NOVA SCOTIA

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Received Via Email May 14, 2024

Aquaculture Licence/Lease Application

Applicant Information:

Applicant: Bear River First Nation Contact Person: Carol Ann Potter

Nova Scotia Registry of Joint Stocks Number: N/A

Revenue Canada Business Number: [redacted]

Telephone No. (Work): 902-308-0556 (Home): _____ (Cell): [redacted]

Fax No.: 902-467-4143 E-mail: carolannpotter@bearriverfirstnation.ca

Mailing Address: _____

P.O Box 210 , Bear River , Nova Scotia Postal Code: B0S 1B0

Civic Address: 48 Reservation Rd

_____ Postal Code: B0S 1B0

Proposed Site Information:

Location of Site: Annapolis Basin County: Digby/Annapolis Site Size (Ha): 15 Hectares

Site Dimensions: 411m x 367m

Hydrographic Chart No.: _____

Approximate Center Coordinates: Latitude: 44' 38.961' N

Longitude: 65' 41.389' W

Type of Licence Application

(Check appropriate boxes):

☐ Commercial licence/lease

☑ Experimental licence/lease

☐ Marine Plants ☐ Finfish ☑ Shellfish ☐ Other

Submit completed applications to:

Nova Scotia Department of Fisheries and Aquaculture, Aquaculture Division
1575 Lake Road, Shelburne, NS B0T 1W0
E-mail: aquaculture@novascotia.ca

Ver. 170723

☐ Land-based
- ☐ Freshwater
- ☐ Saltwater

- ☐ U-Fish
- ☐ Hatchery
- ☐ Nursery Facility
- ☐ Growout

☐ Marine
- ☑ Cage culture
- ☐ Suspended shellfish or marine plants
- ☐ Bottom shellfish with gear
- ☐ Bottom shellfish without gear

Application Materials

A complete application includes the following:

- Application fee (payable to Minister of Finance) according to Section 77 of the Aquaculture Licence and Lease Regulations for Nova Scotia made under Section 64, Chapter 25 of the Acts of 1996, *the Fisheries and Coastal Resources Act*
- Application Form
- Development Plan according to application
- Report on Public Engagement during Scoping (for all Marine applications and for other applications, as applicable)
- Copy of up-to-date Shareholder's Register which sets out the shareholdings of the company (if applicable, and if not already provided during the Option to Lease application process.

Public Notice and Disclosure

As part of the process for deciding on an aquaculture application, the Nova Scotia Department of Fisheries and Aquaculture ("Fisheries and Aquaculture") will disclose application information to other government bodies, including, if applicable, the Nova Scotia Aquaculture Review Board for use at an adjudicative hearing relating to the application.

In accordance with departmental policy, which seeks to promote public involvement in the process for deciding on aquaculture applications, Fisheries and Aquaculture may disclose application information – not including, however, personal or business confidential information – on the departmental website.

Privacy Statement

The personal and business confidential information collected as part of an aquaculture application will only be used or disclosed by Fisheries and Aquaculture for the purpose of deciding on the application.

All application information collected is subject to the Freedom of Information and Protection of Privacy Act ("FOIPOP") and will only be used or disclosed in accordance with FOIPOP.

By signing and submitting this form, I acknowledge that I have read, understand, and accept the above statements regarding the collection, use, and disclosure of the information provided on this form.

Signature of Applicant

[redacted]

Date

May 9th, 2024

Signature of Nova Scotia Department of Fisheries and Aquaculture Designate

[redacted]

Date

May 14, 2024

Submit completed applications to:

Nova Scotia Department of Fisheries and Aquaculture, Aquaculture Division
1575 Lake Road, Shelburne, NS B0T 1W0
E-mail: aquaculture@novascotia.ca

Received September 2, 2025

[redacted]

Experimental Marine Aquaculture Development Plan – Bear River First Nation

SECTION 1: THE OPTIMUM USE OF MARINE RESOURCES

This new experimental lease / license application builds off the work conducted by Bear River First Nation (BRFN) in 5003 - 5006. Through the work conducted to date, BRFN has developed a suitable anchor and mooring system that accommodates for the 7m tidal fluctuation in the Basin, is able to withstand the high energy environment and; has demonstrated that oysters are able to survive and grow within industry standards while stocked at industry standard densities.

Through the above work it was also discovered that in the new catenary mooring system design that was developed requires more water depth than anticipated. To perform while allowing suitable depth for over-wintering of cages, a minimum depth of 5-6m on low tide is required. This depth requirement is much greater than that needed for oyster producers in areas with lesser tidal fluctuations. This finding meant that the original experimental leases are incompatible for commercialization due to lack of consistent 5-6m depth.

As such, BRFN is applying for an experimental lease in a new area slightly west of 5006 which has been scoped by DSA Ocean and considered to have suitable depth throughout the proposed experimental lease area. This area also makes up a portion of BRFN's planned Option to Lease application.

The main goals of the experimentation to be conducted in this proposed area are:

- Deploy and test a new grid system developed by DSA Ocean. The catenary system developed by DSA Ocean works well but would be capital intensive to scale up. Furthermore, although the system performs well, it is challenging to achieve workable tensions in the main line at high tide. Typically, at high tide, the main line is so taught that it makes working the cages safely impossible. By deploying a grid design (similar to that used by finfish operations), capital cost of scale up will be reduced and the vast amount of tension will be taken off the main line (instead transferred to the grid). A new grid design has been developed by DSA Ocean and one of the primary goals of this new experimental work will be to test it to determine how it performs and how effectively it can be worked.
- A maximum of three elastomer systems will be evaluated. These elastomer systems will be identified through an evaluation of various suppliers with the goal being to choose systems that mitigate risk of electrolysis and perform well in our environment.
- Performance of the grid will be assessed with main metrics being ability to work the cages (on all tides), durability, anchor holding performance and overall performance of the system.
- Oyster growth and survival will be monitored at various densities and in submerged vs at surface deployment.

The end goals of this work are to ensure the new (deeper) site will be able to produce harvest ready oysters in an economically feasible time frame at industry standard survival rates, the new grid design will perform as expected, explore various stocking densities and holding states and to identify an anchoring / mooring system that performs well, demonstrates good robustness and mitigates risk of electrolysis.

SECTION 2: THE CONTRIBUTION OF THE PROPOSED OPERATION TO COMMUNITY AND PROVINCIAL ECONOMIC DEVELOPMENT

2.1a Experimental stocking plan

The plan will involve stocking up to three grids with the final number being dictated by research findings regarding the various commercial elastomer options.

	Oyster Entry Each Year		
Grid #	First Year Oysters	2-3 Year Old Oysters	Totals
1	7,500 – 22,500	7,500 – 22,500	15,000 – 45,000
2	7,500 – 22,500	7,500 – 22,500	15,000 – 45,000
3	7,500 – 22,500	7,500 – 22,500	15,000 – 45,000

The experimental process will follow the oysters from entry all the way through to harvest with the goal being to observe growth over time and, most importantly, to determine how long it takes to get to harvest.

Non experimental oysters will be held at standard, commercial scale density for oysters in the size range we will be working with (ie. 250 pcs / bag). The experimental oysters will be held at varying densities from 250 up to 500 pcs / bag.

- 10 - 30 cages per grid (1-3 lines per grid.
- 6 bags per cage.
- 250 pcs per bag with exception of the experimental bags which will be stocked at higher densities (see experimental plan).

The details of the experimental plan can be found in the Experimental Plan (Appendix A). Final number of cages / lines will be determined based on availability of oysters in the desired size ranges and ability to transfer them to our site.

2.1b Experimental Plans – Alternative Infrastructure and Species

Section 2.1a above outlines the main species (American oyster) and infrastructure (on surface and submerged cages with bags, chain / elastomer moorings) to be explored in this work. However, at the same time and at smaller scale, other species and infrastructure may also be explored as follows:

Alternative Shellfish Species:

The main species involved in this work will be the American oyster. However, at the same time and at a small scale, three other species may also be explored, namely the blue mussel, sea scallop and the European oyster. These species have demonstrated good growth potential in these waters in the past and as such, BRFN would like to test the growth and survival of these species.

Seaweed:

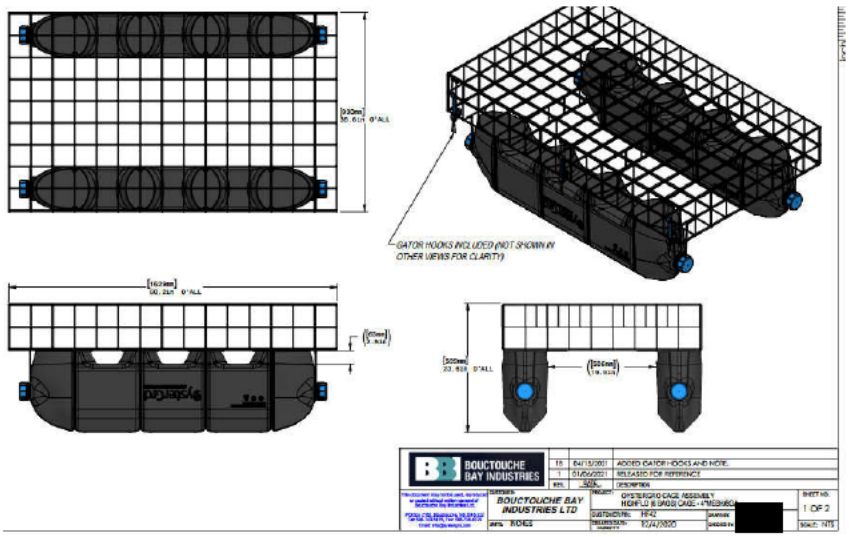
Some lines may be deployed with Saccharina latissimi (sugar kelp), Laminaria digitata and / or Alaria esculenta. BRFN recognizes that there is an opportunity for seaweed culture but there is a lack of processing capacity and knowledge of markets currently. However, as these deficiencies are resolved, seaweed culture could become a "shoulder crop" that could be planted in the fall (when the oyster season is over) and harvested in spring (before the oyster season begins) making seaweed culture a way to maximize production out of a lease. In preparation for the coming of seaweed culture, BRFN would like to start experimenting with the production of these species listed here including the evaluation of different off bottom culture methods.

Infrastructure:

The main infrastructural components include Oystergro cages, submerged grid systems, perimeter bouys and corner spars. Further details are as follows:

Bouctouche Bay Industries, Oyster Grow Cages

Dimensions and a picture of the cages are shown below:



Grids

The main component of the grids are the elastomer moorings and the steel screw anchors. The elastomer moorings and screw anchors are described below while a general layout of the grid system including location are shown in Appendix C.

Elastomers:

There will be a total of 8 elastomers per test grid.
Each elastomer measures 10m in length (unstretched) and approximately 12cm in diameter.

Screw Anchors:

- Each anchor is composed of a 1-1/2” square shaft hot dipped galvanized with 8”/10”/12” triple disc anchor (lead section).
- The lead section is 5’ long and each extension is 7’ long providing a total anchor length of 22’.

Perimeter Bouys and Spars

These will be dictated by Transport Canada but it is anticipated perimeter bouys will be 16” diameter, yellow and corner spars will be 5ft -5” spar bouys on the corners.

2.2 Potential economic impact

The potential economic benefits to Bear River, the surrounding communities and the Provincial government are considerable. For example, every 40 acres generates approximately $1 million in GDP and would provide approximately 6 full time equivalent jobs.
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Furthermore, for every $1 dollar in aquaculture sales, another $1.47 in sales is generated elsewhere in the economy (Aboriginal Aquaculture in Canada Initiative – National Socio-Economic Analysis Report, Gardner Pinfold, 2016).

This has been demonstrated in real time by the economic impact that the current exploratory work has had on Atlantic Canadian businesses such as the Digby Harbour Authority, DSA Ocean, Fabtech, Bouctouche Bay Industies, Rainbow Net and Rigging, Digby Salvage, Spec Resources, Huntley Marine, Hines Marine, Digby Marine Supply, DSA Ocean, Seaforth Geosurveys, Oceanside Equipment and Enterprise Shippagan.

2.3 Adverse economic impacts

Bear River does not anticipate any negative economic impacts from this project or any subsequent commercialization. Shellfish aquaculture is widely recognized as one of the least impactful forms of aquaculture.

Additionally, considerable effort has been done and continues to be done to evaluate methods that minimize impacts. Efforts to date include careful scoping to ensure sites are not located in areas that might impact recreation or commercial fishing activity and R&D to develop the least environmentally impactful anchoring and mooring system (ie. screw anchors and elastomer moorings).

SECTON 3: FISHERIES ACTIVITIES IN THE PUBLIC WATERS SURROUNDING THE PROPOSED AQUACULTURAL OPERATION

3.1 Status of fisheries activities

The main fisheries in both bays are deemed to be lobster and soft shell clams. When the site was chosen, these two fisheries were taken into consideration. Given that the lease would be located in subtidal waters, they are deemed to be a non-issue for intertidal clam fishers. Using its intimate knowledge of the lobster fishery, Bear River was careful to choose a location that should not conflict with traditional lobster trawl activity.

Both the Bear River and the Shubenacadie Bands have food fisheries in the bays. Again, the site was chosen in an effort to minimize impact to this fishery.

Fishery activity is shown in Appendix B.

3.2 Impacts on fisheries activities

During the process of developing this project, Bear River collaborated with the Province's Fisheries and Aquaculture Department as well as its own internal resources (ie. local fishers and fisheries management) to ensure that the proposed location minimizes impact to existing users.

Additionally, the Band is readily open to addressing any concerns that may be posed by users as the goal of this effort is to develop an industry that coexists and compliments other activities in the area.

SECTION 4: OCEANOGRAPHIC AND BIOPHYSICAL CHARACTERISTICS OF THE PUBLIC WATERS

4.1 Oceanographic environment

In support of Bear River First Nation's on-going work assessing oyster aquaculture in the Basin, DSA was commissioned to develop a report of expected wind, wave and current activity in the area. This data was used by DSA to design the mooring, anchor and main line systems for the experimental sites from 5003 – 5008.

Current conditions are typically determined by ADCP data collected at a site. As ADCP data has not yet been collected for this location, model data from an Acadia University FVCom model of the Bay of Fundy was processed to determine the maximum expected annual currents at the site. An ADCP was deployed by CMAR and NSDFA in December of 2020 in aquaculture lease 1042, which borders on this proposed site. This data is also included in this application.

Wave data is based on estimates produced by DSA for lease 5006 which is approximately 5km from the center of this proposed lease (center to center). For the Annapolis Basin area, STWave was used to model the nearshore conditions. In this application, wave, wind, and current conditions are represented using data developed by DSA for lease 5006. Given the close proximity of 5006 to this proposed site, values are anticipated to be highly representative.

Table 1 – Anticipated wind and wave activity for experimental lease

Wave/Wind conditions	Direction [from] [°]		Wind (m/s)	Hs (m)	Tp (s)
10yr wave/wind	*0*	N	20.06	0.52	2.1
	23	NNE	20.19	0.44	2.28
	45	NE	20.75	0.7	2.9
	68	ENE	20.16	0.78	2.7
	90	E	19.41	0.73	2.58
	113	ESE	18.19	0.41	2.16
	135	SE	18.65	0.52	2.67
	158	SSE	19.32	0.63	2.52
	180	S	19.81	0.72	2.52
	203	SSW	18.23	0.62	2.7
	225	SW	18.61	0.84	3.28
	248	WSW	18.42	0.93	3.1
	270	W	19.37	0.83	3
	293	WNW	20.09	0.38	2.42
	315	NW	19.83	0.46	2.27
	338	NNW	18.89	0.47	2.1

50yr wave/wind	*0*	N	24.42	0.65	2.3
	23	NNE	24.39	0.55	2.5
	45	NE	25.6	0.9	3.16
	68	ENE	25.4	1	2.96
	90	E	24.22	0.94	2.84
	113	ESE	22.21	0.53	2.36
	135	SE	22.81	0.66	2.92
	158	SSE	23.45	0.78	2.74
	180	S	24.02	0.91	2.74
	203	SSW	21.47	0.75	2.91
	225	SW	22.26	1	3.54
	248	WSW	21.97	1.1	3.3
	270	W	23.33	1	3.25
	293	WNW	24.17	0.47	2.65
	315	NW	24.1	0.57	2.5
	338	NNW	23.02	0.58	2.26

It should be noted that the return periods indicated for each wave parameter in Table 1 are representative of the boundary condition used by DSA to derive that value, not the value itself. Polar plots for maximum wave heights are presented in Figure 1 and Figure 2.

Figure 1 – Wave height, 10 year maximum

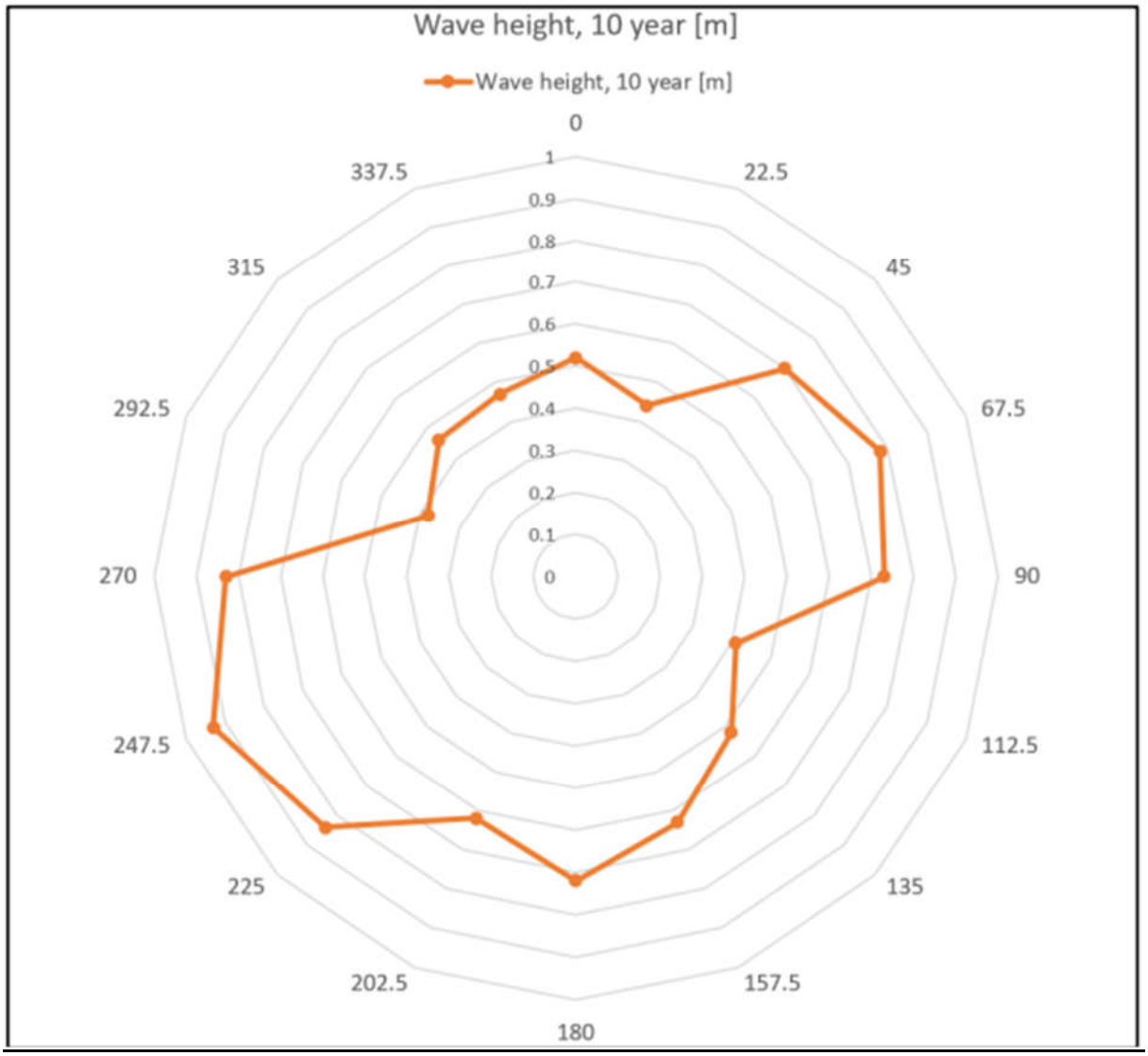
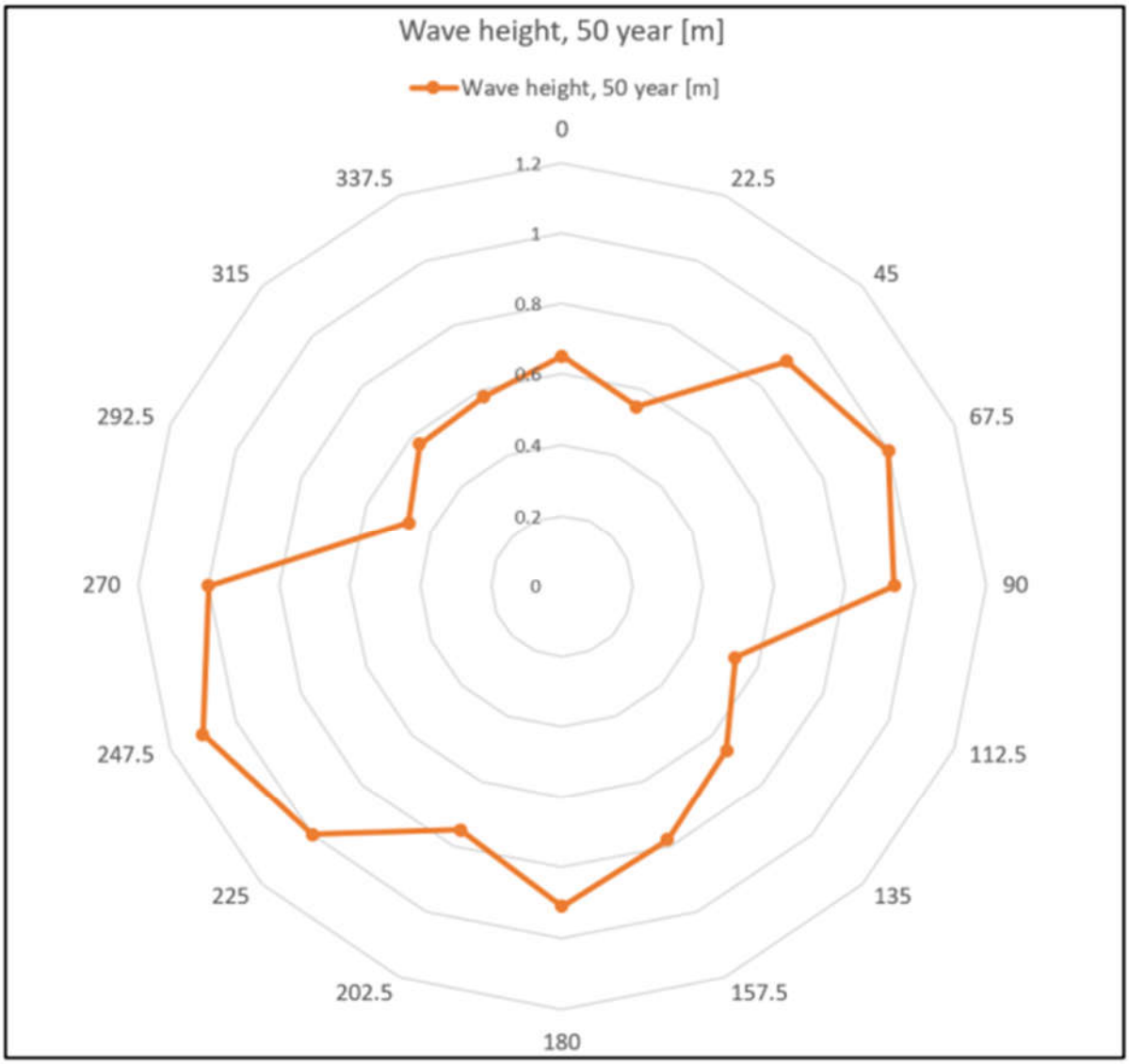


Figure 2 – Wave height, 50 year maximum



Annual Minimum Tide

Approximate low water, corner lease coordinates and center lease coordinates can be seen in Appendix C (sheet 1 of 4).

Annual Maximum Tide

The largest known tidal range at Digby is 9.30m or 30.5 feet.
Source: https://www.tide-forecast.com/locations/Digby-Nova-Scotia/tides/latest.

Current Speed Range and Averages

The maximum current speeds from the flow model, for Marine Shellfish Lease 5006 is summarized in Table 3. These represent the extreme current conditions at the center of the fish-farm (44° 40.131'N, 65° 39.736'W). The scatter plots for Current speed Vs direction for 5m and 10 m water depths are shown in Figure 3 and Figure 4. Based on these scatter plots, the dominant current directions for flood and ebb were 68° and 250°, respectively.

These current speeds and directions are expected to be very similar for this new lease application given the close proximity to 5006. However, one action to be carried out this year will be to launch an ADCP sensor to the site to confirm these assumptions.

Table 3 – Anticipated current conditions for the lease in this application based on analysis of 5006

Current conditions	Heading [To] [°]		Water depth	
			5 m	10 m
Maximum current speeds (m/s)	*0*	N	0.04	0.03
	23	NNE	0.05	0.04
	45	NE	0.14	0.1
	68	ENE	0.62	0.37
	90	E	0	0.21
	113	ESE	0	0
	135	SE	0	0
	158	SSE	0	0
	180	S	0	0
	203	SSW	0	0
	225	SW	0	0.01
	248	WSW	0.5	0.32
	270	W	0.55	0.32
	293	WNW	0.1	0.06
	315	NW	0.04	0.03
	338	NNW	0.03	0.03

Figure 3 – Anticipated current speed versus direction for site at 5m using data from 5006

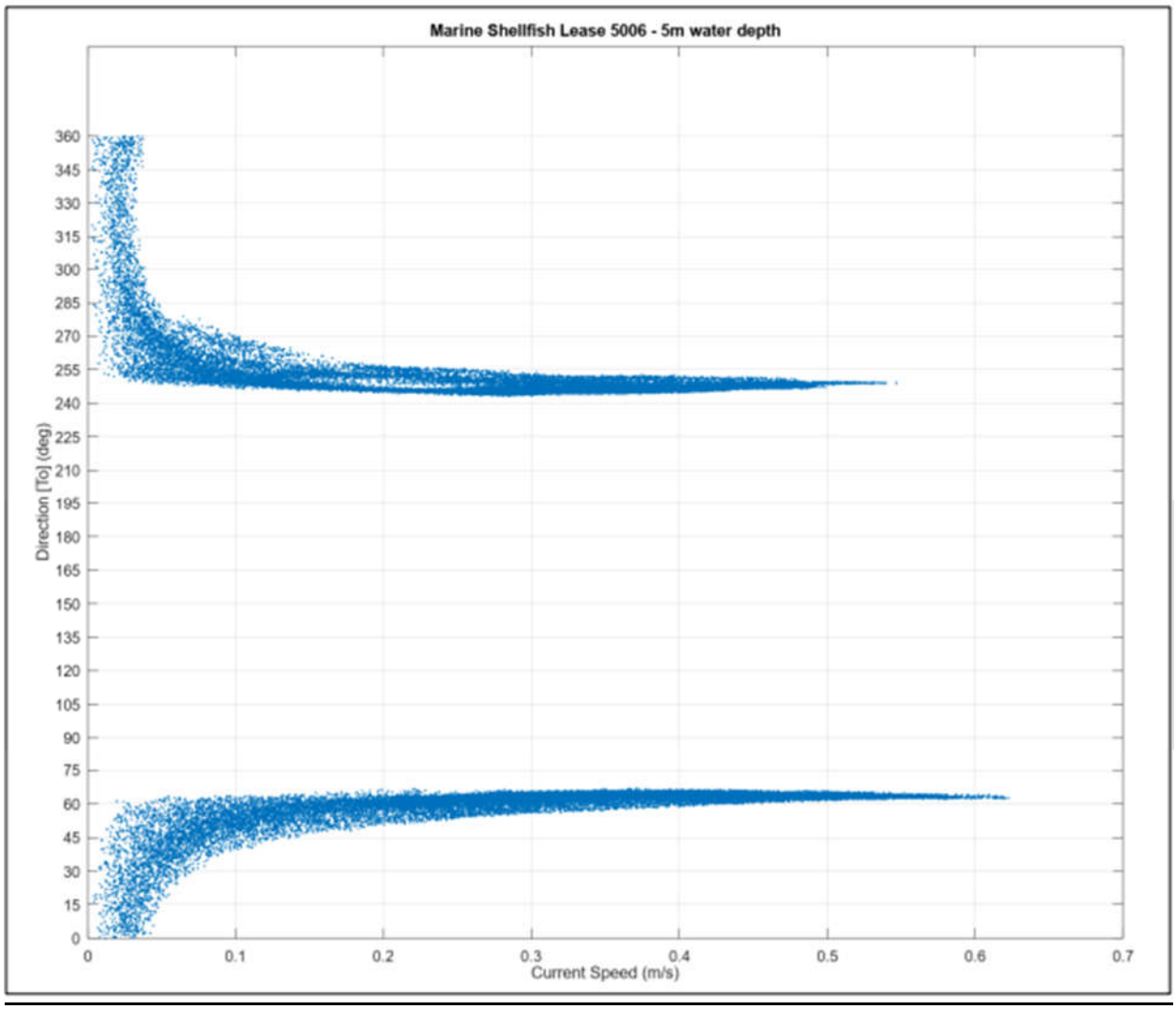
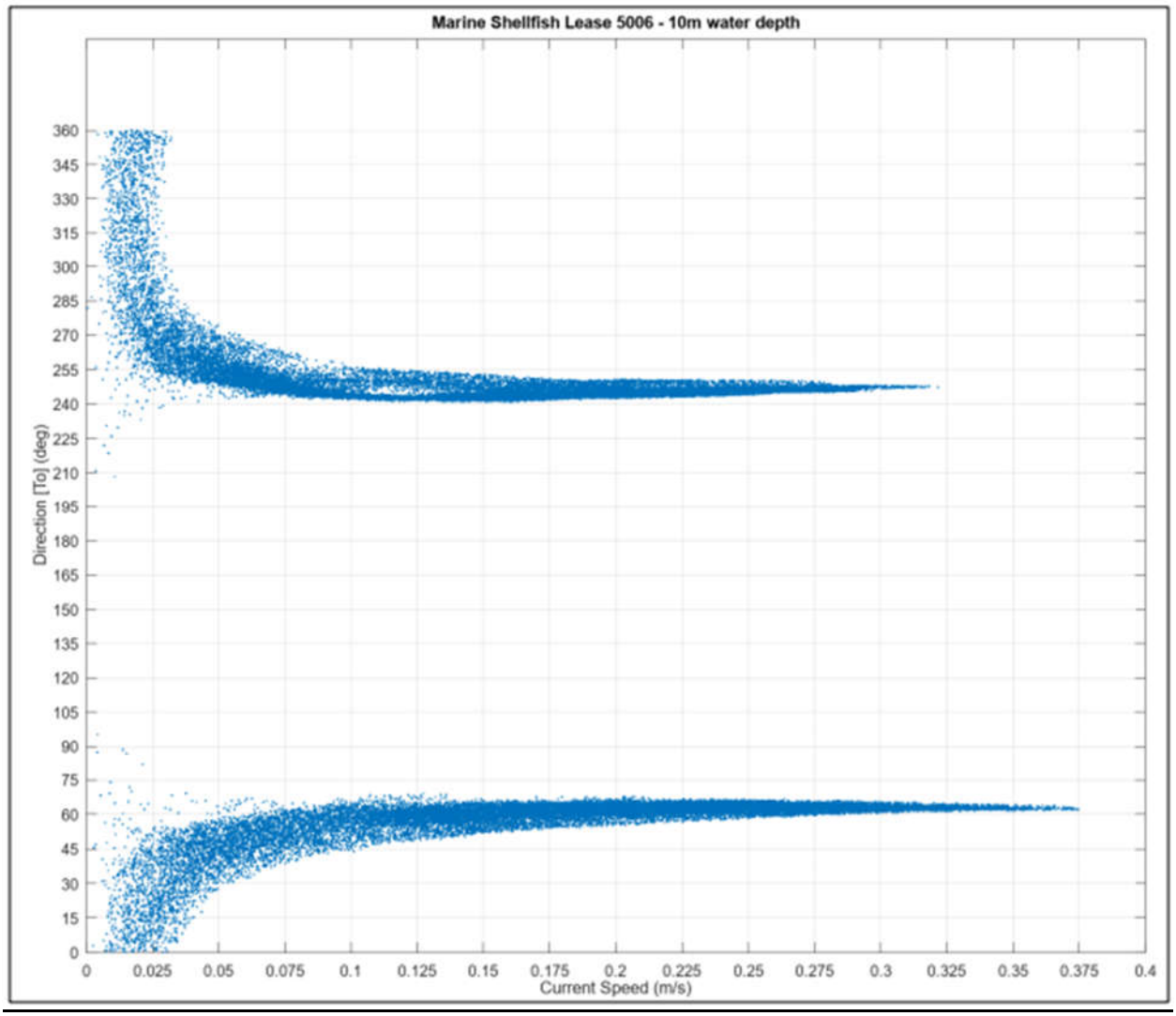


Figure 4 – Anticipated current speed versus direction for site at 10m using data from 5006



Annual Average, Minimum and Maximum Salinity

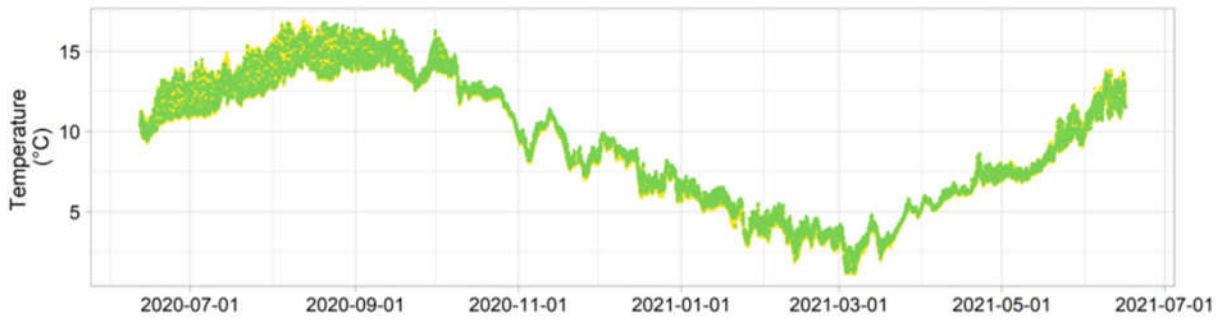
Using an amalgamation of salinity data gathered across sites 5003, 5005 and 1042 for the period from May 14 – June 18, 2021 and collated by CMAR, average salinity across these areas was found to be 32 ppt with a minimum of 28 and a maximum of 32 observed. It is anticipated that the lease in this application will display a similar salinity range. This salinity range is considered optimal for oyster growth and survival.

Annual Min / Max Sea Surface Temperature

Data gathered for sites 5005, 5006 and 1042 and collated by CMAR under the report Water Quality Report: Annapolis County, have been used to estimate sea surface temperatures at this proposed lease location.

From the CMAR report, sea surface temperatures were found to range from a high of approximately 17C in late summer to a low of approximately 1-2C by late winter / early spring.

Figure 5 – Sea Surface Temperatures for 5006



Depth of Water at Each Corner of Site

This data can be seen in Appendix C (sheet 1 of 4).

Current Location Classification

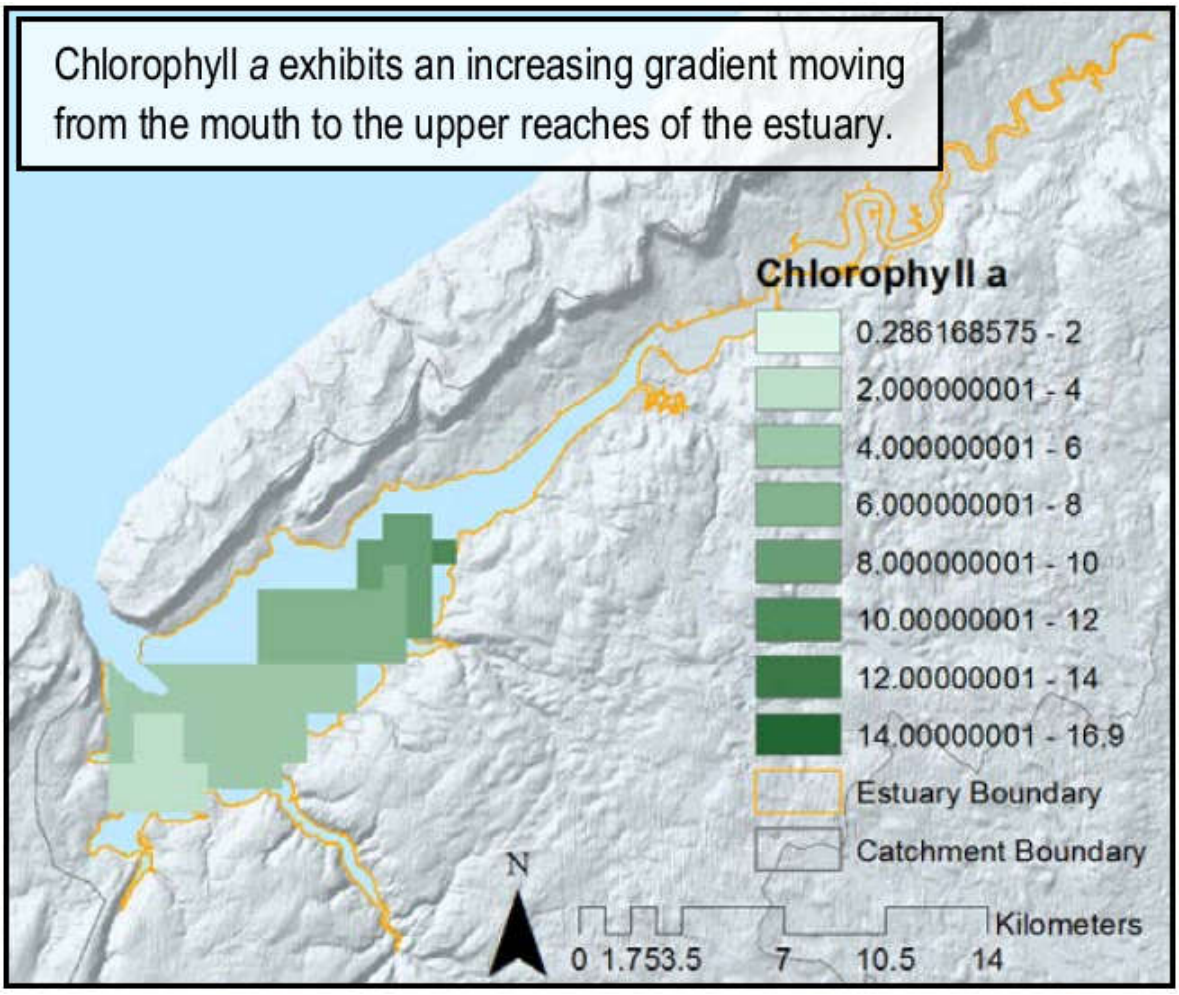
The site was cross referenced against the CSSP online map and deemed to be within approved waters.

Primary Production Information

There is limited primary production data for this area. However, in discussions with a past mussel farmer in the area ([redacted]), it was suggested that growth rates of his mussels was far superior to what he would typically observe in PEI waters indicating a good food source is available.

Bear River First Nation will be launching chlorophyl a sensors in the area in an effort to gather surrogate information regarding site carrying capacity.

Some chlorophyll data found for the Annapolis Basin Is shown below.



Source:
Fisheries and Oceans Canada – Census of Marine Life Biodiversity Analysis Layer (published: 2010)

Biotoxin Information

No information exists.

4.2 Baseline environmental monitoring

The site in this experimental application falls directly in the center of a commercial application (option to lease) that will also be submitted by Bear River First Nation in the near future. A camera survey of the proposed experimental lease has been completed and data sent to the Province.

4.3 Site design

The site was chosen through discussions with the Province in an attempt to choose a location that minimized conflicts with existing fisheries and recreational users yet afforded suitable water depths (5m+).

A site plan for the system is shown in Appendix C (sheets 1,3 and 4). This design was developed by DSA Engineering to ensure that the anchors, mooring, grid and main lines meet NS9415 standards, and industry practice within the region.
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SECTION 5: THE OTHER USERS OF THE PUBLIC WATERS SURROUNDING THE PROPOSED AQUACULTURAL OPERATION

5.1 Description of other users

Other users and / or important habitat in the areas include:

Along the south shore of Annapolis Basin (from east to west):

- Clements Park (on the inland side of Route 1).
- A wildlife Park.
- Upper Clements Cottages and RV Park.
- Cornwallis Park.
- Municipal wastewater treatment plant (directly across the Joggins Bay from Digby).
- Marina and Digby Yacht Club in Digby.
- Digby Pines Golf Resort and Spa.
- Digby Ferry.

Additional notes:

- No commercial activity and only a very small number of homes on the shore side of Route 1 extending from Annapolis Royal west to Upper Clements Park.
- From Annapolis Royal west to Upper Clements it is all farming on the shore side of Route 1.
- Continuing west to Clementsport there is no commercial activity and little if any private housing.
- Just north of Clementsport there is a small residential community and just a few houses scattered along the shore until you reach Cornwallis Park.
- There is scattered residential intermixed with farming from Cornwallis to Digby
- Very little of anything along the shore from Digby to Point Prim.

Conclusion: no commercial or private entities were recognized that could be in conflict with this proposed site and activity.

Along the north shore of Annapolis Basin (from east to west) starting directly across the bay from Annapolis Royal:

- There is scattered commercial activity and residential housing on the shore side of Granville Rd heading west for a short period after which it becomes farming.
- Activity remains as farming with intermixed forest all the way west until Port Royal National Historic site.
- Continuing west to Victoria Beach Rd there is very little activity with only scattered residents and businesses along the shore side of Granville Rd.

Conclusion: no commercial or private entities were recognized that could be in conflict with this proposed activity.

5.2 Significance of proposed area to wildlife

Through a review of the Nova Scotia Species at Risk website it has been concluded that the proposed site will not impact any species of concern. Species of concern for Nova Scotia appear limited to coastal areas, wetlands, inland areas or freshwater habitats. Our proposed sites do not impinge on any of these habitats. Furthermore, those species of concern that do migrate would not migrate through our proposed site location.

Atlantic salmon of the Inner Bay of Fundy is known to be at risk of extirpation. Salmon are known to exist in Annapolis Basin and would likely migrate through these bays. There are no known impacts related to oyster gear on salmon migration. As such, the site proposed here is not deemed to be a risk to this species.

With respect to marine mammals, porpoises, sturgeons and seals are observed regularly. Whales would be a rare occurrence. These marine mammals have co-existed in the Basin around the existing rope gear fishery and finfish aquaculture leases (1039, 1041) without any incidents of entanglement. As such, risks related to this new lease application on marine mammals in the region is considered low.

5.3 Impacts to other users including wildlife

Other users in Annapolis Basin that have not already been mentioned include recreational boaters and, boat tours primarily. Given the small amount of area as compared to the total water areas involved, any impact on these users is deemed minor.

The site is located outside normal navigation channels and away from any animal habitat and as such, the area should be of little interest to these users.

5.4 Impacts by other users including wildlife

We do not foresee any impacts to the site by other users. The site will be well marked which should prevent other users from accidentally entering the lease.

SECTION 6: THE PUBLIC RIGHT OF NAVIGATION

6.1 Navigation Protection Act (NPA) approval

A separate document has been submitted as a stand alone document to Transport Canada.

SECTION 7: THE SUSTAINABILITY OF WILD SALMON

7.1 Identification of local salmon populations

In the Annapolis Basin, salmon are known to occur in the Annapolis River (DFO Science, Stock Status Report D3-12, 1998). Bear River First Nation is also aware of a small salmon population in the east branch of Bear River. These salmon are not part of the Inner Bay of Fundy stock, instead spending two winters in the northwest Atlantic before returning.

The biggest threats to salmon are disease transfer, genetic transfer, loss of habitat and interruption of migration. None of these factors are considered to play a role within this project.

7.2 Support of the sustainability of wild salmon

After a review of Google Scholar, the National Science Library and DFO Science (using keywords “salmon” + “oyster”) no scientific evidence of oyster farms negatively impacting salmon survival or migratory patterns could be found.

SECTION 8: THE NUMBER AND PRODUCTIVITY OF OTHER AQUACULTURE SITES IN THE PUBLC WATERS SURROUNDING THE PROPOSED AQUACULTURAL LOCATION

8.1 Identification of other aquaculture sites

All aquaculture sites within approximately 15km are included in the table below. The Provinces aquaculture mapping tool was used to estimate distances (km) from the center of the proposed experimental lease to the center of these existing leases.

Existing Sites	Distance to Proposed Lease
1039	6
1040	4
1041	3
1042	2
1338	6
1339	5
1340	13
1342	8
1343	7

8.2 Interactions with other aquaculture operations

The preponderance of aquaculture activity in the area involves soft-shell clam and quahog operations owned by Innovative Fishery Products. These leases are intertidal and are worked from the shore. As such, no impact or conflict is anticipated between our proposed site and these existing leases.

Other activities include Atlantic salmon farms (1039 and 1041). No direct impact between our site and these leases is anticipated. Given the biological differences there is no concern regarding disease or genetic transfer. There is some concern regarding the use of sea lice medications and their potential impact on the oysters. However, given the distances involved, this risk would be low.

From a biosecurity perspective, the movement of seed, people and gear are considered the greatest risk to shellfish operations and these will be controlled in the following ways:

- Any site visitors will be required to declare whether they had visited a shellfish operation within the last 24 hours. Anyone who has declared in the affirmative will be required to disinfect their hands and will be required to ensure they are wearing outer wear and footwear that has either been disinfected or was not used on the other site.
- No shellfish gear or vessels will be shared with other shellfish producers nor will other used shellfish gear or vessels be borrowed / leased from other producers.
- Any used shellfish gear or vessels purchased for use on our farm will be cleaned, disinfected and air dried before use on our farm
- Any seed brought in from producers will be assessed for disease risk and will be treated as per DFO requirements to protect against invasive species.

The operation does launch from a public wharf located in Digby, NS. Two boats are used to work the lease. These boats are cleaned at the end of each day at the wharf. Bilge will not be emptied at the shellfish site.

SECTION 9: DEVELOPMENT VIABILITY

9.1 Financial ability

[redacted]

9.2 Technical viability

The experimental plan is detailed in Appendix A. Once funding is secured, a management team will be formed. This team will be composed of Bear River First Nation, and the Ulnooweg Development Group. The Ulnooweg Development Group will bring technical expertise through its Aquaculture Advisors as well as funding support.

Additional expertise may be brought in as required to ensure the work is carried out as per the experimental plan. The funding needed to support these additional staff would be sourced through the AICFI program.

9.3 Compliance history

Bear River First Nation takes an active role in the FSC and, commercial lobster fishery and does so in a manner that is respectful of the laws of the land and of other users of the resource.

Bear River has also managed several experimental leases in Annapolis Basin and St Mary's Bay since 2019. These leases have been well managed and followed all federal and Provincial laws and reporting requirements.

Bear River also plays an active role in wildlife conservation through its ecological monitoring programs, including the monitoring of ecosystem health of the Bear River watershed.

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APPENDIX A

Experimental Plan

Development of a Commercial Scale Oyster Farm System for Annapolis Basin

Summary

The goal of this work is to apply the technological concepts developed from research conducted in the area since 2019 to a new experimental site chosen for its depth profile, to test modifications to the mooring system to create infrastructure that is more scalable for the purpose of commercialization, to test various processes to help improve growth and survival rates of oysters and to test the performance of other species, namely scallops, mussels and specified seaweeds.

Introduction

Through past work conducted in leases 5003 – 5006 it was found that inadequate depth was available at any of these sites to support commercial scale production. When work was first carried out it was anticipated that a minimum of 4m water depth would be suitable (industry standard). However, due to the unique characteristics of this area (high currents and high tidal fluctuation), 5m or more depth has been found to be ideal. This finding resulted in the conclusion that none of the existing areas under exploration would be suitable for commercial development.

As such, a consultant was engaged to find a new location within the general area that would have suitable depth. This area was chosen with consideration to fishing activity, recreational activity, existing aquaculture activity, etc (see Development Plan).

Although this new site will allow Bear River to get into an area with suitable depth, there are critical questions that remain with respect to the feasibility of oyster farming in the Annapolis Basin. These critical questions are:

- Creating balanced tension on low and high tide.
- Identifying anchoring solutions.
- Identifying growth and survival rates.
- Identifying optimum stocking densities.
- Developing optimum husbandry techniques.

Experimental Methods

To answer the above questions, the following experimentation will be carried out:

- Up to three grid systems will be deployed (Appendix C). These grid systems will employ elastomer moorings (TBI) and screw anchors similar to the elastomer system operating on 5006 (Appendix C). The main change will be the addition of the grid system below water level.
- Each grid will be populated with approximately 45,000 oysters ranging in size from 25 – 65mm.
- Source of oysters is yet to be identified and will be dictated by availability and ability to transfer to our area.
- Depending on timing of lease approvals and ability to secure equipment, the grids will be installed and populated with oysters as detailed above and in Section 2.1 of the Site Development Plan either in fall 2025 or spring, 2026.
- Each of the three grids will contain different mooring systems. Various mooring systems are currently being evaluated with the goals being to choose systems that are cost effective, minimize environmental impact and are robust.
- A total of 18 bags across each grid will be monitored for growth, and survival. Figure 1 below provides an example of the general location of each cage. Further details as follows:
    - Experimental cages will be stocked at one of three densities (250 pcs, up to 375 pcs or up to 500 pcs per bag). The bags stocked at 250 pcs and held at surface are controls representing industry standard stocking density and holding conditions while the other bags, stocked at up to 1.5x and up to 2x industry standard are the experimental groups. We are already testing different stocking densities now with the result of these trials potentially being reflected in the final choice of experimental stocking densities to be tested.
    - Bags will be chosen randomly from areas on the outside and inside of the area under production as exemplified in Figure 1 below.
    - These cages / bags will be marked as experimental and will remain in their same location throughout the growing season.
    - One line on each grid will be submerged and will remain this way through-out the trial period (ie. spring, summer, fall and winter).
    - Oyster length and width will be recorded for a sample taken from each bag with three recordings (spring, summer, fall). Sub sample size will be determined using standard statistical methodology.
    - Oyster nutritional status and meat yield will be considered and will be dictated by growth / survival results. For example, if product is growing and surviving well, it will be assumed the animals are feeding well and nutritional / meat yield work will not be carried out.
    - Mortality will also be recorded at the same time that measurements are taken.
    - Oyster growth and mortality will be followed all the way through to cocktail size (75mm+) estimated to be 2-4 seasons.

Figure 1. Experimental cage / bag locations for each grid (Total of Three Grids)

5016

	Cage 1			Cage 2			Cage 3			Cage 4			Cage 5			Cage 6			Cage 7			Cage 8			Cage 9			Cage 10		
Line 1 Submerged	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3
	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6
Line 2 At surface	Cage 1			Cage 2			Cage 3			Cage 4			Cage 5			Cage 6			Cage 7			Cage 8			Cage 9			Cage 10		
	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3
	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6
Line 3 At surface	Cage 1			Cage 2			Cage 3			Cage 4			Cage 5			Cage 6			Cage 7			Cage 8			Cage 9			Cage 10		
	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3	B1	B2	B3
	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6	B4	B5	B6

Growth / Survival

250 pcs

375 pcs

500 pcs

The above is a representation with final choice of bag locations and submerged lines to be chosen once the trials are initiated.

Additional Experimentation

Simultaneous to the above main work, smaller scale and more informal experimentation may also be carried out with other species, specifically, the seaweeds Saccharina latissimi (sugar kelp), Laminaria digitata and / or Alaria esculenta as well as with bay scallops, blue mussels and European oysters. As stated, this work would be smaller scale with the main goal being to learn about how these species grow and survive in the Basin and how industry standard technologies used to grow these species perform in the Basin.

Work may also be done involving oyster nursery grow-out experimentation with the goal being to observe how well hatchery seed survive and grow in the Basin using low tech options such as screen bags.

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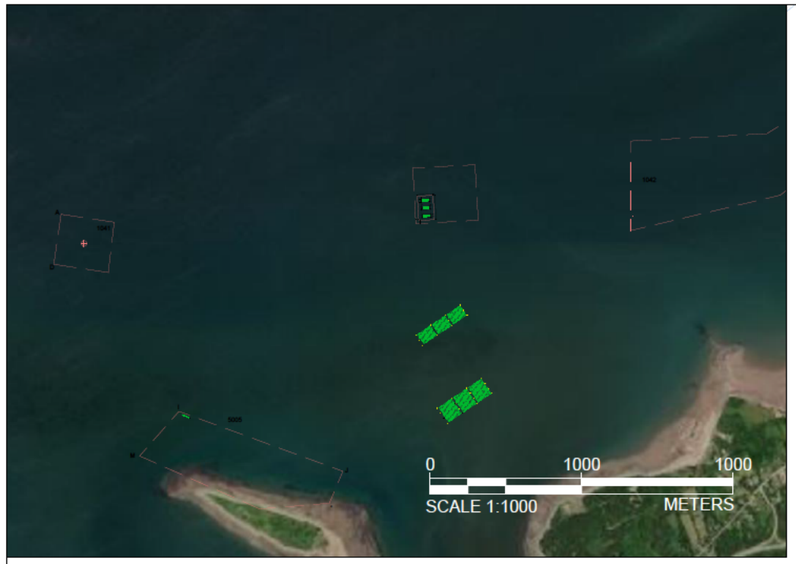
[redacted]

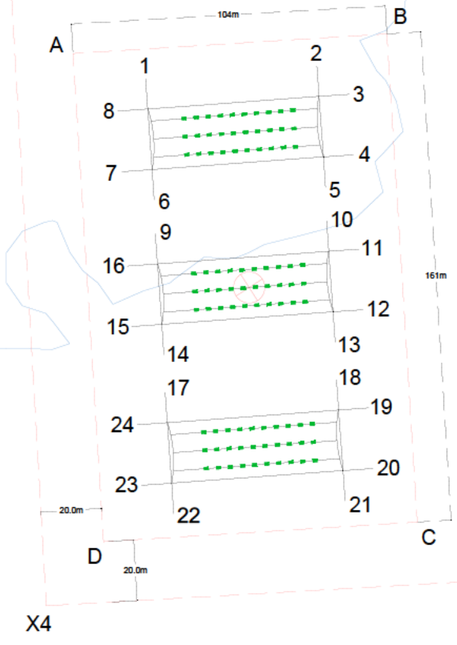
APPENDIX C

New Site Details



TO X1

ELASTOMER TEST GRIDS - SHOWN FOR DISCUSSION PURPOSES ONLY. NO ANALYSIS HAS BEEN COMPLETED

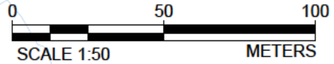


8m

6m

TO X3

X4



BEAR RIVER FIRST NATION

ANNAPOLIS BASIN
NS, CANADA

PROPOSED EXPERIMENTAL SITE LOCATION

FEATURES

BATHYMETRY WITH DEPTH 5

LEASE CENTER

LEASE BOUNDARY

LEASE BOUNDARY CORNERS:
X1: 44° 39.050'N, 65° 41.557'W
X2: 44° 39.069'N, 65° 41.247'W
X3: 44° 38.872'N, 65° 41.222'W
X4: 44° 38.852'N, 65° 41.532'W

PROPOSED EXPERIMENTAL LEASE:
A: 44° 38.950'N, 65° 41.530'W
B: 44° 38.956'N, 65° 41.452'W
C: 44° 38.869'N, 65° 41.440'W
D: 44° 38.864'N, 65° 41.518'W

LEASE CENTER:
44° 38.910'N, 65° 41.484'W

PROPOSED ANCHOR COORDINTAES:
1: 44° 38.946'N, 65° 41.512'W
2: 44° 38.950'N, 65° 41.469'W
3: 44° 38.945'N, 65° 41.461'W
4: 44° 38.934'N, 65° 41.459'W
5: 44° 38.928'N, 65° 41.466'W
6: 44° 38.925'N, 65° 41.508'W
7: 44° 38.930'N, 65° 41.517'W
8: 44° 38.940'N, 65° 41.518'W
9: 44° 38.919'N, 65° 41.508'W
10: 44° 38.922'N, 65° 41.465'W
11: 44° 38.917'N, 65° 41.457'W
12: 44° 38.907'N, 65° 41.455'W
13: 44° 38.901'N, 65° 41.462'W
14: 44° 38.897'N, 65° 41.505'W
15: 44° 38.902'N, 65° 41.513'W
16: 44° 38.913'N, 65° 41.515'W
17: 44° 38.891'N, 65° 41.504'W
18: 44° 38.894'N, 65° 41.461'W
19: 44° 38.889'N, 65° 41.453'W
20: 44° 38.878'N, 65° 41.452'W
21: 44° 38.872'N, 65° 41.458'W
22: 44° 38.869'N, 65° 41.501'W
23: 44° 38.874'N, 65° 41.509'W
24: 44° 38.885'N, 65° 41.511'W

NOTES:
1. BATHYMETRY DATA SOURCE: CHS CHARTS
2. ORIENTATION OF THE GRIDS WAS CHOSEN BASED ON THE PREDICTED DOMINANT CURRENT HEADING

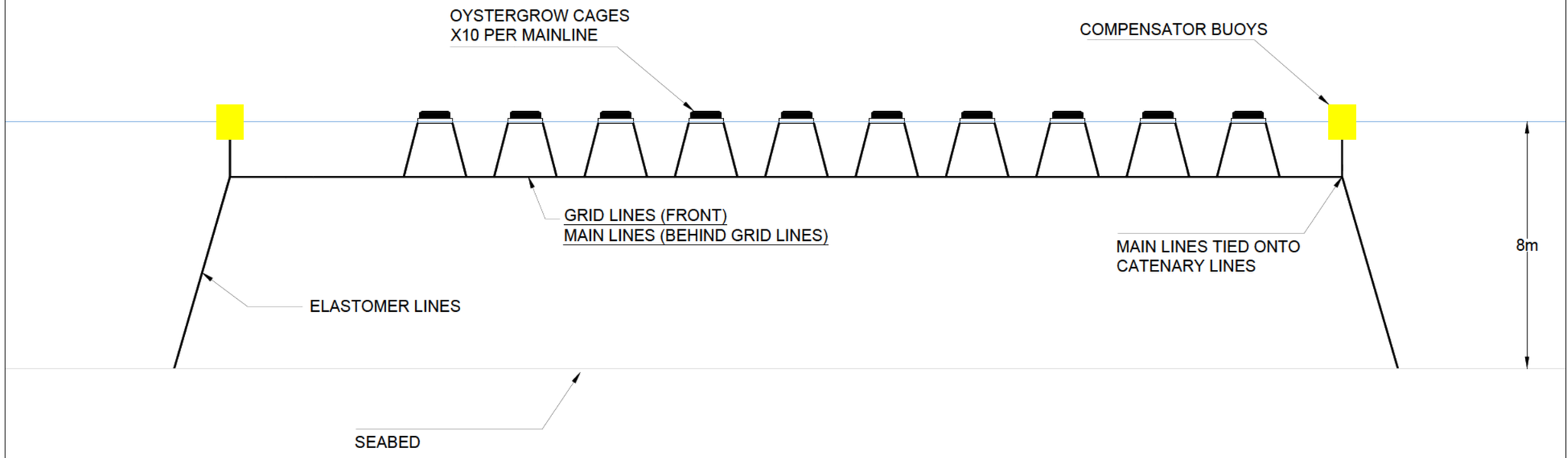
DSAocean

DRAWING NUMBER: DSA-BRF-25EME-D01

SHEET 1 OF 3

DRAWN BY:	BGW		
CHECKED BY:	CJW	LAST REVISED:	2025-08-28
APPROVED BY:	CJW	REVISION:	C-IFR

ELASTOMER TEST GRIDS - SHOWN FOR DISCUSSION
PURPOSES ONLY. NO ANALYSIS HAS BEEN COMPLETED



NOT TO SCALE

BEAR RIVER FIRST NATION

ANNAPOLIS BASIN
NS, CANADA

SIDE PROFILE

DSAocean

DRAWING NUMBER: DSA-BRF-25EME-D01

SHEET 2 OF 3

DRAWN BY:	BGW		
CHECKED BY:	CJW	LAST REVISED:	2025-08-28
APPROVED BY:	CJW	REVISION:	C-IFR

BEAR RIVER FIRST NATION

ANNAPOLIS BASIN
NS, CANADA

SINGLE GRID CELL

LEGEND

COMPENSATOR BUOY

OYSTER CAGE

NOTES:
1) ALL DIMENSIONS SHOWN ARE HORIZONTAL DISTANCES

DSAocean

DRAWING NUMBER: DSA-BRF-25EME-D01

SHEET 3 OF 3

DRAWN BY:	BGW		
CHECKED BY:	CJW	LAST REVISED:	2025-08-28
APPROVED BY:	CJW	REVISION:	C-IFR