

2021

NSARB-2021-001

Nova Scotia Aquaculture Review Board

BETWEEN:

Kelly Cove Salmon Ltd.

APPLICANT

and-

Minister of Nova Scotia Department of Fisheries and Aquaculture

PARTY

and

Gregory Heming

INTERVENOR

**Affidavit of Dr. Anthony Snyder**

I affirm and give evidence as follows:

1. I am an Aquatic Animal Health Veterinarian with the Nova Scotia Department of Fisheries and Aquaculture (the Department). As part of this position, I am responsible for applying standard veterinary practice to aquatic animal populations cultured at aquaculture licensed sites in Nova Scotia, including the Provincial Hatcheries, primarily through aquatic animal health surveillance programs; as well as delivering regulatory oversight. This is part of the strategic direction of the Department to sustain and grow aquaculture in the province by providing aquaculturists with health assistance, and support. I started in this position in May of 2013. Attached to this Affidavit as **Exhibit A** is a copy of my resume.
2. I have personal knowledge of the evidence affirmed in this Affidavit except where otherwise stated to be based on information and belief.
3. I state, in this Affidavit, the source of any information that is not based on my own personal knowledge, and I state my belief of the source.

4. I was part of the Review Team that performed the technical evaluation of this boundary amendment application. As an Aquatic Animal Health veterinarian, my role on the Review Team was to review Kelly Cove's Development Plan and any accompanying information pertaining to the licence application. As an Aquatic Animal Health veterinarian, the content of the Application being reviewed, is considered from an aquatic animal health perspective, and if it aligns with culturing practices suitable in Nova Scotia.

#### Aquatic Animal Health

5. Increased aquaculture health policy development began in 2013 when an extensive review of aquaculture in Nova Scotia was initiated by the government. From this review and other strategic decisions, the government initiated amendments to the *Fisheries and Coastal Resources Act* and created new *Aquaculture License and Lease Regulations* and *Aquaculture Management Regulations*. Fish health is a major focus of the new regulations which were promulgated in October 2015.
6. Fish health surveillance of cultured fish is a focus of the Aquatic Animal Health Section of the Provincial Aquaculture Division. The Marine Finfish Provincial Surveillance Program ensures that marine aquaculture sites are being managed in a way that mitigates the presence and potential spread of disease. By monitoring fish health, proactive measures can be instituted if a disease were to arise, to help mitigate risks to other farmed fish.
7. The provincial aquatic animal health program includes the provision of laboratory services which includes both testing completed within our working space, and also testing sent to external labs for completion.
8. There are 5 full time members of the Aquatic Animal Health Section: A Chief Aquatic Animal Health Veterinarian, two Aquatic Animal Health Veterinarians, an Aquatic Animal Health Coordinator and an Aquatic Animal Health Biologist. The roles and responsibilities of the Veterinarians within the section include: farm management plan reviews and audits, ongoing fish health content assessments of the FMP, the provincial marine finfish health surveillance program, the Certificate of Health for Transfer program, lease and licencing application reviews, to name a few. Because of this work, and the previous role of providing clinical veterinary services to marine Atlantic salmon farms, I have familiarity with the Rattling Beach site.
9. The Province's Aquatic Animal Health Section is not the only source of monitoring in place regarding the health of fish. The Canadian Food Inspection Agency (CFIA) addresses aquatic animal diseases of finfish, mollusks and crustaceans through the National Aquatic Animal Health Program (NAAHP). Federally, there are extensive regulations to prevent fish disease and to react quickly to control outbreaks. The regulations also deal with fish movement to prevent disease spread into Canada, between provinces and within provinces. There are also obligations to report certain diseases in fish under these regulations.
10. Fisheries and Oceans Canada (DFO) through the National Code of Introduction and Transfers of Aquatic Organisms has oversight of the movement of fish via Nova Scotia's

Introduction and Transfers Committee. DFO Chairs the committee. The Department has members on the committee.

11. Veterinarians, Operators and their staff, and laboratory staff in Nova Scotia have a duty to report certain diseases in fish to the Department under the *Aquaculture Management Regulations*.

#### Section 3 Factors

12. The parts of the boundary amendment application that I evaluated are relevant to several of the factors listed in s. 3 of the *Aquaculture Lease and Licence Regulations*. This affidavit is organized by the s. 3 factor most relevant to the parts of the application that I evaluated.

#### Section 3(b): Contribution to Community and Provincial Economic Development

##### Production Plan

13. I evaluated a number of aspects of Kelly Cove's production plan from an aquatic animal health perspective.
14. Evaluation of the proposed species and strain was completed from an aquatic animal health perspective. All incoming populations to be considered for stocking at Nova Scotia Marine Aquaculture sites require an Introductions and Transfers Licence, through the Nova Scotia Introductions and Transfers Committee, as well as a Certificate of Health for Transfer from the Provincial Government's Aquatic Animal Health, Aquaculture Division. Historically, Kelly Cove has received the required licence and certificate prior to each stocking event.
15. The Saint John River strain of Atlantic salmon is considered a suitable species and the historical strain to be cultivated in Nova Scotia.
16. One of the aspects of the production plan I assessed was the stocking density proposed by Kelly Cove Salmon. Stocking density looks at the biomass of fish occupying a specific volume of water ( $\text{kgs}/\text{m}^3$ ). Biomass will vary with life stage, size, and species, as well as the cage size and shape. The regulated maximum stocking density for marine salmonids in Nova Scotia is  $25 \text{ kgs}/\text{m}^3$ .
17. The maximum stocking density proposed by Kelly Cove for this site is  $25 \text{ kgs}/\text{m}^3$ . This is a reasonable value for this site and is in line with the regulated maximum in Nova Scotia.
18. I also assessed the cage array and size of the cages and found them to be reasonable. From an aquatic animal health perspective, the proposed cultivation infrastructure has been successfully utilized at this farm and is common within the Nova Scotia marine salmonid aquaculture industry. The proposed cage array of 2x10 100m HDPE polar circles (20 in total), is reasonable infrastructure for this location. The site experiences good water flow and has been a productive site without known negative fish health impacts due to cage array and size of cages.

19. Another aspect of the Production Plan I evaluated is the 3 month fallow period proposed by Kelly Cove. A 3 month fallow period is in line with the minimum compliance requirement the Department mandates be included in an Operator's FMP. Nova Scotia's recommended fallowing practices are in line with known industry best practices. These practices include fallowing sites between production groups, and the intervention of a veterinarian that may extend fallow periods if the presence of pathogens and/or parasites warrant it, which is within the authority of the Provincial Chief Aquatic Animal Health Veterinarian.

### **Section 3(d): Oceanographic Environment**

20. A part of the technical evaluation of Kelly Cove's boundary amendment application, I also assessed the suitability of the oceanographic environment from a fish health perspective.
21. The waves present within the Annapolis Basin would presumably be less than in open water areas, such as the Bay of Fundy, as illustrated in the data provided by Kelly Cove. Historically, from a fish health perspective, this site has not knowingly been negatively impacted by wave height.
22. The water current data presented by Kelly Cove is acceptable for the culture method and what is known to be acceptable for Atlantic salmon. Water current data considered favourable for an aquaculture marine farm is variable and is based on factors of the site (ex. the size of the fish, species stocked). The range of safe current speeds for Atlantic salmon is variable but is typically based on the body length of the fish – a larger fish can tolerate greater current speeds. Current speeds can also help improve the quality of water by transporting dissolved oxygen, and ultimately improve rearing conditions for fish.
23. I also looked at the salinity of the water at the site. The salinity range provided by Kelly Cove, 3.09-3.29‰ (31-33 ppt) salinity, which are reasonable values for successfully culturing an anadromous fish such as Atlantic salmon, which spends its adult life in seawater and migrates to freshwater to spawn.
24. The mean water temperature data presented by Kelly Cove ranged from 0-16.6 degrees Celsius for the site. These temperatures are suitable for culturing Atlantic salmon.
25. High and low water temperatures can have negative impacts on fish health, but the risk can be mitigated. Kelly Cove has mitigatory husbandry protocols in place in the event of extreme temperatures, such as low water temperatures beyond the lethal temperature for Atlantic salmon (-0.75 °C) to reduce negative impacts to the fish. In the event the lower tolerable temperature threshold is reached, deep nets will allow fish to avoid the surface water layer which, in winter, tends to be colder than deeper water. Ceasing feeding during a potential cold-water period will prevent the fish from visiting the cooler upper layer of water, as well as limiting activity on the site, as to not disturb the fish so that they may come to the surface.
26. A minimum compliance requirement of all marine finfish Operators is to monitor the sea water temperature at least once daily. Kelly Cove has the ability to monitor the sea water temperature at the Rattling Beach site continuously in real time with specialized

temperature probes. Temperature monitoring and having set procedures to help reduce risk when temperature thresholds are reached, position the farmers to be able to mitigate potentially negative fish health impacts due to water temperature.

27. Another aspect of the oceanographic environment that I evaluated is the water depth. With enclosure net depths of 8 meters and culturing location total depths of ~11-18 meters at low water, and considering there have not been any known fish health issues associated with water exchanges, it is unlikely that water depth at this site will have an adverse effect on fish health.

**Section 3(h): The number and productivity of other aquaculture sites in the public waters surrounding the proposed aquacultural operation**

28. At the time that Kelly Cove submitted its application, it identified all known or proposed aquaculture sites in the area at the time. There are now an additional 4 issued shellfish experimental sites in the Annapolis Basin (AQ#5003, 5004, 5005, & 5006).

**Bio Security**

29. There are not multiple active finfish aquaculture operators in this water body requiring specific biosecurity protocols to mitigate inter-operator fish health risks.
30. Kelly Cove does detail the use of company-based biosecurity protocols relating to personnel and equipment movement from site to site and from shared public locations to the site. Kelly Cove describes that footbaths are to be used upon entering and exiting the site vessel. All equipment is disinfected prior to being introduced to the Rattling Beach site. Site crew are made aware of internal biosecurity protocols regarding staff and equipment movement from site to site and from public locations to the site.
31. Kelly Cove states that visitors to the Rattling Beach site are expected to follow basic biosecurity and health and safety rules. The Site Manager confirms with the Area Manager that a visitor(s) has approval to be on site if the Site was not previously informed. If a certain site has a fish health concern, visitors will not be allowed to visit the site – unless granted permission by Saltwater Management or the Fish Health Manager. All visitors must sign the logbook. Visitors must change their footwear prior to stepping on site, rubber boots will be provided from the office.
32. Kelly Cove indicates that it uses the Digby Town Wharf to access the shore. There are no other active finfish aquaculture companies sharing this infrastructure, however, the wharf is used by community fishing vessels and open to the public. It is noted that all Kelly Cove Salmon marine finfish sites have wharf usage biosecurity procedures that consider other users of the wharf. The procedures aim to mitigate biosecurity risk through the control of personnel, traffic, vehicles, biologics and equipment. Wharf usage biosecurity procedures provide staff with a table of acceptable cleaners and disinfectants, as well as the appropriate uses of each and the concentrations and contact times to utilize. Protocols describe how the movement of vehicles, people and equipment should occur prior to boarding vessels. Description of appropriate PPE and safety equipment is provided and biosecurity strategies of using gloves, footbaths, site specific equipment and cleaning and disinfecting

procedures. The use of activity logs, cleaning and disinfecting logs are records that contribute to the overall biosecurity protocols, giving the ability to perform tracing activities if they are ever warranted.

33. Kelly Cove has identified measures they have implemented to minimize risks relating to shared infrastructure within section 8.2 of their Development Plan. It was noted that risks are minimized by following good management biosecurity practices. Some examples include site specific wharf usage biosecurity procedures, disinfection of equipment prior to going on to site, prior approval of visitors by the Site Manager to ensure understanding of the site protocols, and the donning of site specific footwear and disinfection footbaths prior to boarding and exiting vessels. These measures are important to avoid outside contamination of the farmed animals. Any fomites (objects or materials that could carry a pathogen or parasite), as well as people, must be managed in such a way to reduce the risk to the farmed fish by observing the described biosecurity protocols.
34. The two operating finfish aquaculture sites in the water body are AQ#1039 and AQ#1040, which are both operated by Kelly Cove Salmon. These two farms institute an all-in all-out production strategy, and both farms are stocked and harvested in the same seasons, then observe the same fallow periods. These strategies are important components of responsible biosecurity to maintain fish health.

### **Section 3 (g) Sustainability of Wild Salmon**

#### **Certificate of Health for Transfer Program**

35. The Certificate of Health for Transfer program utilizes a Health Policy for the Transfer of Live Cultured Finfish in Atlantic Canada and certifies that cultured finfish from aquaculture facilities transferred between and within Atlantic Provinces have been tested, with satisfactory results, according to the requirements of the Policy. Nova Scotia also issues Certificates of Health for Transfer for live fish or eggs originating from outside of Atlantic Canada.
36. Health testing of fish populations, as well as the review of the test results by veterinarians prior to stocking a marine site, is a strategy to help support the success of the farm. It may also help mitigate health risks to wild populations.
37. The Health Policy for the Transfer of Live Cultured Finfish in Atlantic Canada addresses finfish health events, including pathogens of concern as it applies to cultured finfish. The Policy is not intended to achieve equivalency with current Federal programs.

#### **Health Surveillance Monitoring**

38. The marine finfish health surveillance monitoring is comprised of “Provincial Surveillance” visits and “clinical” visits to marine farms throughout the year. A clinical visit involves an initiation of fish monitoring protocols that are acted on by the site management and a veterinary service team. A Provincial Surveillance visit, though it includes fish monitoring by a veterinary service team, is an on-going process of regulated

health monitoring which is scheduled and meets the criteria of a pre-determined health monitoring program.

39. Surveillance and early detection are considered integral components for effective disease monitoring. To establish the pathogen status of a marine site, a marine aquaculture site must have a minimum of six Provincial Surveillance veterinary visits per calendar year (January to December). At least two of these visits will be performed by the Chief Aquatic Animal Health Veterinarian or Veterinary Designate from the Provincial Fish Health Service. The remaining four visits may be performed by a veterinary service other than the one provided by the Province. A Provincial Surveillance visit, on average, will occur every 6 weeks for each marine farm. To be considered a Provincial Surveillance visit (and one of the 6 mandatory annual visits), the visit must be performed no sooner than 4 weeks from the previous Provincial Surveillance visit, and no later than 8 weeks from the last visit.

#### Sea Lice

40. Sea lice management in the Nova Scotia marine aquaculture industry employs an integrated approach to management. This strategy has all producers in a region, under the direction of a site veterinarian, or Provincial Aquatic Animal Health veterinarians, use a multifactorial approach to combatting finfish pests. These factors include routine monitoring (regular, weekly counts and record keeping), surveillance (audits of counts and examining fish by staff at weekly mortality dives), fallowing, optimum stocking densities, year-class separation, good fish health management, biosecurity protocols, site separation, and if required, rotation of chemotherapeutants and coordination of treatments (treatments could include non-chemotherapeutants). The aquaculture licence holder must monitor sea lice levels weekly from April 1 to January 15. Monitoring is conducted by counting and staging sea lice parasites on the skin of fish. Counts may be suspended if temperatures are below 4°C. If climatic conditions preclude a lice count, this omission from the weekly counts must be recorded in the Sea Lice Summary Record. This record must be made within seven days from the date that the scheduled lice count was to be conducted.
41. Sea lice records must be maintained and made available electronically for review by the Chief Aquatic Animal Health Veterinarian within 7 days of data collection.
42. Nova Scotia has a history of low infections of *Lepeophtheirus salmonis*. Having low specific treatment thresholds is important so new significant infections may be quickly controlled. A treatment strategy must be provided by the licence holder and must include proposed lice levels at which treatments may commence. Reasons for choosing the treatment levels must be included in the procedures. The reasons for choosing the levels should include the factors that will influence treatment decisions, such as, water temperatures, fish size, time to harvest, product type and availability.
43. Only products approved by Health Canada can be used for the treatment of sea lice. Treatment products must be used according to product labels and following all health and safety requirements and all Federal and Provincial regulations. If bath treatments were to occur on site, they must be conducted in completely enclosed containment. Sea lice

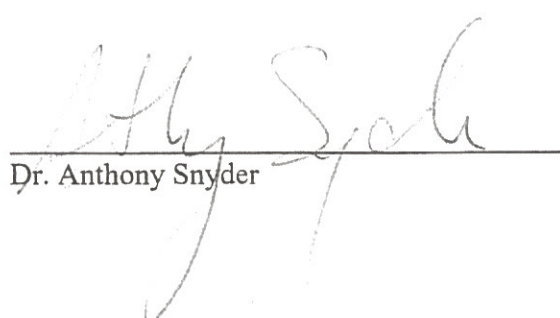
treatments, including both chemotherapeutant and alternative non-chemotherapeutants would be considered for use, depending on the situation and the most up to date information on the treatment efficacies, as these are always evolving/developing.

31. All Licence Holders have a regulatory responsibility to report elevated mortalities, suspect or known breach of containment, and pathogens of concern as outline in Section 21 of the *Aquaculture Management Regulations*.
44. I was not physically present before Ms. Campbell when I affirmed this affidavit. I was linked with Ms. Campbell using video conferencing technology.

Affirmed before me by videoconference  
from Wellington, NS (location of affiant)  
to Halifax, Nova Scotia (location of lawyer  
taking oath) on the 23<sup>rd</sup> day of April  
2021.



Alison Campbell  
Solicitor



Dr. Anthony Snyder

**ALISON CAMPBELL**  
A Commissioner of the Supreme  
Court of Nova Scotia



TAB

A

2021

NSARB-2021-001

This is Exhibit "A" referred to in the  
Affidavit of Dr. Anthony Snyder  
affirmed before me by videoconference  
on April 23<sup>rd</sup>, 2021

  
Signature

**ALISON CAMPBELL**  
A Commissioner of the Supreme  
Court of Nova Scotia

# ANTHONY D SNYDER, DVM BSc

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## EDUCATION

University of Prince Edward Island, Atlantic Veterinary College  
Charlottetown, PEI

**Doctor of Veterinary Medicine** 2006 – 2010

- AVC Dean's Honour list

Dalhousie University, Agricultural Campus (formerly the Nova Scotia Agriculture College)

**Bachelor of Science (Agriculture.) – Environmental Studies** 2000 – 2004; 2005-2006

- Dean's High Honour List

## AWARDS

Clinical Radiology Diagnostic Imaging Award 2009-2010  
Millennium Scholarship 2008-2009; 2009-2010  
VanToever Award in Aquaculture 2007-2008; 2008-2009  
NSAC Entrance Scholarship 2000-2004

## TEACHING EXPERIENCE

Dalhousie University, Agriculture Campus

**Guest Lecturer – Various fish health labs** 2013-Present

Memorial University, Marine Institute

**Lecturer – Post Graduate Fish Health Course** 2011-2013

## RELATED EXPERIENCE

Government of Nova Scotia, Dept. of Fisheries and Aquaculture  
Bible Hill, Nova Scotia

**Aquatic Animal Health Veterinarian** 2013-Present

- Clinical prescribing veterinarian; health and disease management for land-based finfish, and marine finfish/shellfish farms
- Perform biosecurity audits; farm management policy development, and training to government staff
- Employ Provincial fish health surveillance sampling and testing programs
- Regulatory oversight, assistance in policy development for Fisheries and Coastal Resources Act (Aquaculture Management Regulations)
- Emergency clinical veterinary care
- Liaison between Provincial and Federal Government Departments regarding Veterinary Health Polices, Surveillance and Transfer Testing Programs
- Managing staff of the Fish Health Section of the Aquaculture Division, as well as assisting the direction of the Section's activities
- Periodic responsibilities of the Provincial Chief Aquatic Animal Health Veterinarian (Acting Capacity)
- Performing necropsy/pathology reports, fish health summaries/certificates, and water chemistry investigations

Government of Newfoundland and Labrador, Dept. of Fisheries and Aquaculture  
St. John's, Newfoundland and Labrador

**Fish Health Veterinarian** 2011 – 2013

- Involved with biosecurity policy development and audits
- Clinical prescribing veterinarian, health and disease management for land-based finfish, and marine finfish/shellfish sites
- Employ Provincial fish health surveillance sampling and testing programs
- Emergency clinical veterinary care
- Lecturer for Marine Institute's Fish Health Program

Kennedy Animal Hospital  
Sydney River, Nova Scotia

**Associate Small Animal Veterinarian**

**2010 – 2011**

- Performed companion animal medicine and surgery (Routine and non-routine) duties
- Routinely examined small mammals and avian wildlife
- Worked with the local humane society for spay/neuters; and medical and surgical decisions impacting adoptability of animals
- Experienced with digital and traditional radiology, ultrasound and endoscopy
- Performed prophylactic dentistry's and extractions
- Worked with orthotics, casting, fittings and follow-ups
- Experience with shared on-call emergency duties

Nova Scotia Power Inc.  
Dartmouth, Nova Scotia

**Chemical Technician**

**2005-2006**

- Employed as a Chemical Technician while enrolled in the Chemical Technician Apprenticeship program
- Performed boiler water chemistry on main and auxiliary boilers
- Analyzed fuel oil chemistry
- Monitored environmental test wells
- Maintained and regenerated ion exchange water treatment trains and reverse osmosis units
- Assisted in management of wastewater treatment plant

Nova Scotia Power Inc.  
Lakeside, Nova Scotia

**Chemical Technician**

**2004-2005**

- Performed flu gas emissions monitoring at NSP generating stations
- Assisted with data and calculation analysis
- Assisted with environmental report generation.

**MEMBERSHIPS**

Member of the Canadian Veterinary Medical Association

Member of the Nova Scotia Veterinary Medical Association

- Council Member (2013 to 2017)
- Vice President (2017 to 2018)
- President (2018 to present)

Member of the Eastern Aquaculture Veterinary Association

- Secretary (2017 to present)

**ADDITIONAL TRAINING / CONFERENCES**

Animal Welfare in Practice Symposium - Animal Abuse and Neglect	2020
Eastern Aquaculture Veterinary Association CE Session	2020
OVMA Ornamental Fish Medicine	2020
World Aquaculture Veterinary Medical Association Conference, AGM, and Biosecurity Conference	2019
Nova Scotia Veterinary Medical Association Annual General Meeting	2018
<ul style="list-style-type: none"> <li>• Cannabis-How legalization will affect my practice of veterinary medicine</li> </ul>	2018
Nova Scotia Sea Farmers Conference	2018
Eastern Aquaculture Veterinary Association Fall Conference	2017
<ul style="list-style-type: none"> <li>• Antimicrobial use and legislative changes</li> <li>• General Overview of Aquaculture Welfare topics</li> <li>• FISHWELL Project Overview</li> </ul>	2017
Aqua Nor 2017 Forum and Tradeshow	2017
NSVMA Annual General Meeting	2017
<ul style="list-style-type: none"> <li>• More effective communication with clients as a way to improve compliance and relations</li> </ul>	2017
Aquaculture Canada and Sea Farmers Tradeshow and Conference	2017
Eastern Aquaculture Veterinary Association Spring Conference	2017
NSVMA Conference	2016
<ul style="list-style-type: none"> <li>• Antimicrobial Resistance Training</li> </ul>	2016
Aquaculture Association of Canada Conference	2016
CVMA Emerging Leaders Training Program	2016
Canadian Veterinary Medical Association Conference	2016

Level 2 – Sea Lice Training	2016
Records Management Training	2016
Standard First Aid AED CPR “A”	2015
International Aquaculture Conference on Members of the Genus Flavobacterium	2015
Nova Scotia Sea Farmers Conference	2014
• Aquatic invasive species and disease workshop	
Atlantic Canadian Fish Farmers Association Conference	2014
• Viral Management/Emergency Preparedness workshop	
Sea lice identification/counting training	2014
Small Non-Pleasure Vessel Basic Safety (MED A3)	2014
Eastern Aquaculture Veterinary Association Conference	2013
• Amoeboid gill disease & sea lice bath treatments	
NSVMA conference – Professional Support Program	2013
Introduction to OHS	2013
Pesticide Applicators Training (Sea Lice Treatments)	2012
Advanced Aquatic Animal Care and Husbandry Course	2012
Health and Husbandry of Aquatic Laboratory Animals	2012
Animal Use and Care training (CCAC)	2012
TRIM End User	2012
Mollusc Health and Disease Management Course	2011
Conflict resolution training	2011
NALVMA Veterinary Conference	2011
Aqua Nor 2011 Forum and Biosecurity Conference	2011