



**Environmental Assessment
Registration Document**

**Stephenville Crossing Soft Shell Clam Farm
Crown Lease Application 148194**

Submitted By:

Mills Aquaculture Newfoundland Ltd

January 4, 2016

Registration Pursuant to Section 49 of the Environmental Protection Act

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Name of Undertaking: Stephenville Crossing Soft Shell Clam Farm

Proponent:

The proponent is Mills Aquaculture Newfoundland Ltd., a wholly owned subsidiary of Mills Aquaculture Inc., of Bouctouche NB, a company with four generations of experience in the harvesting, processing and marketing of bivalve shellfish. Not only will the proponent avail itself of the experience of its parent company for aquaculture operations, but in doing so will be placing emphasis on safety and protection of the environment.

i. Name of Corporate Body:	Mills Aquaculture Newfoundland Ltd
ii. Newfoundland and Labrador Contact:	Corporate Services Department Stewart McKelvey PO Box 5038 St. John's NL A1C 5V3
iii. Chief Executive Officer:	Mr. Charles Anastasia, President Tel: (603) 501-8515 Email: canastasia@millsaquaculture.ca
iv. Principal Contact:	Marilyn Clark Director of Development Mills Aquaculture Inc. 5 Mills St. Bouctouche, NB E4S 3S3 Tel: (506) 380-8407 Email: mclark@millsaquaculture.ca

The Undertaking:

Mills Aquaculture Newfoundland of Saint John's, Newfoundland and Labrador is seeking a "Licence to Occupy" from the Lands Division, Department of Environment and Conservation, to develop and operate a soft shell clam (*Mya arenaria*) aquaculture farm at Stephenville Crossing.

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Description of the Undertaking:

i. Geographic Location:

A portion of Crown Land in the inter-tidal zone at the head of St. George's Bay (N 48' 29.838 - W 58' 24.632), locally known as Mattis Point, Stephenville Crossing, to the east of the Highway 461 bridge (over the Main Gut, or mouth of St. George's River). Total size of the site is 337.89 ha. Please see the attached map.

ii. Physical Features:

The site is protected from the open sea being inside the main gut of the St. Georges River. It is comprised of sand flats, mud flats, loose gravel and small rocks, ranging in size from fine to medium sand grains to poorly sorted boulder gravel. Tidal range from .5 to 1.5 meters is normal in the area. The site is adjacent to the main channel at the mouth of the St. George's River. There are six cabins on an island on the western side of the site. There are no sewer outfalls, ocean disposal sites, or industry near the area (and no industrial pollutant). There are no neighboring aquaculture sites, boating is limited due to shallow water, there are no slipways or wharves. There is a salmon fishery upstream of the area.

iii. Construction:

The aquaculture operation will not require the establishment of infrastructure on or near the site. The area will be accessed by boat launched from established facilities in St. George's.

There will be no land development, no on-land structures and no fixed gear in the water. There will be no chemical wastes such as paints and cleaning products.

iv. Operations:

a) General: The long-term goal of this farm is to establish efficient and sustainable clam harvests while maintaining sound environmental practices. Mills Aquaculture Newfoundland Ltd is proposing to demonstrate that a viable aquaculture industry for bivalves, particularly soft-shell clams (*Mya arenaria*), can be developed in Newfoundland.

The softshell clam occurs throughout Newfoundland. Softshell clams bury 15 to 35 cms in the substrate, and can take four to six years to maturity. Traditional exploitation has been by manual diggers in the inter-tidal zone. The species enjoys strong international demand. It is not known why the fishery has not developed in Newfoundland and Labrador, but it probably is a result of limited access to markets. The parent company, Mills Aquaculture Inc, has ready access to markets, and has sourced product from all other Eastern Canadian provinces.

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- b) Wild Stock Production:** A stock assessment on the proposed lease site was undertaken in 2014-15 in collaboration with a DFA biologist as per conditions prescribed in a DFO Experimental Permit and a strict sampling protocol. The standing commercial biomass was estimated at 196,000 kgs. Projected harvest over the first two years of operation will cover approximately 160 ha over each of the first two years, and is forecast to yield 93,000 kgs annually. Spat and juvenile densities found on site suggest strong annual recruitment.

Because this area has not been harvested in recent years, it may contain senescent bivalves that are no longer productive. Accordingly, the production plan has two steps: 1) harvesting and reconditioning of the sites; and 2), implementing a bivalve aquaculture program.

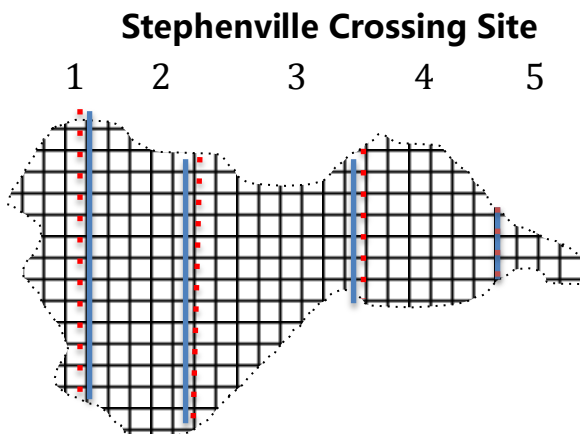
- c) Harvesting Protocol:** The lease would be divided into three parts: five percent of each location would be left alone to serve as a control for comparison with other treatments; the remainder would be divided into two equal parts that would be harvested, reconditioned and reseeded over two years.

Harvesting will normally begin in April and continue into November. The bed will be harvested in a rotational manner over a period of not less than two years. An evaluation will be made of the biological and economic effects of harvesting methodology, particularly to establish a protocol for reconditioning and oxygenation of the substrate for bivalve aquaculture.

- d) Aquaculture Strategy:** Spat will be collected on site or from sites adjacent to the lease areas in accordance with existing DFO regulations and guidelines. Juveniles will also be acquired from adjacent sites. Introduction and Transfer authorizations are therefore not anticipated as a requirement.

Various aquaculture techniques will be compared to plots where only natural seeding was allowed after harvesting, and to the control areas that were never fished. The aquaculture plan calls for subdividing the area into equally sized subareas to compare enhancement techniques:

- 1) Unfished Controlled
- 2) Natural seeding
- 3) Seeding with juvenile clams;
- 4) Seeding with spat;
- 5) Seeding plus protection from predators



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The final strategy will be designed with support from the NRC IRAP program (project on hold pending approval of licences and start-up of operations) in collaboration with DFO and presented to Department of Fisheries and Aquaculture officials before beginning harvest and reconditioning of sites.

Specifically, it will address:

- 1) Site characterization with respect to distribution of bi-valves, sediment, and vegetation;
- 2) Confirming the status of the resource;
- 3) Acquiring baseline data to measure the results of resource enhancement;
- 4) Developing reseeding strategies appropriate for the site; and
- 5) Developing a process to predict annual variations in product volume.

e) Harvesting Methodology: One or all of three harvesting alternatives may be regularly applied to harvesting. If harvesters are available, digging in the intertidal zone at low water using traditional hacks or shovels, hand held mechanical hydraulic harvesters powered by small portable motors (e.g. 8 hp) on skills in tidal zone at mid tide, and using University of Maryland harvesters from barges of 24 feet in length or more in several meters of water.

From an environmental perspective, mechanical harvesters are preferred for both efficiency and minimizing disruption to aquatic habitat. Data obtained from field studies reveal that the efficiency of hydraulic harvesters is approximately 74 per cent, compared to 60 per cent for hand methods,¹ and that the yield rate for a hydraulic harvester is three times the yield rate obtained with hand methods;² In a study conducted in Gaspé, mechanical harvesting was estimated to be half as expensive as hand harvesting.³

Issues that may result include re-suspension and turbidity, smothering, release of contaminants, release of nutrients, decreased water quality, disturbance of infauna, and effects on other fishery resources. Coen (1995) found that none of these environmental concerns could be distinguished from natural variation in the estuarine ecosystem.⁴ Turner et al. (1995) noted that resilience and persistence are characteristic of benthic communities in shallow-water coastal and estuarine systems, which are adapted to continual disturbances.⁵

In a comprehensive study at Malbaie, Quebec, the SODIM group concluded that three months after harvest there were no noticeable ecological differences between mechanical and hand harvesting.⁶

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The U.S. agency NOAA conducted a similar study on the University of Maryland mechanical harvesters, and reached similar conclusions: “Based on our review of the published literature, the physical, biological, and chemical effects of shellfish dredging within the inshore coastal zone are generally short lived with the rate of recovery varying among studies”. It also concluded that dispersed sediments might take 30 min- 24 hrs to resettle. Compared to long term, natural wind- induced suspension of sediments and nutrient loading from land run off, release of suspended sediments during dredging can be relatively minor. ⁷

It goes on to state, “shellfish farmers must manage leased bottom responsibly since successful clam farming depends on sustainable harvesting of product and healthy seafloor environments”. It also confirmed “shellfish dredging can break up hard packed sediments, just as farmers till fields to turn over and aerate soil. Following harvests of clams or oysters, beds are generally left undisturbed for several years or reseeded and not dredged again until the young reach commercial size. This provides much the same benefit as when upland fields are allowed to rest between the planting of crops. When shellfish beds are allowed to remain undisturbed, the temporary alterations in the benthic community structure caused by dredging revert to pre-harvest conditions”.

The Stephenville Crossing site has mainly sandy bottom. It is expected that dredged areas would fill in and become unrecognizable on the following tide. Mills Aquaculture Inc. has an ongoing assessment of mechanical clam harvesting at its active clam leases in Miramichi Bay, New Brunswick, where the environment is similar. The project is being done in collaboration with DFO scientists under its ACRDP program. The results from that study will inform operations in Newfoundland and Labrador. The project has the following objectives:

- To investigate the impact of a hydraulic dredge on the physical and chemical properties of the sediment.
- To investigate the impact of a hydraulic dredge on the population structure of *Mya arenaria*.
- To investigate the impact of adding crushed clam shells to the physical and chemical properties of the sediment
- To investigate the impact of adding crushed clam shells on the population structure of *Mya arenaria*

f) Waste Products: All bi-valves will be harvested with the principal focus on soft shell clams. Juvenile clams would be returned to prescribed re-seeding plots onsite. If present, predatory species such as starfish and invasive species such as green crab will be recorded and destroyed. All waste material will be collected and brought to the approved Provincial landfill site at St. George’s for disposal.

There will be no other operational debris and refuse (e.g., rope, buoys, litter, etc.). Undersized product and shells will be returned to the bottom. There will be no drop-

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off or harvesting wastage. There will be no pseudo feces. There will be no bio-fouling material (e.g. to mitigate organisms that accumulate on barges, moorings).

- g) Canadian Shellfish Sanitization Program (CSSP):** The Stephenville Crossing Site is tested and classified by Environment Canada as a conditionally restricted area. The CSSP requires that clams harvested from restricted areas must be depurated in a strictly controlled environment. Among the options is a depuration process known as “relaying”, and procedures are prescribed in the CSSP “Manual of Operations”.⁸

Mills Aquaculture Inc is uniquely suited for this procedure with its extensive proven experience to meet CSSP and USFDA guidelines.

Agreement-in-principle has been reached to secure an existing aquaculture lease for a relay site that is situated in an “Approved” area in Piccadilly Bay (Site # 834.570 – See Figure 5). Clams from the Stephenville Crossing clam farm lease will be transported in accordance with CSSP security requirements, 52 Km by truck to Head Harbour, Piccadilly Bay, and then by boat 300 meters to the approved relay site, where they will be submerged and held until tests, overseen by CFIA, conclude that they can be certified for export. It is anticipated that this procedure will require up to seven days. The product will then be re-examined to remove any dead clams, and stored in refrigerated trucks at Piccadilly for later shipping to Bouctouche, NB for labelling and export to markets in the United States. Dead clams will be disposed at the provincial landfill in St. George’s.

Testing protocols for both water quality and clam health have been approved by the Atlantic Regional Interdepartmental Shellfish Committee (ARISC). Members of this committee are the participating federal agencies that regulate the CSSP, (Canadian Food Inspection Agency, Environment Canada, and Fisheries and Oceans Canada). The Department of Fisheries and Aquaculture has approved an amendment to the established Piccadilly lease to facilitate the relay procedure for softshell clams.

- h) Resource Conflicts:** There are no known fisheries in the immediate area of the proposed farm. (See attached map⁹). However, there are two “Class 2 Scheduled” salmon rivers¹⁰ that flow into the estuary: Southwest and Bottom Brooks, and the Harry’s River watershed.

The largest dredging project in Canada occurred in Miramichi River’s estuary without any adverse impacts being noted on the world’s largest Atlantic salmon population.¹¹ While this suggests that there would be no interaction between harvesting operations and the migrations of anadromous fish, agreement has been reached with Environment and Conservation officials on mitigation measures to cease harvesting operations during salmon runs to ensure that they do not interfere with salmon run timing, or recreational or aboriginal fisheries for anadromous species (e.g. Harry’s River Atlantic salmon run). Specific operational protocols will be established prior to the commencement of harvesting operations through discussions with fishers’ representative organizations.

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In addition, although eelgrass has not been identified on the site, any areas that may be identified with coverage greater than 50% eel grass density of eelgrass beds will be avoided.

- i) Site Specific Environmental Issues:** Aside from potential water quality classification changes administered by Environment Canada under the CSSP, the sites are not subject to any other water quality risk factors. Industrial effluents have not been identified in the area and, according to locals, vandalism has not been an issue in the past. There is relatively no boating or fishing activity in the area due to the low depth of water.
- j) Unearthing of Artefacts:** The Provincial Archaeology Office (PAO) identified potential for unearthing historical artefacts. To mitigate this concern, Mills has issued an RFQ to several archaeologists for the development and delivery of a staff-training program. The successful bidder has been chosen, and training will begin when harvesting is permissible.
- k) Fuel Spills:** To minimize risk of fuel spills, refuelling activities will take place on land and other petroleum products will be replenished while tied to the wharf. In preparation for such a spill an adequate supply of absorbent pads will be kept on hand at all times to ensure that any potential spill is contained. After use the pads will be collected in large heavy gauge plastic bags and transported to the local waste disposal area in St. George's.
- l) Debris:** In the event that adverse weather conditions result in debris being scattered over the site, the proponent will ensure proper clean up with the collected litter being transported to the landfill site at St. George's.
- m) Species At Risk:** The proponent has consulted with DFO and Environment Canada and will ensure that all staff is familiar with "Species at Risk" and measures to record and report, as well as the COSEWIC list of species under consideration. They will be briefed on endangered species and species of "Special Concern" and courses of action when they are encountered. Staff will also be trained on precautionary action when species of "Ecological Significance" (e.g. eel grass beds) are encountered.
- v. Occupations:** ¹²
Combined labour for three farm sites (Piccadilly, Seal Cove, Stephenville Crossing):
- NOC Code 2121: Biologist (One Full Time Position)
 - NOC Code 222: Technicians (Two Full Time Seasonal Positions)
 - NOC Code 8252: Operations Supervisor (One Full Time Seasonal Position)*
 - NOC Code 8613: Harvesters & Labourers (Twenty Full Time Seasonal Positions)*
- *Job Fair Held in Stephenville, June 2015 in anticipation of project commencement in July 2015.*
- vi. References Documents:**
Application Number 148194 for a Crown Licence Title to Pursue Soft Shell Clam Aquaculture Farming, June 2015.

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Schedule

Soft shell clam aquaculture is relatively new to Newfoundland and Labrador. The introduction process will require extensive new technology and transfer activities. It is expected to take 5 years for growth from spat to commercial size. The multi-year development program outlined above is based on a sustainable, scientific process to ensure that soft shell clams can be grown and harvested continuously. Preparations for operations to commence in April 2016 will begin immediately upon approval of licences.

Funding

Start-up funding will be provided from Mills Aquaculture Inc. Since forward-looking projections involve risks and uncertainties, the business plan is premised on an initial production model with sales volume below the scientific projection on yield rate. The business plan also does not consider financial support that may normally be available for new start up operations in Newfoundland. The following has been solicited:

- **ACOA:** ACOA contributed to development of the business plan (January, 2015)
- **NRC:** IRAP funding for projects is on hold, pending licensing approval to fully characterize the site and develop aquaculture procedures, and to develop a prototype hydraulic harvesting system and barge for Newfoundland and Labrador.
- **NL FTNOP:** Support for development of a prototype hydraulic harvesting system and barge for Newfoundland and Labrador is pending approval of lease application and availability of funds.
- **NL Business Investment Fund:** The submission of a formal application is on hold pending issuance of leases.

Approval of the Undertaking:

Initial referrals to all agencies with interest vested in this project were launched by DFA, in February and March 2015, consistent with its “one Window” aquaculture application process. Several agencies suggested changes, which were then incorporated into the company’s plans. Following this, Mills personnel approached fishermen’s organizations (NFFAWU) and communities (Stephenville Crossing) to brief them on the proposal.

In addition, the DFA referral process specified that public notice must be provided. Accordingly, advertisements were placed twice in The Telegram and The Western Star newspapers on March 14 and 21, 2015.

Consultations were also held with several community leaders in the Stephenville area including the Chair of the Piccadilly Local Service District, the Mayor of Stephenville, the Mayor of St. George’s and the Town Clerk for Stephenville Crossing. All parties had a positive outlook for our proposed operation and provided letters/emails of support. In

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addition, as recommended by DFA, a meeting was also held with a representative of the Fish Food and Allied Workers Union.

In July 2015, then Fisheries and Aquaculture Minister Vaughn Granter approved the aquaculture licence. DFA officials then referred the application to Crown Lands for the necessary Occupational Permit.

A list of the main permits, licences, and approvals for this project is attached (Figure 1).


Figure 1: Approvals, Certifications, Licences and Permits

Approval/Certification/Licence/Permit	Status	Date
DFO Scientific Exploration Permit	Issued & later renewed	June, 2014
DFA Site Application	Accepted by DFA Working Group	November
Site Application Referred to Federal Atlantic Regional Coordinated Committee (ARISC)	Accepted by ARISC	June
DFA Referral Launched		Feb, 2015
DFA Application to Crown Lands	Accepted with modifications	March, 2015
Environment Canada Water Testing	Testing Protocol confirmed	Feb, 2015
CSSP Depuration Application for Relay Site	Accepted by CFIA	August, 2015
DFA Licensing Registrar Referral Process: <ul style="list-style-type: none"> • Community Council Support Letter • Newspaper Advertisements • Archeological Training Protocol • Salmon Protocol • Relay Protocol 	Launched Published Provided Agreed Procedure agreed, subject to testing	March, 2015 March, 2015 May, 2015 May, 2015 Aug, , 2015
Licensing Committee Approval	Granted	June, 2015
Workplace Health Safety and Compensation Registration	Submitted	June, 2015
Aquaculture Licence	Granted*	July, 2015
Crown Lands Referral	Initiated	July, 2015
Buyers Licence	Granted	July, 2015
CNLOPB Approval	Granted	Aug, 2015
CWS Approval	Granted	Aug, 2015
Environmental Registration	Pending*	
Crown Lands Occupational Permit	Pending*	

**Pending Crown Lands Approval*

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Figure 2: Crown Lease Application



Government of Newfoundland and Labrador
Department of Municipal and Intergovernmental Affairs

Lands Branch
Western Regional Lands Office

JUNE 18, 2015

In Reply Please Quote
File Reference No.
3020150

MILLS AQUACULTURE NEWFOUNDLAND LIMITED
12 Rusted Pl
St. John's NL
A1A 5H3

Dear Sir/Madam:

RE: APPLICATION NO.: 148194 -
TYPE: Licence
PURPOSE: Aquaculture Bivalve Harvesting-Clams
LOCATION: Stephenville Crossing

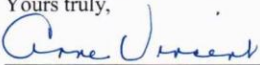
This will acknowledge receipt of the above referenced application for a Crown title. The application has now been registered and via a copy of this letter, the Department and/or agencies on the attached schedule have been asked to forward their comments and recommendations on your application to the Regional Lands Office.

Your application will be reviewed and a final decision will be made when the recommendations have been received from these Departments and/or agencies.

To assist inspectors in locating the area applied for and to avoid delays in processing your application it is advisable to place your name and application number on the site. Your application is being processed for the site indicated on the attached map.

Please note that the land is not to be occupied until you receive a fully executed title document.

If you require any additional information concerning the processing of this application please contact the Regional Lands Office at the address below.

Yours truly,

LANDS OFFICER
Attachment(s)

P.O. Box 2006, Lower Level, Sir Richard Squires Building, Corner Brook, NL, A2H 6J8
Telephone (709) 637 - 2390 or 2391, Facsimile (709) 637 - 8032

Figure 3: Site Map

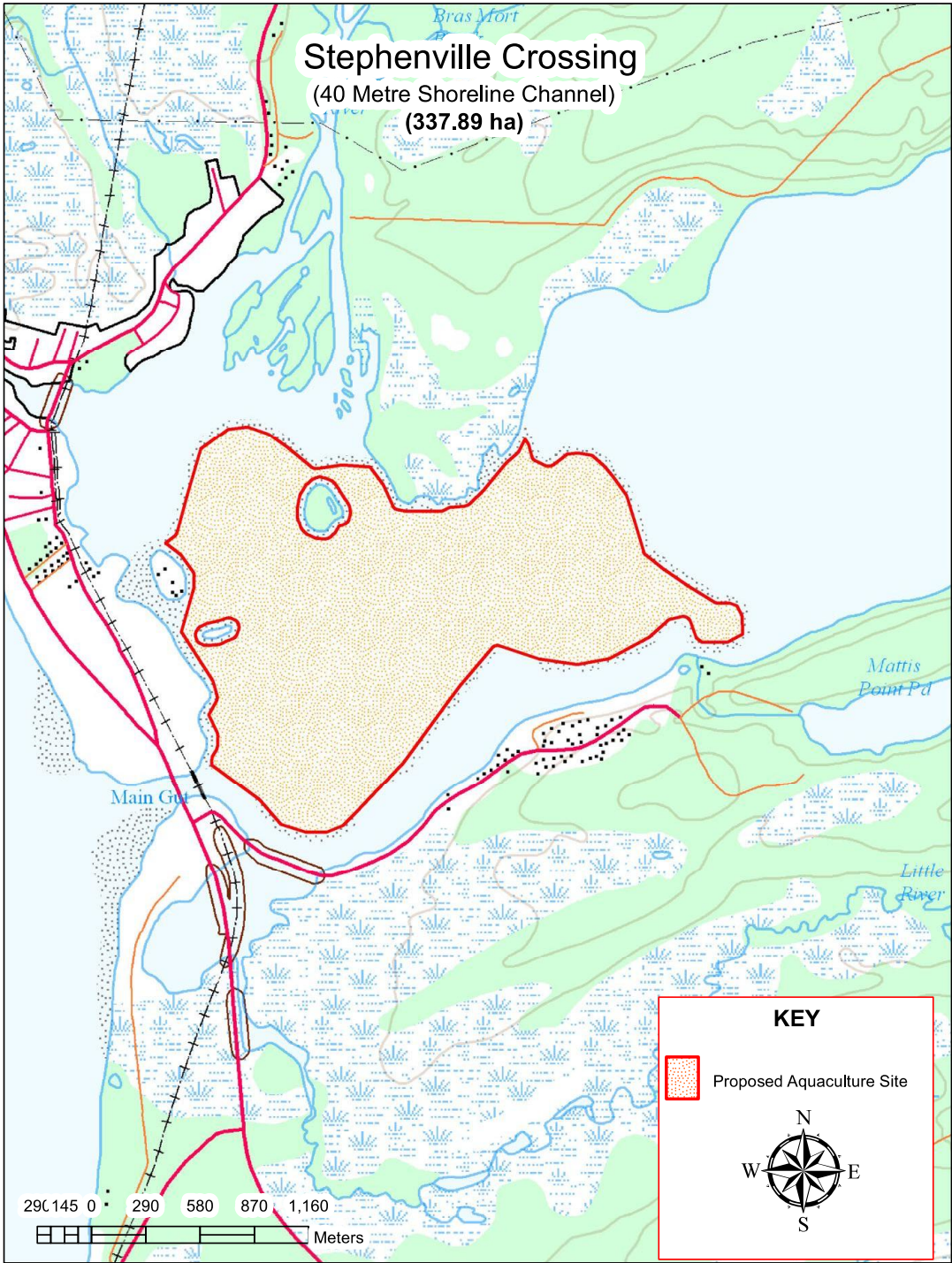
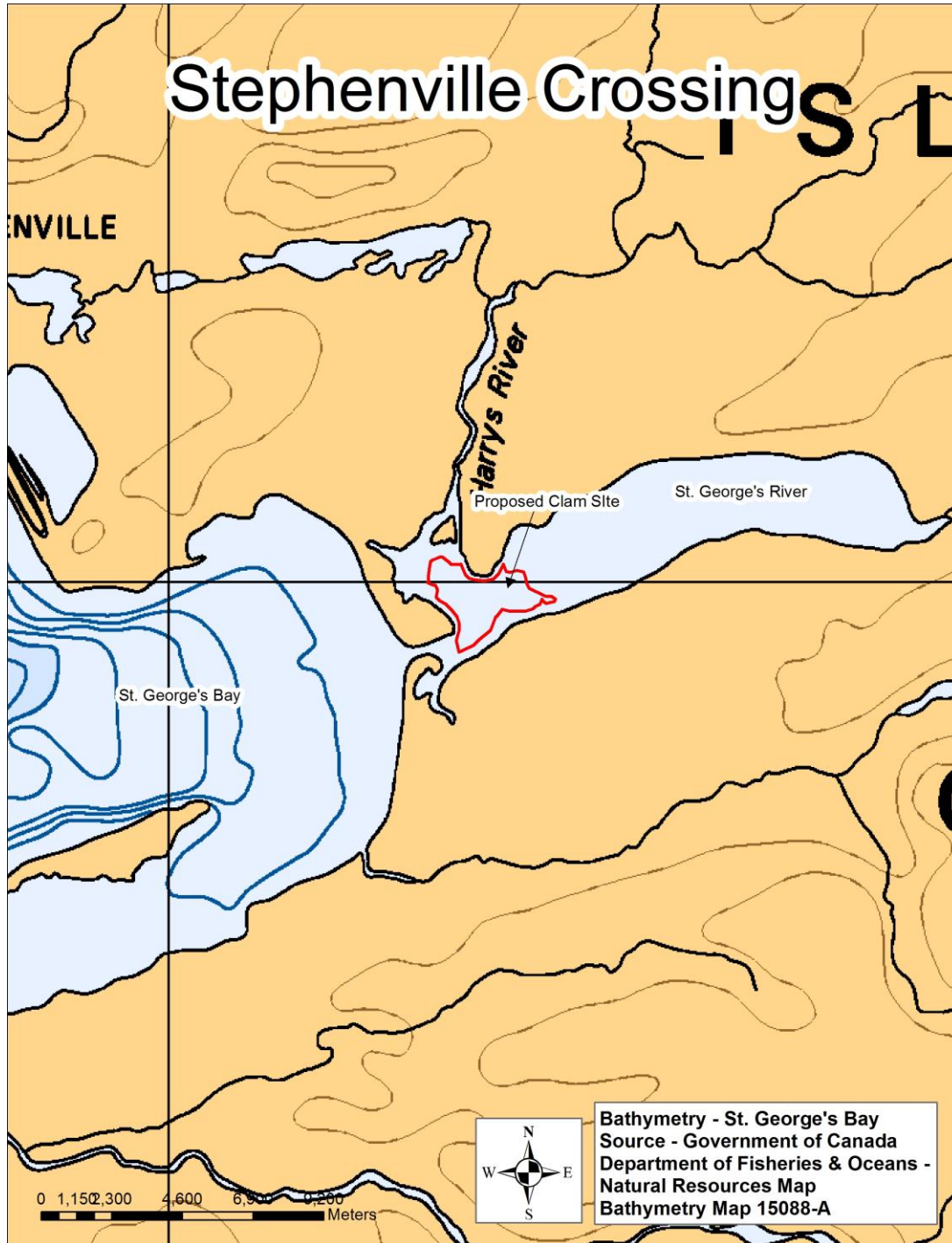
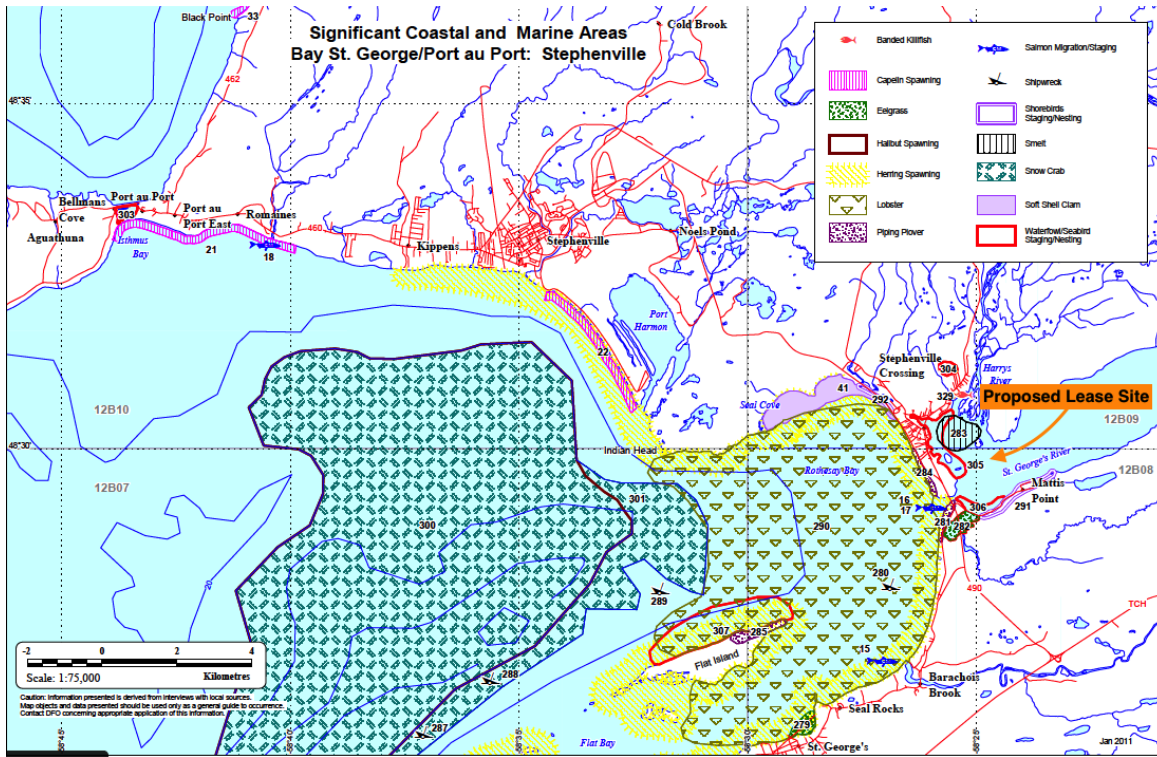


Figure 4: Bathymetry Chart (Source DFA)



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Figure 5: Local Knowledge Map (See Endnote 9)



Map ID	Feature	Additional	Human Activity
283: St. George's River	Smelt are known to overwinter in St. George's River and the estuary of Harry's River.	Atlantic salmon; waterfowl; eels; shorebirds	Recreational fishing; kayaking; bird watching
305: Tidal Flats	Waterfowl & Seabirds	Shorebirds	Recreational fishing, bird watching, kayaking

Figure 6: Piccadilly Bay CSSP Relay Site

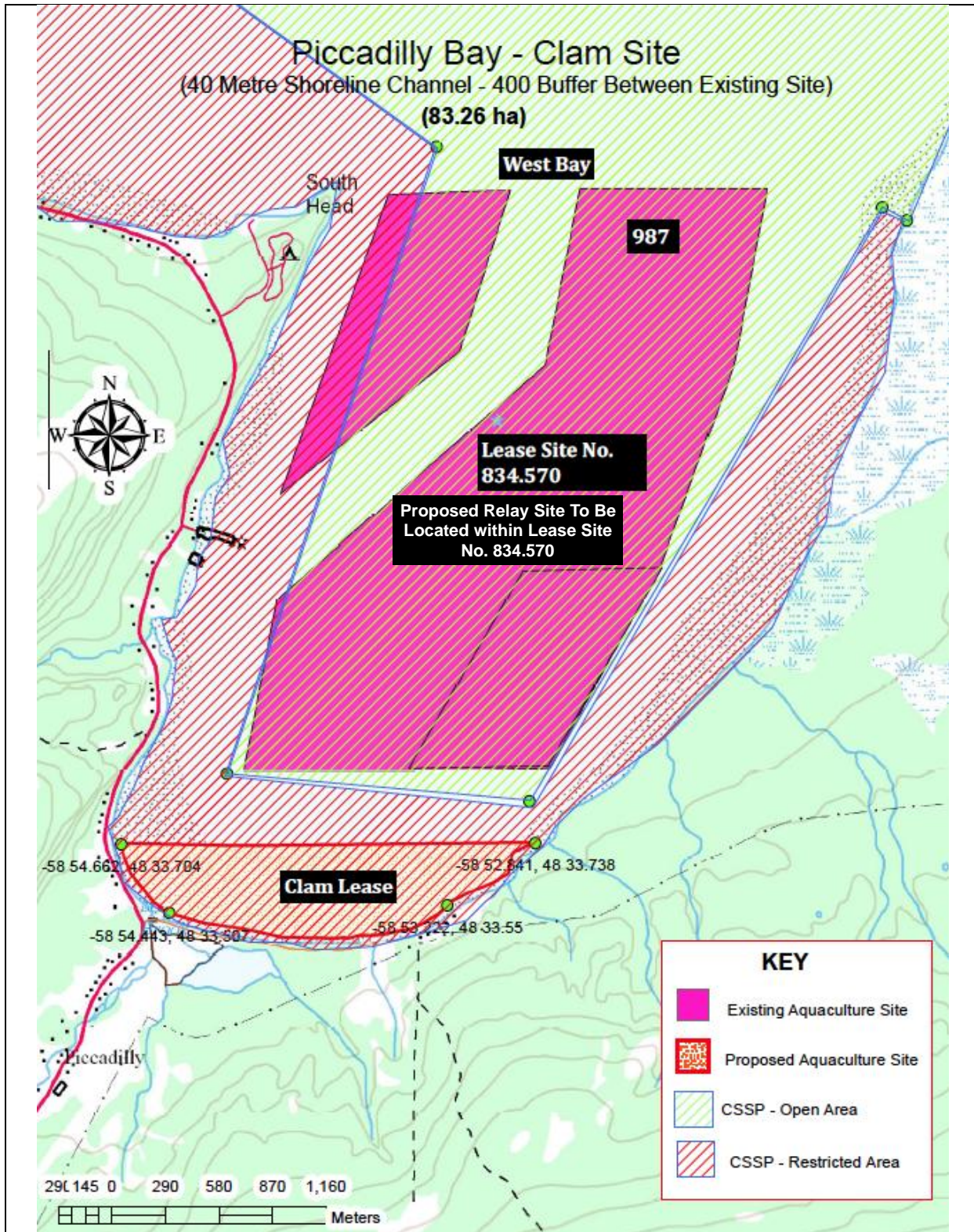


Figure 7: Advertisement

**NOTICE OF
AQUACULTURE
LICENCE APPLICATION**

TAKE NOTICE that Mills Aquaculture NL Ltd. has applied under the provisions of the Aquaculture Act for the issuance of an Aquaculture Licence to operate a Commercial Clam aquaculture facility at Stephenville Crossing, St. George's Bay, 48° 29' 47.396"N, 58° 24' 33.878"W in the Province of Newfoundland and Labrador.

Comments on this application should be directed to:

Aquaculture Licensing Administrator
Department of Fisheries
and Aquaculture
P.O. Box 679
58 Hardy Ave
Grand Falls-Windsor, NL, A2A 2K2
Tel: 709-292-4103
Fax: 709-292-4113
Email: aquaculturelicensing@gov.nl.ca

Comments must be received no later than April 4, 2015

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Endnotes:

- ¹ Landry, T. et M. Ouellette. 1993. Suivi de la pêche au râteau hydraulique sur des stocks de myes dans la baie de Miramichi, Nouveau-Brunswick - 1992. Rapp. tech. can. sci. halieut. aquat. 1921: v + 14 p.
- ² Robinson, S.M. C. & T. W. Rowell. 1990. A re-examination of the incidental fishing mortality of the traditional clam hack on soft-shell clam. *Mya arenaria* L J. Shellfish Res. 9: 283-289.
- ³ ADRA. 2003. Projet de récupération et de mise en valeur des secteurs coquilliers : analyse socioéconomique de l'exploitation de la mye dans le sud de la Gaspésie
- ⁴ Coen, L. 1995. Review of the potential impacts of mechanical harvesting on subtidal and intertidal shellfish resources. South Carolina Dept. natural Resources, Marine Resources Research Institute. 46 p.
- ⁵ Turner, S.J., S.F. Thrush, R.D. Pridmore, J.E. Hewitt, V.J. Cummings and M. Maskery. 1995. Are soft-sediment communities stable? An example from a windy harbor. *Mar. Ecol. Prog. Ser.* 120:219-230.
- ⁶ SODIM. Étude d'impact du prélèvement de myes communes (*Mya arenaria*) au moyen d'un râteau hydraulique sur la communauté benthique du banc coquillier du barachois de Malbaie. 2005. <http://www.sodim.org>
- ⁷ NOAA. Review of the Ecological Effects of Dredging in the Cultivation and Harvest of Molluscan Shellfish. NOAA Technical Memorandum NMFS-NE- 220. 2011
<http://www.nefsc.noaa.gov/publications/tm/tm220/>
- ⁸ CSSP Manual of Operations, Chapter 10: <http://www.inspection.gc.ca/food/fish-and-seafood/manuals/canadian-shellfish-sanitation-program/eng/1351609988326/1351610579883>
- ⁹ Bay St George/Port au Port Peninsula Marine and Coastal Resource Committee. Codroy Valley – Bay St. George – Port au Port Peninsula: Atlas of Significant Coastal and Marine Areas. Long Range Economic development Board, Stephenville, NL. 2011
<http://www.icomnl.ca/files/BSG%20PAP%20Atlas.PDF>
- ¹⁰ DFO Anglers Guide 2015-16: <http://www.nfl.dfo-mpo.gc.ca/NL/AG/ScheduledSalmonRivers>
- ¹¹ Chadwick, E.M.P. 1995. Water, Science and the Public: Miramichi Ecosystem. *Can. Spec. Publ. Fish. Aquat. Sci.* No. 123, 289 p.
- ¹² HRSDC. National Occupational Classification 2011:
<http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/Welcome.aspx>