spills. When handling product, it is preferred that you wear a plastic jacket or apron. Have safetry shower and eye wash fountain available close by.

Enigeering Controls: General ventilation is adequate. Ventilate storage tank outside.

Leak and Spill Procedure:Leaking product may be transferred to clean plastic containers. Dilute small spills with water and add sodium sulfite or sodium metabisulfite and flush to sewer. For large spills contact CANUTEC and supplier.

Waste Disposal: In accordance with Federal, Provincial and local government requiarements.

Storage Requirements: Use polyethylene, polypropylene, FRP or PVC containers. Store product at -10 to 30°C and away from sunlight or heat.

Special Shipping Information: Material is TDG regulated, UN #1791, Class 8, Packing Group 111. Do not drop containers.

SECTION VIII - FIRST AID:

Eye: Immediately flush with water for 15 minutes. Call a physician.

Skin: Immediately flush with water. Call a physician if irritation develops.

Inhalation: If inhaled, remove to fresh air. If symptoms persist, call a physician.

Ingestion: Do not induce vomiting. Rinse mouth with water, then drink one glass of water. Call a physician immediately.

Never give anything by mouth if victim is unconscious or rapidly losing consciousness or is convulsing.

MATERIAL SAFETY DATA SHEET

OVADINE

Section I - IDENTIFICATION

PRODUCT: Ovadine

SYNONYMS: Povidone Iodine solution

Section II - HAZARDOUS INGREDIENTS

COMPOSITION	%	TLV	HAZARD
Povidone Iodine	10-12%	n. av.	none known

Section III - HEALTH & FIRST AID INFORMATION

INHALATION: There is no evidence of adverse effects from inhalation of povidone iodine solutions.

INGESTION: There is no evidence of adverse effects in rats that received up to 30 mg/kg/week for 12 weeks of 10% povidone iodine solutions. The possibility exists that in certain individuals povidone iodine solutions may cause diarrhea or intestinal problems.

EYE CONTACT: There is no evidence of eye irritation from contact with povidone iodine solutions. If contact does occur the eye should be flushed with water.

SKIN CONTACT: There is no evidence of skin irritation either for intact or abraded skin from contact with povidone Iodine solutions. If contact does occur the affected area should be flushed with water.

OTHER HEALTH INFORMATION: LD50 36.16 ml/kg orally in female and male rats. This is for 10% aqueous povidone iodine solutions with lower and upper limits of 29.13 ml/kg and 46.99 ml/kg. This compound is classified as practically non-toxic as a 10% aqueous solution.

SYNDEL LABORATORIES LTD
958 Chatsworth Road
Qualicum beach, BC V9K 1V5
Canada

Telephone: (250) 752-5256
(800) 663-2282
Fax: (250) 752-5188

Section IV - PHYSICAL DATA

SOLUBILITY IN WATER: completely miscible

APPEARANCE AND ODOUR: dark reddish brown liquid with slight iodine-like odour

pH: 6.5 - 7.5

SPECIFIC GRAVITY: 1.02 - 1.04

AVAILABLE IODINE: 0.97% - 1.07%

Section V - FIRE AND EXPLOSION HAZARDS

FLASH POINT & METHODS USED: none

FLAMMABLE LIMITS IN AIR; % BY VOL. LOWER: none

FLAMMABLE LIMITS IN AIR; % BY VOL. UPPER: none

SPECIAL FIRE FIGHTING PROCEDURES & PRECAUTIONS: none

UNUSUAL FIRE & EXPLOSION HAZARDS: none

Section VI - REACTIVITY

STABILITY: stable

HAZARDOUS POLYMERIZATION: will not occur

CONDITIONS & MATERIALS TO AVOID: heat causes decrease in available iodine

HAZARDOUS DECOMPOSITION PRODUCTS: may produce iodine vapours

Section VII - EMPLOYEE PROTECTION

CONTROL MEASURES: Iodine may be neutralized with sodium thiosulfate.

RESPIRATORY PROTECTION: Use with adequate ventilation.

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Fax: (250) 752-5188

PROTECTIVE CLOTHING: Wear gloves and protective clothing when using this product.

EYE PROTECTION: Wear eye protection when handling this product.

Section VIII - ENVIRONMENTAL PROTECTION

ENVIRONMENTAL PRECAUTIONS: Ensure that any leaks or spills are cleaned up.

SPILL OR LEAK PRECAUTIONS: Do not allow to flow into water supplies. Absorb any leaked material or neutralize with sodium thiosulfate.

WASTE DISPOSAL: May usually be disposed of in landfill. Seek the advice of a professional disposal service. Ensure disposal method complies with local, provincial and federal regulations governing disposal.

Section IX - REGULATORY CONTROLS

DEPT. OF TRANSPORTATION: Not regulated under the Transport of Dangerous Goods Act.

OTHER REGULATORY REQUIREMENT: none

Section X - PRECAUTIONS: HANDLING, STORAGE & USAGE

Store in a cool place away from direct light in a tightly closed container.

PREPARED BY: MSDS Dept . **DATE:** Update December 20, 2010

SYNDEL LABORATORIES LTD
958 Chatsworth Road
Qualicum beach, BC V9K 1V5
Canada

Telephone: (250) 752-5256
(800) 663-2282
Fax: (250) 752-5188

Material Safety Data Sheet

LA0548
Hydrogen Peroxide 35%

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA0548
Product Name: Hydrogen Peroxide 35%
Synonyms: None
Chemical Family: None Known
Application: Oxidizing agent. Bleach & water chemicals.

Distributed By:
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC
V6X 1W5

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.
Preparation date of MSDS: 07/Oct/2016
Telephone number of preparer: 1-866-686-4827

24-Hour Emergency Telephone Number (CANUTEC): (613) 996-6666

2. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: Corrosive. May cause conjunctivitis, corneal burns and permanent damage. Symptoms may occur with delay.
Skin Contact: Corrosive. May cause burns resulting in permanent damage. Prolonged exposure may cause severe irritation and white discoloration. Burning may result in localized erythema (redness) or even blistering of the skin.
Inhalation: Causes severe respiratory irritation. Vapors may cause pulmonary edema. Toxic effects may be delayed.
Ingestion: Ingestion of high concentrations causes rapid release of oxygen which may expand the esophagus or stomach resulting in severe damage (bleeding, ulceration or perforation). Expected to cause burns to the gastrointestinal tract. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Percentage (W/W)	LD50s and LC50s Route & Species:
Hydrogen Peroxide 7722-84-1	30-60	LD50 (oral, male rat): 1193 mg/kg (35% solution) ; LD50 (oral, female rat): 801 mg/kg (60% solution) ; LD50 (oral, male rat): 75 mg/kg (70% solution) ; LD50 (oral, mouse): 2000 mg/kg (90% solution) ; LD50 (dermal, rabbit): approximately 690 mg/kg (90% solution) ; LD50 (oral, rat): 805 mg/kg (70% solution) ; LC50 (inhalation, rat) ; >0.17mg/l/4h (50% solution) ; LD50 (dermal, rabbit) : > 6500 mg/kg (70% solution)

Note: No additional remark.

4. FIRST AID MEASURES

Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing. Have an ophthalmologist make an evaluation of eye injury.
Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.
Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.
Notes to Physician: Hydrogen peroxide at this concentration is a strong oxidant. Direct contact with the eye is likely to cause corneal damage especially if not washed immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Because of the likelihood of corrosive effects on the gastrointestinal tract after ingestion, and the unlikelihood of systemic effects, attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. There is a remote possibility, however, that a nasogastric or orogastric tube may be required for the reduction of severe distension due to gas formation.

5. FIRE FIGHTING MEASURES

Flash Point: None.
Flash Point Method: Not applicable.
Autoignition Temperature: Not available.
Flammable Limits in Air (%): Not Available.
Extinguishing Media: Do not use CO2 extinguisher on this material; use only water spray or appropriate foam. Do not use organic compounds on this material.
Special Exposure Hazards: Strong oxidizer. Contact with combustible materials may cause a fire. Release of oxygen may support combustion. Contact with incompatible materials (e.g. metals, alkalis and reducing agents) will cause hazardous decomposition resulting in the release of large quantities of heat, steam and oxygen gas. Exposure to heat may cause hazardous decomposition. A severe detonation hazard may exist when mixed with organic liquids, e.g. kerosene or gasoline. Isolate and restrict area access. Fight fire from a safe distance and from a protected location. Stay upwind. Stop leak only if safe to do so. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure build-up which could result in container rupture.
Hazardous Decomposition/Combustion Materials (under fire conditions): Oxygen. Steam.
Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.
NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 3 FLAMMABILITY 0 INSTABILITY 1 SPECIAL Oxidizer
HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 3, FLAMMABILITY 0, REACTIVITY 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.
Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed.
Procedure for Clean Up: Restrict access to unprotected personnel. Stop leak only if safe to do so. Small spills: Flush area with water. Large spills : Dike with earth, sand or inert sorbent material to contain spill. Remove liquid with compatible pumps or vacuum equipment. Place in suitable container for disposal. Flush area with water. Keep materials which can burn away from spilled materials. Spontaneous combustion hazard : - combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles, can cause the material to ignite and result in a fire.

7. HANDLING AND STORAGE

Handling: For food plant and other industrial use only. Handle and open containers with care. Never touch eyes of face with hands or gloves that may be contaminated with this product. Do not ingest. Avoid inhalation of chemical. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment.

7. HANDLING AND STORAGE

Storage: Do not store near combustible materials. Store in a cool, dry, well ventilated area. Keep containers tightly closed. Do not store this material in containers made of light metals. Recommended container materials: glass, polyvinyl chloride, polyethylene, ceramics, polypropylene. Use adequate venting devices on all packages, containers and tanks and check correct operation periodically. Do not confine product in unvented vessels or between closed valves. Risk of overpressure and bursting due to decomposition in confined spaces and pipes. Do not store on wooden floors or wooden pallets.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Use process enclosure, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH approved respirator. In case of spill or leak resulting in unknown concentration, use a NIOSH approved supplied air respirator.

Gloves:

Natural rubber gloves. Butyl rubber gloves. Nitrile gloves.

Skin Protection: Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Eyes: Chemical goggles; also wear a face shield if splashing hazard exists.

Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Ingredients	Exposure Limit - ACGIH	Exposure Limit - OSHA	Immediately Dangerous to Life or Health - IDLH
Hydrogen Peroxide	1 ppm TLV-TWA	1 ppm TWA 1.4 mg/m^3 TWA	75 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Color: Clear Colorless
Odor: Pungent
pH <2 (20°C)
Specific Gravity: 1.13
Boiling Point: 119°C /246.2°F
Freezing/Melting Point: -56°C / -68.8°F
Vapor Pressure: 48 Pa @ 30°C
Vapor Density: Not Available.
% Volatile by Volume: Not Available.
Evaporation Rate: Not Available.
Solubility: Completely miscible.
VOCs: Not Available.
Viscosity: 1.8 mPa.s @ 0°C
Molecular Weight: 34.02 g/Mol
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: High temperatures. Spontaneous combustion hazard : - Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood, or other combustibles, can cause the material to ignite and result in a fire.
Materials to Avoid: Metals. Reducing agents. Alkalis. Combustible material. Organic materials. Heavy metals and their salts.
Hazardous Decomposition Products: Steam. Oxygen.

10. STABILITY AND REACTIVITY

Additional Information:

No additional remark.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: Ingestion of high concentrations causes rapid release of oxygen which may expand the esophagus or stomach resulting in severe damage (bleeding, ulceration or perforation). Expected to cause burns to the gastrointestinal tract. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.
Skin Contact: Corrosive. May cause burns resulting in permanent damage. Prolonged exposure may cause severe irritation and white discoloration. Burning may result in localized erythema (redness) or even blistering of the skin.
Inhalation: Causes severe respiratory irritation. Vapors may cause pulmonary edema. Toxic effects may be delayed.
Eye Contact: Corrosive. May cause conjunctivitis, corneal burns and permanent damage. Symptoms may occur with delay.

Additional Information:
Acute Test of Product:
Acute Oral LD50: 805 mg/kg (rat)
Acute Dermal LD50: >6500 mg/kg (rabbit)
Acute Inhalation LC50: Not Available.

Carcinogenicity:

Ingredients	IARC - Carcinogens	ACGIH - Carcinogens
Hydrogen Peroxide	Group 3	A3

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity/ Teratogenicity/ Embryotoxicity/ Mutagenicity: It is not possible to conclude that hydrogen peroxide is mutagenic. Positive results have been obtained in cultured humans cells. Negative results have been obtained in relevant studies using live animals. Positive results have been obtained in short-term mutagenicity tests.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Ingredients	Ecotoxicity - Fish Species Data	Acute Crustaceans Toxicity:	Ecotoxicity - Freshwater Algae Data
Hydrogen Peroxide	LC50 (48 hr) carp: 42 mg/L. ; LC50 (96 hr) fish : 37.4 mg/l	EC50 (24 hr) Daphnia : 7.7 mg/l	NOEC (72 hr) Algae : 0.1 mg/l

Other Information:
Under ambient conditions quick hydrolysis, reduction or decomposition occurs. Hydrogen peroxide quickly decomposes to oxygen and water.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.
Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

DOT (U.S.):
DOT Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION
DOT Hazardous Class 5.1 (8)
DOT UN Number: UN2014
DOT Packing Group: II
DOT Reportable Quantity (lbs): Not Available.

14. TRANSPORT INFORMATION

Note: No additional remark.
Marine Pollutant: No.

TDG (Canada):
TDG Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Hazard Class: 5.1 (8)
UN Number: UN2014
Packing Group: II
Note: No additional remark.
Marine Pollutant: No.

15. REGULATORY INFORMATION

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

U.S. Regulatory Rules

Ingredients	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Hydrogen Peroxide	Listed	Not Listed.	Not Listed.

California Proposition 65: Not Listed.
MA Right to Know List: Listed.
New Jersey Right-to-Know List: Listed.
Pennsylvania Right to Know List: Listed.

Additional Notes: Not Available.

WHMIS Hazardous Class:
C OXIDIZING MATERIALS
D1B TOXIC MATERIALS
E CORROSIVE MATERIAL
F DANGEROUSLY REACTIVE MATERIAL

16. OTHER INFORMATION

Additional Information:

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer:

NOTICE TO READER:
Univar, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

*****END OF MSDS*****

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

PRODUCT NAME: LIQUID DYNEMATE PLUS

USE : Chlorinated alkaline cleaner

SUPPLIER'S NAME & ADDRESS :
WEST PENETONE INC.
10,900 SECANT ST.
ANJOU, QUEBEC, H1J 1S5

EMERGENCY TELEPHONE NUMBERS : **WEST PENETONE :** (514) 355-4660
CANUTEC : (613) 996-6666

SECTION 2: HAZARDS IDENTIFICATION

Corrosive to eyes and skin. Harmful if swallowed.

Inhalation of spray mist will irritate respiratory passages.

SECTION 3: COMPOSITION AND INFORMATION ON INGREDIENTS

	%	CAS # :	ACGIH TLV :	LD50 OF MATERIAL	LC50 OF MATERIAL
Potassium hydroxide	10-15	1310-58-3	2 mg/m^3	Rat-oral 365 mg/kg	Not applicable
Sodium hypochlorite	1-5	7681-52-9	None	Rat-oral 5.3 g/kg	Not applicable

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush with plenty of water for 15 minutes. Consult physician

SKIN CONTACT: Flush with plenty of water for 15 minutes. Consult physician if irritation develops or persists.

INHALATION: Give fresh air.

INGESTION: Do not induce vomiting. Drink plenty of water and contact physician immediately.

SECTION 5: FIRE FIGHTING MEASURES

MEANS OF EXTINCTION : Not applicable
HAZARDOUS COMBUSTION PRODUCTS : Not applicable

SPECIAL PRECAUTIONS FOR FIREFIGHTERS: Not applicable

SECTION 6: ACCIDENTAL RELEASE MEASURES

SPILL CONTROL MEASURES :
Use absorbent material or mop up. Rinse area with plenty of water.

SECTION7: HANDLING AND STORAGE

STORAGE AND HANDLING PROCEDURES :
Store away from acids. Keep from freezing.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS:
See Section 3
PERSONAL PROTECTION :
Rubber or neoprene gloves. Splash proof goggles or face shield, rubber apron and boots.
ENGINEERING CONTROLS :
No special measures required.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE :
Clear, light green liquid
ODOR
Faint chlorine
ODOR THRESHOLD :
Not applicable
pH :
> 13
FREEZING POINT :
Not available
BOILING POINT :
Approx. 100 ºC
FLASH POINT :
None
EVAPORATION RATE, water = 1 :
1
FLAMMABILITY (SOLID, GAS):
Not applicable
VAPOR PRESSURE, mm Hg AT 20ºC :
Not applicable
VAPOR DENSITY (Air = 1) :
Not applicable
SPECIFIC GRAVITY AT 20ºC:
1.25
SOLUBILITY IN WATER :
Complete
COEFFICIENT OF WATER/OIL DISTRIBUTION :
Not available
AUTO IGNITION TEMPERATURE :
None
DECOMPOSITION TEMPERATURE:
Not available
VISCOSITY:
Not available
FLAMMABLE LIMITS :
UPPER: Not applicable **LOWER :** Not applicable

SECTION 10: STABILITY AND REACTIVITY

CONDITIONS OF STABILITY :
Product is stable
INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID :
Acids
REACTIVITY :
Not reactive
HAZARDOUS DECOMPOSITION PRODUCTS :
None.
POSSIBILITY OF HAZARDOUS REACTIONS:
Chlorine gas when mixed with acids.

SECTION 11: TOXICOLOGICAL INFORMATION

ROUTE OF ENTRY:
Skin and eye contact (acute)
Ingestion
Inhalation
ACUTE HEALTH EFFECTS:
Severe irritation and/or burns to skin and eyes. Inhalation of spray mist will irritate respiratory passages. Ingestion will severely irritate gastro-intestinal tract.
EFFECTS OF CHRONIC EXPOSURE:
None known
EXPOSURE LIMITS AND TOXICITY:
See Section 3

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY: Not available

PERSISTENCE AND DEGRADABILITY: Not available

BIOACCUMULATIVE POTENTIAL: Not available

MOBILITY IN SOIL: Not available

OTHER ADVERSE EFFECTS: None known

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL :
Consult local and / or provincial authorities

SECTION 14: TRANSPORT INFORMATION

T.D.G. classification: corrosive liquid n.o.s. (potassium hydroxide), class 8, UN 1760, PG III

SECTION 15: REGULATORY INFORMATION

WHMIS classification: E
DSL compliant

SECTION 16: OTHER INFORMATION

PREPARED BY : PIERRE STEWART
MANAGER TECH. SERVICES
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DATE : March 3, 2014
VERSION: 9
SUPERCEDES: Version 8, June 30, 2012

APPENDIX E

Terrestrial Environment - Supporting Information

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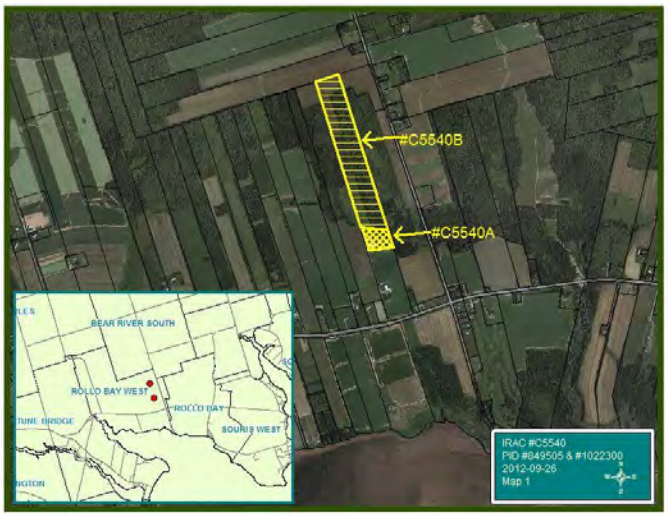
Prepared for: DE Jardine Consulting and Joose Environmental Consulting Inc.
Prepared by: Fiep de Bie, 34 Edgehill Terrace, Stratford, PE (March 2016).

Aqua Bounty purchase of Atlantic Sea Smolt Facility, 1300 Route 2, Rollo Bay West.
Re: Modifications and some new construction.



Aqua Bounty proposed construction site

Objectives:
Research the prevalence of wildlife and breeding status of avian species in the study area. Check for records of rare or endangered species (COSEWIC), records of nesting areas and special habitats.

Method used:
- Consulting the Maritime Breeding Bird Atlas 2006-2010.
- Consult with Maritime Breeding Bird Atlas surveyors on rare avian species observed in the survey square (20NS53).
- Obtain location of rare species in the Maritime Breeding Bird Atlas (Greg Campbell, Bird Studies Canada).
- Consult eBird for sightings in and near the Aqua Bounty site.
- Consult Nature PEI records and PEI birding list server.
- Consult Provincial Forest maps for habitat.

- Check Conservation data ranking and Species at Risk status - Atlantic Canada Conservation Data Centre.
- Consult and confirm COSEWIC website for Species at Risk status for avian species.
- Consult PEI "Field Checklist of Birds" (8th edition, 2014) for seasonal frequency of birds.

Results:
SRank of provincial birds: SRank denotes provincial status of birds by the Atlantic Canada Conservation Data Centre (ACCDC). Classification "S5" indicates an abundant species breeding in the province and "S4" refers to a fairly common species breeding in PEI. Classification "S3" refers to species breeding on PEI that are uncommon throughout its range in the province, "S2" are species breeding on PEI that are provincially rare, and "S1" are species breeding on PEI that are extremely rare in the province. The majority of species detected during the Maritime breeding bird Atlas surveys (2006-2010) were classified as S4 and/or S5 by the ACCDC, with the exception of seven avian species.

During the 2006-2010 Maritime Breeding Bird Survey, five "Sensitive", one "May be at Risk" and one "At risk" bird species were found within the 10 x 10 km survey square (20NS53), in which the Aqua Bounty site is located. Species with S1, S2 and S3 ranking found in the square are: Killdeer (S3B, Sensitive), Common Tern (S2B, May be at risk), Olive-sided Flycatcher (S3B At risk), Philadelphia Vireo (S1 S2B, Sensitive), Eastern Kingbird (S3B, Sensitive), Rose-breasted Grosbeak (S3B, Sensitive) and Bobolink (S3B, Sensitive). The status of the Olive-sided Flycatcher (*Contopus cooperi*) is threatened under COSEWIC. An Olive-sided Flycatcher was found in survey square during the Maritime Breeding Bird Atlas surveys, but not at the Aqua Bounty site. A Bobolink (threatened) was found in the square, but no location was found. There were two Barn swallow (threatened) records in 2008, and UTM coordinates for only one sighting (May 31, 2008). It was not found at the proposed construction site.

Field Checklist:
Seasonal frequency of birds in Prince Edward Island can be found in the "Field Checklist of Birds" (8th edition, 2014) produced by the Government of Prince Edward Island. Codes for seasonal frequency are (O) occasional; (R) rare; (H) hypothetical; (U) uncommon; (A) accidental; (IR) irregular; (FC) fairly common; (C) common; and (VC) very common. Most species found near or at this development, according to the Maritime Breeding Bird Atlas are very common (50 or more birds per day an observer may expect to see), common (10-49 birds per day) and fairly common (1-9 birds per day). A few birds, such as the Olive-sided Flycatcher are uncommon in the spring and autumn, and fairly common in the summer. A Philadelphia Vireo is considered rare at any season.

The Maritime Breeding Bird Atlas does not list any federal endangered Species at Risk (COSEWIC) for this particular atlas square. It would require a field visit to confirm these findings. With the resources and time available no federally listed species at risk were found at the proposed site.

Habitat:
Approximately 60% of the proposed 36.7 acre site is woodland and 40% field. Some areas are mixed hard and softwoods and some are softwood only. There is a black spruce plantation and a white spruce plantation at this site. Trees in the non-plantation forest (other than a fairly recent clear-cut) are 14-16 meters in height and considered young woods.
This habitat may support various common wildlife species such as Red squirrel, Raccoon, Snowshoe hare, Red fox and Coyote. It is advised to carry out construction before or after the avian breeding season (late April – mid-August). The stream on the property will attract wildlife species and it is advised to maintain and enhance a riparian zone to protect the stream and support a wildlife corridor.

Resources:
The Committee on the Status of Endangered Wildlife (COSEWIC).
http://www.cosewic.gc.ca/eng/sct6/index_e.cfm

Maritimes Breeding Bird Atlas
http://www.mba-aom.ca/

Atlantic Data Conservation Data Centre
http://www.accdc.com/index.html

Botanical Report, Aqua Bounty Site, Rollo Bay

I visited the Aqua Bounty site today on Property #s 849505 and 1022300 in Rollo Bay.

The dominant manmade features of the development currently on site are the building and associated outdoor fish tanks, including the tank shell portions to be assembled for new tanks. The stream is immediately adjacent to the footprint of the current and proposed fish rearing facility.

The vegetation on the Aqua Bounty site consists of some native species near or at the stream edge as well as a number of introduced or weedy species around the existing tanks and into the proposed expansion area.

The native species include Broad-leaved Cat-tail, Soft Rush, Speckled Alder, Red Raspberry, Larch, Wild Rose and grasses. Two Cedar bushes were obviously planted for ornamental purposes.

Non-native species include Evening Primrose, Queen Anne's-lace, asters, goldenrods, grasses, Common St. John's-wort, Tuffed Vetch, Yarrow, Common Plantain and Strawberry.

There are no rare, uncommon or floral species of special concern within or near the commercial operation expansion area on this property. It is primarily land which has been heavily disturbed by development and the invasion of weedy plants.

The woodland north of the stream consists of White Spruce and Balsam Fir with some Pussy-willow and Wild Rose on the edge. The woodland ground herbaceous plants include Wood Fern and other common plants. It appears that the proposed expansion of the Aqua Bounty operation will have no impact on the woodland as it will be located on the other side of the stream.

Diane Griffin
D. Griffin Consulting

March 16, 2016

APPENDIX F

Questions/Comments and Associated Answers/Responses from Public and Technical Review Committee