FORCE
Fundy Ocean Research Center for Energy

Environmental Assessment Addendum Update

To the reports: Environmental Assessment Registration Document: Fundy Tidal Energy Demonstration Project, Volumes 1 and 2 dated June 10, 2009, and to the addendum: Environmental Assessment Addendum, dated July 22, 2010

Prepared By:
Fundy Ocean Research Center for Energy

May 4, 2015

FORCE
Fundy Ocean Research Center for Energy

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Mr. Steve Sanford
Environmental Assessment Officer
Environmental Assessment Branch
Nova Scotia Department of Environment
Suite 2085, 1903 Barrington Street
PO Box 442
Halifax, Nova Scotia B3J 2P8

RE: Amendment Request for FORCE Environmental Assessment Approval

Dear Mr. Sanford,

I wish to inform you of proposed changes to the Fundy Ocean Research Center for Energy Limited (FORCE) that may affect its Environmental Assessment (EA) approval, granted June 10, 2009 and amended July 22, 2010. Attached to this letter is an Environmental Assessment Addendum report for your review and consideration.

Recently, the Minister of Energy approved two new technologies to demonstrate their in-stream tidal energy devices at FORCE's Crown Lease Area in the Minas Passage of the Bay of Fundy. Simultaneously, the Minister also approved the revised project plans of the two existing berth holders. The four subsea berths at FORCE presently have been awarded to:

A: Minas Energy
B: Black Rock Tidal Power Inc.
C: Atlantis Operations (Canada) Inc.
D: Cape Sharp Tidal Venture Ltd.

Also under consideration at FORCE is the creation of a fifth berth site within the FORCE's existing Crown Lease Area. For purposes of this amendment request, the fifth berth would be assigned to DP Energy. Further information on these partnerships and technologies are attached to this letter.

FORCE is seeking to amend its EA approval from the four (4) single device project plans of 2010 to the five (5) small-scale demonstration arrays of devices now planned by FORCE's berth holders. While FORCE was initially approved under a joint federal/provincial EA, it is applying for an amendment under the Nova Scotia *Environment Act* due to amendments to the Canadian Environmental Assessment Agency's Project List (2012). We continue, however, to engage federal regulators in other matters relating to their jurisdiction, particularly relating to marine life and navigation.

Based on previous and ongoing environmental monitoring and effects studies at FORCE, there is not predicted to be significant adverse environmental effects originating from the new device designs and the deployment of multiple devices. Attached is an EA Addendum Report outlining the proposed changes in greater detail, as well as an overview of FORCE's environmental monitoring and community consultation activities to date.

Please do not hesitate to contact me should you have additional questions or concerns. You may reach me at 902-220-5596 or Tony.Wright@fundyforce.ca.

Sincerely,

Tony Wright
General Manager
Fundy Ocean Research Center for Energy

CC:

Joe Fitzharris, Chairman, FORCE Board of Directors
Anne-Marie Belliveau, Program Manager, FORCE Environmental Program

Contents

List of Tables and Figures

Tables

Figures

Appendices

Acronym List

ADCP – Acoustic Doppler Current Profiler

CEAA – Canadian Environmental Assessment Act

CEF - Clean Energy Fund

CLA – Crown Lease Area

DFO – Federal Department of Fisheries and Oceans

EA – Environmental Assessment

EMAC – Environmental Monitoring Advisory Committee

EEMP – Environmental Effects Monitoring Plan

EMP – Environmental Management Program

FAST – Fundy Applied Sensor Technology

FORCE – Fundy Ocean Research Center for Energy Limited

MW – Megawatt

NRCan - Natural Resources Canada

NSE - Nova Scotia Environment

RRWG – Regulatory Reform Working Group

TISEC – Tidal In-Stream Energy Convertor

1.0 Introduction

The Fundy Ocean Research Center for Energy Limited (FORCE) has constructed and now operates a tidal energy demonstration facility ('the Project') in the Minas Passage, near Parrsboro, Nova Scotia. In December 2013, FORCE received a Crown Land Lease from the Minister of Natural Resources (Nova Scotia) for the Project. Its facilities, which include the subsea Crown Land and onshore lands, provide subsea cables connecting the turbines to land-based infrastructure. The land-based infrastructure includes an onshore transformer substation, and power lines connecting its four project developers to the local power distribution system via a transmission line to the Parrsboro Substation. The berth locations are allotted in subsea berths are identified in Table 1: Present FORCE Berth Allotments and shown in Figure 1: Present locations of berths.

Table 1: Present FORCE Berth Allotments

BERTH	ENTITY
A	Minas Energy (with Marine Current Turbines and Bluewater Energy Services)
B	Black Rock Tidal Power
C	Atlantis Operations (Canada) Ltd.
D	Cape Sharp Tidal Venture Ltd.

1.1 Background

FORCE's mission is to be a catalyst to the successful growth of a global tidal energy sector. This has been part of FORCE's mandate since its inception, and has become a key enabler of the industry's development in Nova Scotia. Key to this has been the collection of a body of baseline research at the FORCE site, the establishment of its Crown Lease Area (CLA), and its Environmental Assessment (EA) Approval, all of which can reduce both risk and time for developers.

FORCE acts as a host to turbine developers, providing a shared observation facility, submarine cables, and grid connection at its pre-approved test site. Since 2010, it has completed construction of its visitors' centre, energized its infrastructure, and deployed four subsea electrical cables. Throughout this time, FORCE has utilized a series of local companies to develop this infrastructure, and to develop expertise in operating in high flow environments.

FORCE also acts as a watchdog (providing baseline studies and environmental effects monitoring); conducts applied research (with a focus on site data to better understand the environment and characteristics of the test area); and engages with industry, government, academia and the public to ensure development activity in the Bay of Fundy is safe, sustainable, and viable.

FORCE will play increasing importance in its watchdog role as devices are deployed at each of its berths over the next five years to ensure the environmental impacts of turbines is effectively understood and minimized accordingly. Key to this is FORCE's Environmental Effects Monitoring Program (EEMP), which has been in operation since 2009. An Environmental Management Plan (EMP) describes the implementation of the EEMP, as will operational and contingency plans to minimize the impacts of the Project on the environment.

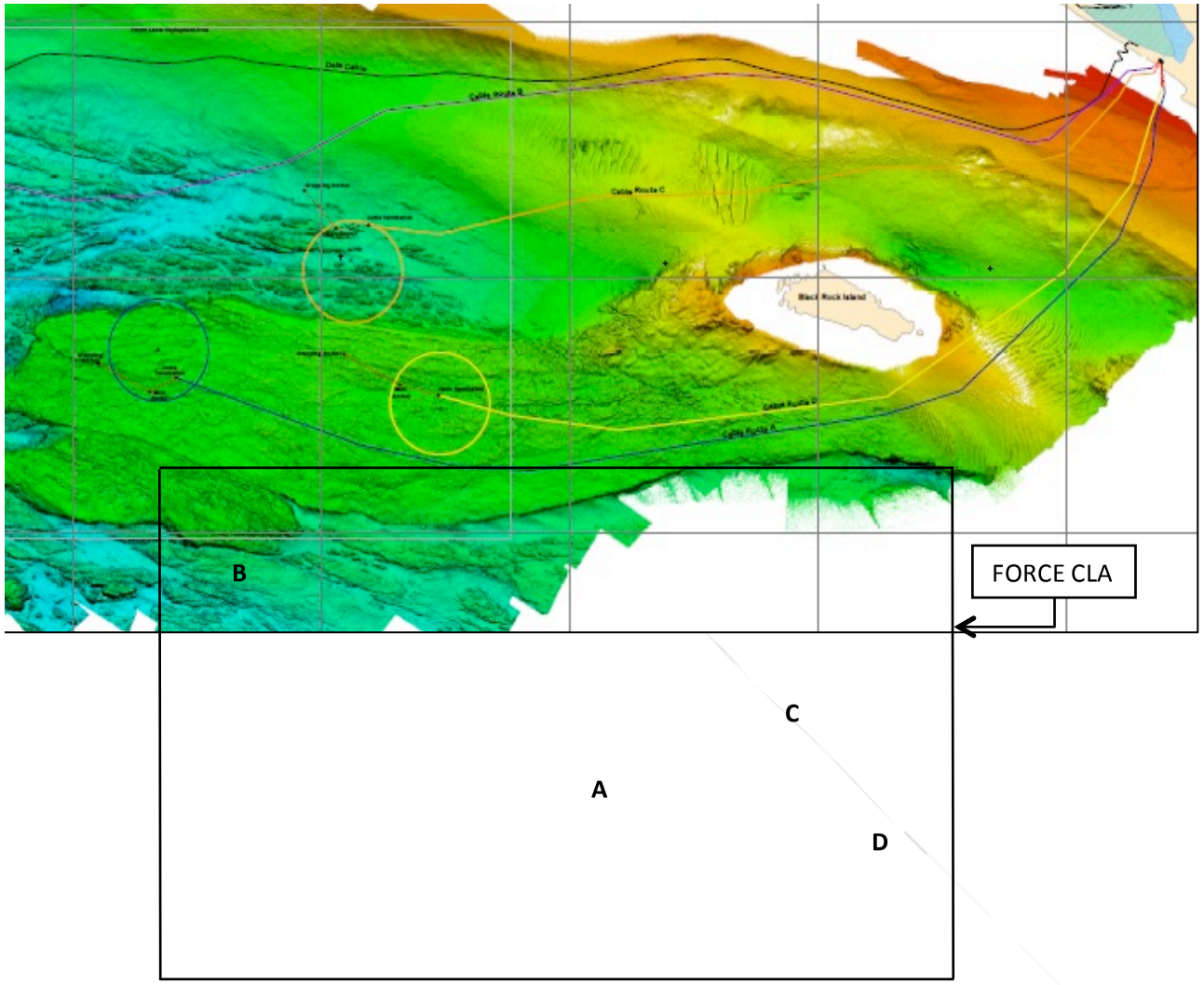

Figure 1: Present locations of berths

In addition, new tools are being developed to assist in assessing the impacts of the turbines under the FAST program. The projects within this program will enable technology innovation and development of high flow technologies and techniques, providing information on currents turbulence, marine life activity, noise levels, and seabed suitability at the hub height of the deployed turbines.

1.2 EA Background

The original 2009 EA was a joint Federal/Nova Scotia Process directed by the NS Federal / Provincial One Window Committee on Tidal Energy comprised of the relevant regulatory and permitting agencies. This joint process was established to minimize duplication between federal and NS EA processes. It was agreed that FORCE would prepare the EA Registration Document for the complete project, so that new individual berth holders would not be required to make an EA application to NS and the Federal Government. This was agreed upon as long as their tidal in-stream energy convertor (TISEC) device occupies one of the 4 existing berths in the FORCE CLA; replaces one of the turbines being tested; and, is not predicted to have significantly different environmental impacts identified under the approved EA. Each berth holder, however, is required to apply and secure all permits for their individual turbines and berth. The Project received its EA Approval on September 15, 2009.

In July 2010, FORCE submitted an EA Addendum to update Nova Scotia (mainly Nova Scotia Environment (NSE)) and Federal Departments (Fisheries and Oceans Canada (DFO) and Transport Canada (TC)) on changes to the FORCE project since the original EA Approval. The project changes included: the location of the landfall site; the construction of transmission line; and, the addition of a fourth TISEC berth and power cable. The purpose of the Addendum was to identify if there were any additional environmental impacts based on the above noted project changes. NS Environment officially responded to FORCE on July 27, 2010 indicating that no further environmental assessment was required under NS regulations at that time as they did not see the project changes, including the addition of the fourth berth, as a significant change.

In 2012, an expansion of the FORCE EA approval was selected by the Energy and Mines Ministers' Conference's 'Regulatory Reform Working Group' ('RRWG') to serve as a pilot project designed to improve alignment of federal-provincial/territorial regulatory systems. The intent was to seek approval, from both federal and provincial regulators, to amend the existing EA approval to a larger (potentially 20 megawatt (MW)) facility. In light of amendments to the *CEAA* (2012) Project List, the proposed expansion of the FORCE facility no longer fell under federal jurisdiction, therefore, removing the FORCE project from the RRWG.

1.3 Present request

FORCE is proceeding with requesting the approval of a **second EA addendum** from the NSE EA branch. This EA Addendum Report is organized to describe the changes to the Project and to reflect the process by which the assessment of the changes has been conducted:

- Section 2.0 describes the nature of the changes to the Project from what was originally proposed and approved in 2009 and 2010.
- Section 3.0 describes the community and stakeholder engagement conducted to date and plans for future engagement by FORCE to-date regarding the proposed changes to the Project.
- Section 4.0 provides the results of the ongoing environmental effects monitoring for the valued environmental components which may be affected by the Project changes and identified in the original EA Registration Document.

FORCE has continued to collect and assess background environmental data in the Minas Passage and is presently designing an updated Environmental Effects Monitoring Program to be implemented in 2015 prior to the next TISEC deployment.

2.0 Environmental Assessment Approvals

2.1 Original Environmental Assessment Approval (2009)

On June 17, 2009, Minas Basin Pulp and Power Co. Ltd., on behalf of FORCE, registered the Project Fundy Tidal Energy Demonstration Facility in the Minas Passage for Environmental Assessment (EA), in accordance with Part IV of the *Environment Act*. The Project was assessed under a joint federal/provincial EA review process and was subject to federal and provincial environmental approval in accordance with the following legislation:

1. *Canadian Environmental Assessment Act* (CEAA): pursuant to Section 5(1)(d) of CEAA, Fisheries and Oceans Canada and Transport Canada were required to issue permits to enable the Project to proceed; and
2. *Environmental Assessment Regulations* (Nova Scotia): pursuant to Schedule A of the provincial regulations under the *Environment Act*, registration as a Class 1 Undertaking was required.

The Project received its EA Approval on September 15, 2009. FORCE was, and is, required to meet Terms and Conditions outlined in the EA approval as provided by Nova Scotia Environment (NSE). FORCE has met all of the Conditions outlined in the EA approval. Some items are ongoing, based on activities at the FORCE site.

The original scope of the Project, as outlined in the Environmental Assessment Registration Document dated June 2009, and given EA approval on September 15, 2009, was for FORCE to construct, operate, and decommission a 'Tidal Energy Demonstration Facility' with the following objectives:

- To build and operate a test centre to test the commercial potential of in-stream tidal energy devices;
- To acquire information to assess the performance of these devices/turbines, including environmental impacts; and
- To develop monitoring techniques and methodologies for these in-stream tidal energy devices/turbines.

At the time of the approval, three turbines were approved for deployment with the expectation each would be deployed for a period of one (1) to four (4) years prior to removal. The intent of the Project was to address the potential impacts associated with the short-term deployments of the three turbines listed in Table 2: Original Devices Scheduled for Deployment.

Table 2: Original Devices Scheduled for Deployment

DEVICE	DEVICE DESCRIPTION
Clean Current Power Systems	2.2 MW shrouded turbine with a gravity base
OpenHydro	1.0 MW shrouded turbine with a gravity base
Marine Current Turbines	1.2 MW device drilled into a subsea foundation with a surface piercing component

Under the EA Approval, the Project was subject to a number of Terms and Conditions including: Operation and Decommissioning; Environmental Effects Monitoring; Wetlands, Wildlife and Habitat; Surface Water Protection; Public and Stakeholder Consultation; Archaeological and Cultural resources; and, Accidents and Malfunctions.

2.2 Environmental Assessment Addendum (2010)

In 2010, FORCE submitted an EA Addendum Report dated July 22, 2010, to reflect changes in the Project since the original EA Approval was issued. These changes included a revised location for the landfall portion of the project, the addition of a fourth berth and subsea electrical cable, and construction of a transmission line. At this time, the new turbine design for the fourth berth had not been selected, but was anticipated to be similar to others previously approved and, therefore, did not warrant a reassessment of in-stream tidal energy technologies.

In addition, federal funding was received from Natural Resources Canada (NRCan) under the Clean Energy Fund (CEF) in January 2010. In accordance with the Canadian Environmental Assessment Act (CEAA), NRCan required FORCE to conduct a screening level environmental assessment review prior to releasing the funds in relation to the infrastructure changes including the transmission line and visitor centre.

As noted under Section 1, NSE determined that no further environmental assessment work was required in relation to FORCE's EA Addendum request, but that the project was subject to the Terms and Conditions of the original EA Approval. NRCan approved the screening in February 2011 with no additional conditions related to the marine FORCE demonstration area. The terrestrial conditions in the approval related to the addition of the Transmission Line. FORCE also committed, in addition to having an archaeologist on site, to informing the First Nations in advance, and inviting their participation, of any excavation where there is the potential for the discovery of historical and/or First Nations artifacts.

3.0 Environmental Effects Monitoring Program

One of the conditions of FORCE's EA was to develop and implement an environmental effects monitoring program (EEMP). The program was stipulated to be developed and implemented in consultation with the project Environmental Monitoring Advisory Committee (EMAC), which was established in 2009. EMAC is an independent advisory committee comprising volunteer members from academia, First Nations, the local fishing community, who makes recommendations to FORCE on its monitoring program. The committee also has observers from FORCE and its berth holder companies.

It should be noted that the EEMP is focused on the marine environment, and does not include monitoring programs related to the terrestrial part of the FORCE Project, as these programs (i.e. wetlands, birds and wildlife and archaeological issues) are conducted and reported on under specific provincial approvals such as Wetlands Alteration, Watercourse Alteration, and Cultural and Heritage Research permits.

3.1 EEMP Activities To-Date

FORCE's EEMP was initiated in September 2009, in anticipation of the deployment of the first tidal turbine installed at the site by Nova Scotia Power Inc. (NSPI) / OpenHydro (OH) on November 12, 2009. The EA stated that the EEMP shall consider fish, lobster, marine birds, marine mammals, acoustics, physical oceanography, currents and waves, and benthic environment. Studies conducted on these parameters to date have been summarized in two reports: FORCE's Environmental Effects Monitoring Report – September 2009 to January 2011, and FORCE Environmental Effects Monitoring Report – 2011 to 2013. Both of FORCE's EEMP reports are found on FORCE's website: http://fundyforce.ca/environment/monitoring/.

Although the EEMP is a work in progress, the studies and reviews over the past few years have added to the body of knowledge regarding the Minas Passage environment and potential monitoring protocols. FORCE recognizes that additional studies are required as part of the "adaptive management" approach - a strategy recommended in FORCE's Environmental Management Plan (EMP) and adopted by the Department of Fisheries and Oceans (DFO).

3.1.1 Environmental Monitoring Report – September 2009 to January 2011

This report summarized the studies conducted by 3rd parties from the initiation of FORCE's EEMP in September 2009 to January 2011. The EEMP covered the early development of the project including the deployment of the first tidal turbine installed at the site by Nova Scotia Power Inc. (NSPI)/OpenHydro (OH) from November 12, 2009 until December 14, 2010.

The Environmental Effects Monitoring Program focused on monitoring the effects of the marine environment of installation, operation, and removal of turbines and cables. Components of the EEMP were proposed in the Project's EMP, and approved in principle by DFO and NSE. The final EEMP was modified based on advice from FORCE's EMAC.

An “adaptive management” approach was used in implementing the EEMP, that is, one that reviewed the activities and outcomes continuously and modified them periodically to reflect new information as well as the results of assessments of outcomes relative to objectives. Regulators, and EMAC, recognized the novel and exploratory nature of many of the monitoring activities, since the Minas Passage is a unique environment which presents challenges for monitoring due to its high currents and tidal range. Most of the monitoring approaches used for the EEMP, although often derived from conventional protocols, were applied for the first time in the challenging environment of Minas Passage.

The NSPI/OpenHydro turbine was installed successfully with no environmental impacts observed for the process. Monitoring equipment mounted on the turbine recorded engineering parameters for the turbine, and made physical oceanographic measurements, including currents, for about three weeks before the devices eventually failed on December 4, 2009. Subsequently, the turbine remained in place for over one year, during which turbine blades and some instrument 5 modules were lost. Presence of the structure at the site for over a year, as well as the subsequent recovery operation, provided an opportunity for several of the monitoring studies to look for environmental impacts. No adverse environmental impacts were observed.

In summary, the EEMP over the period of 2009 to 2011 collected useful information, both focused on determining possible impacts of the tidal turbine, as well as on obtaining background environmental data for the Minas Passage. The studies provided the opportunity to investigate the application of a variety of monitoring approaches and technologies in the challenging Minas Passage environment, and the knowledge gained from the studies were employed in projects undertaken in the future EEMP for the Project.

3.1.2 Environmental Monitoring Report –2011 to 2013

The EEMP continued through 2011-2013 in spite of an absence of turbines, with studies focused on collecting background data and investigating monitoring approaches and technologies for use in high-flow environments that could be employed for future EEM programs at the FORCE site. This report summarized studies conducted by 3rd parties to collect baseline information that will be used with current and future studies to address environmental effects of turbines installed at FORCE.

This report provided a detailed summary of the studies, including goals/objectives, description and the key findings. The findings are those of the study authors/investigators, as is any interpretation or analysis. The studies included monitoring and research activities on seabirds, marine mammals, lobster and fish tracking and movements, marine acoustic environment, benthic habitat and electromagnetic fields (EMF). As in previous years, the difficulties of monitoring in a high flow environment challenged the consultants undertaking the studies.

3.1.3 R&D

FORCE is fortunate to have a Research Program, with one of its goals being to advance technology innovation in high flow environments. FORCE’s Fundy Advance Sensor Technology (FAST) program is building sensor platforms which instrument manufacturers, data processors and marine operators will

benefit from. Since the construction, and initial (until more funding is granted) deployments and recoveries of the platforms are funded, this will foster innovation and development that would not otherwise be realized due to the high costs associated with testing instruments in the Bay of Fundy.

The FAST platforms continue to provide unprecedented testing opportunities to systematically evaluate and modify instruments to best measure the Bay of Fundy tidal flow, and ultimately achieve two of FORCE's main objectives: 1. to identify, characterize, and monitor high flow tidal sites; and 2. to evaluate and monitor the interaction of tidal turbines with the Bay of Fundy environment. More information is available at www.fundyforce.ca/environment.

3.2 FORCE's New EEMP

FORCE is presently working to develop a new EEMP in anticipation of the next turbines being deployed at FORCE. FORCE, in consultation with EMAC, issued an RFP (which was developed with EMAC) to hire an external consultant to develop the new EEMP. SLR Consulting (Canada) Ltd. (SLR) was awarded the project, after a panel review including EMAC and FORCE members. SLR was tasked with reviewing all relevant document, both locally and internationally, engaging with EMAC, local experts, regulators, fishers and First Nations in order to develop the EEMP. The new EEMP will take into account all lessons learned from studies conducted to date at FORCE, and will be structured using the "adaptive management" approach, so that it can be amended as new lessons are learned moving forward. The new EEMP will be finalized and implemented prior to the next turbine being installed at FORCE in the fall of 2015. The draft of FORCE's new EEMP will provided via CD.

It was anticipated that the berth holders' would be responsible to conduct near-field and/or at the turbine environmental monitoring. This requirement was to be enforced and approved in their permit issued by DFO. In recent meetings, DFO has indicated that they will most likely not (at this time) be issuing permits, but rather a Letter of Advice. FORCE recognizes that this monitoring is critical, therefore it will be amending its EMP to indicate that this near-field monitoring shall be conducted by the berth holder, and their monitoring plan shall be first reviewed by a sub-committee of FORCE's EMAC, and then approved by either NSE and DFO (if a DFO permit is enforced), otherwise solely by NSE.

4.0 Consultation and Engagement Activities

FORCE has been actively consulting and engaging with stakeholders since it was established in 2009. Prior to then, Minas Basin Pulp and Power, who was the original Proponent of the project, proactively conducted engagement with stakeholders beginning in 2008.

Although, public consultation is not a requirement of a Class 1 EA for the Province of Nova Scotia or a Screening Level EA under CEAA, the Project recognized that the engagement and consultation of the public and stakeholders as early as possible is important part of the process.

So very early in the process, a commitment was made to the ongoing timely engagement of all stakeholders at the pre-engagement stage (prior to the SEA decision) and after the SEA decision. This effort included numerous presentations, mall focused stakeholder meetings in both Parrsboro and

Woflville, a major community open house, meetings with fishers, and First Nations (Assembly of NS Mi'kmaq Chiefs) and the Native Council of Nova Scotia. In addition, a Stakeholder Liaison Committee and Fishers Contact Committee were established to gain insight to both community and fisheries issues and concerns.

Since the EA Approval, FORCE has continued to actively update and engage governments, the public and stakeholders such as fishers and First Nations.

4.1 Consultation Activities to Date

4.1.1 Government

FORCE has consulted with the applicable government departments who are stakeholders in the project, both provincially and federally, since FORCE was created. Individual meetings were first held, until the NS One Window Committee on Tidal Energy was established in 2008. The NS Department of Energy is the chair of the committee. The Committee has operated under mutual agreement on an *ad hoc* basis without specific terms of reference; however, NS Department of Energy is working to formalize the Committee in anticipation of increased industry activity, but main objectives were to coordinate EA processes and minimize duplication of efforts by both governments and proponents. The NS Department of Energy coordinates communications in between meetings, and representatives include:

Provincial:

- Economic and Rural Development and Tourism
- Environment
- Fisheries & Aquaculture (Coastal Secretariat)
- Labour & Advanced Education (OHS Division)
- Natural Resources
- Office of Aboriginal Affairs

Federal:

- Aboriginal Affairs & Northern Development Canada
- Atlantic Canada Opportunities Agency (Atlantic Energy Office)
- Canadian Environmental Assessment Agency
- Environment Canada
- Fisheries and Oceans Canada
- Major Projects Management Office
- Natural Resources Canada
- Transport Canada

FORCE and the berth holders are now periodically invited to provide project updates to the Committee and receive feedback. FORCE also continues to engage with individual departments on specific matters.

4.1.2 Public Stakeholders

FORCE has conducted and/or participated in numerous public meetings organized by itself and/or its members to discuss updates on the various projects and at the FORCE site. Many of these meetings have been held in Parrsboro to date.

FORCE has also either been a part of, or subject to discussions arising from, Government consultations on marine renewable energy in Nova Scotia since 2008. This includes public consultation activities through the Strategic Environment Assessment conducted in 2008, though until its update in 2013-2014

by the Province of NS. The assessment was designed to describe the current state of knowledge regarding the tidal energy industry and summarize stakeholder public opinion and views concerning the social, economic, and environmental issues related to commercial tidal development in the Bay of Fundy region.

As part of the Terms and Conditions of the EA Approval, FORCE established the Community Liaison Committee (CLC) and the Environmental Monitoring Advisory Committee (EMAC). The CLC is a community based committee including members from the general public, fishers and First Nations and is intended to keep the community updated on FORCE project activities. As well it provides an opportunity for questions and feedback from the community regarding the project. EMAC is an independent advisory group composed of representatives from academia, scientific community, fishers and First Nations and provides advice to FORCE on the design and implementation of its EEMP.

In addition, the FORCE visitors' centre has seen an increase in visitors since it opened in 2012. The center houses interpretive exhibits, interactive displays, a small theatre/community room, as well as space for onsite meetings and research work. In 2014, it welcomed more than 5,200 visitors.

4.1.3 First Nations

FORCE has been engaging with First Nations prior to the SEA decision in 2008. Minas Basin Pulp and Power began the engagement activities in 2008, and then FORCE continued the engagement with First Nations once it was established through various avenues:

- Completion of a Mi'kmaq Ecological Knowledge Study (2009)
- Presentations to Assembly of NS Mi'Kmaq Chiefs (2008 and 2014)
- Provision of FORCE's 2009 EA Project Description and 2010 EA Addendum
- Invitation to Fishers Meetings and invitation to join FORCE's Fisher's Contact Committee (established in 2008). The Committee dissolved due to lack of interest; however FORCE is in the process of re-establishing this group as the FORCE Fisher Liaison Group and have invited First Nations to join (see next section).
- Membership on FORCE's EMAC since 2009. For more details see http://fundyforce.ca/about/advisory-committees/.
- Membership on FORCE's Community Liaison Committee (CLC) since 2009. For more details see http://fundyforce.ca/about/advisory-committees/.
- Presentations to the Nova Scotia Federal/Provincial One Window Committee on Tidal Energy, of which the Provincial Office of Aboriginal Affairs and Federal Department Aboriginal Affairs & Northern Development Canada have representation.
- Emails, phone calls and one-on-one meetings with Nova Scotia Native Council, Kwilmu'kw Maw-klusuaqn (KMKNO or Mi'kmaq Rights Initiative) and Mi'kMaq Conservation Group staff or representatives.

The KMKNO has been the main point of contact between FORCE and the First Nations. For more details of FORCE's Engagement with First Nations, please refer to the FORCE Mi'Kmaq First Nations Consultation & Collaboration Report located in Appendix F.

4.1.4 Fishing Community

Local fishers have been involved with the project prior to its inception. Local fishers were included in the original boat trips to help identify the best location for the project CLA.

As indicated above, fishers have continuously had project updates through their representatives on FORCE's EMAC and CLC since 2009.

Minas Basin Pulp and Power established the Fishers Contact Committee in 2008. This committee was established as a means of disseminating information about the project. The committee became inactive after the CLC and EMAC were established.

Two fisher consultation meetings were held in Truro at the start of the project in 2009. Broader Fishers meetings have been held on an ad hoc basis since the Fishers Contact Committee became inactive. A Fishers Meeting was held on December 16, 2014 to provide a project update and to discuss a proposed safety zone around its subsea cables and turbine berths. The zone would help protect people, cables, monitoring equipment and fishing gear from harm. A second meeting was held on April 14, 2015. Another project update was provided, and the Safety Zone was again discussed. Numerous concerns were presented to FORCE at the meeting, as outlined in Appendix G: Summary of Discussion from the April 14, 2015 FORCE Fishers Meeting. FORCE also asked for feedback regarding its proposed Safety Zone around its cables, to be provided back to FORCE by April 30, 2015.

Both the fishers and FORCE agreed to re-establish a Fishers group for information transfer. FORCE has established the FORCE Fishers Liaison Group, which will disseminate information about the project and address comments or concerns via email and semi-annual meetings.

4.2 Future Engagement

FORCE is developing a new Communications Plan, which includes its Stakeholder Engagement strategy. Highlights of the strategy include:

- FORCE intends to conduct Public meetings in the spring of 2015 at various locations around the Bay of Fundy to provide project updates.
- FORCE will continue to engage with First Nations and fishers through its CLC, EMAC, Fishers Liaison Group, and direct contact with representatives.
- FORCE's Fisher Liaison Group will disseminate information to its members via email and semi-annual meetings.

FORCE will collaborate with the province and developers on their stakeholder engagement plans to ensure that all parties are aware of each others' plans.

5.0 Project Amendments

Since the 2009 EA Approval and the subsequent 2010 Addendum, considerable progress has been made regarding the Project: the onshore transformer and substation have been constructed, a visitors' centre has been built and operational, four subsea cables and one data cable have been deployed and connected to underground vaults. Additional activities conducted by FORCE are outlined in Sections 3.0: Community Consultation Activities and 4.0: Environmental Effects Monitoring Plan.

As the tidal energy sector continues to advance globally, FORCE's adaptive management approach to the Project will support it to remain globally competitive and to continue to contribute to the global body of knowledge surrounding in-stream tidal energy. Recognizing the opportunities of the Project, the Province provided $4.2 million funding to FORCE in March 2014 to increase its electrical capacity to 30MW. The detailed design of these upgrades is underway.

The following sections outline the changes FORCE is proposing to the Project.

5.1 Deployment of Arrays

Since its inception, the Project was designed for the short-term deployments of single devices/turbines. Evolution in the global industry, however, has resulted in an increased interest by proponents to seek sites that can host small arrays of turbines (i.e., one to three devices per berth), rather than individual sites for demonstration of their technologies which has been completed elsewhere (in jurisdictions such as Scotland, Ireland, and France).

As such, there is a strategic opportunity for FORCE to be the demonstration site to the first grid-connected array in the world. Since the deployment of subsea power cables, berth holders at the site have expressed an interest in deploying small-scale arrays to increase their understanding of:

- How to connect two devices to a single subsea power cable;
- The ideal spacing between turbines to reduce or limit wake effects and reduce turbulence; and
- The interaction of turbines with one another and impacts on efficiency, power output, etc.

All proposed deployments have been approved by the Minister of Energy; berth holders at berths A through D have received a Developmental Tidal Array Feed-in Tariff approval from the Minister of Energy for their projects. DP Energy will receive approval upon approval of the amendments to FORCE's EA, upon approval by FORCE's Board of Directors, and upon finalization of the location of Berth E.

5.2 New Technologies

In-stream tidal energy technologies are still relatively immature, and as a result, there has been little to no technology consolidation (i.e., optimal designs have yet to be established). In addition, since 2009, new designs have been proposed, new companies have entered the sector, and the size and scale of technologies has typically increased. As such, new technologies have been approved by the Minister of Energy to proceed at the FORCE site.

While the technologies proposed at the FORCE site vary, all may be classified as a 'horizontal axis TISEC' (Tidal In-Stream Energy Convertor) as the axis is parallel to the sea surface and current flow direction. These turbines closely resemble the energy extraction mechanism of modern wind turbines, where they extract energy from moving water similar to how wind turbines extract energy from air currents. Table 3: Devices Scheduled for Deployment 2015+ outlines, in high-level detail, descriptions of the devices approved by the Minister of Energy to be deployed at the FORCE site. A general description of the various technologies to be deployed is found below. More detailed device specifications may be found in the Appendices to this Addendum Report.

Table 3: Devices Scheduled for Deployment 2015+

BERTH	ENTITY	DEVICE	DEVICE DESCRIPTION	PROPOSED DEPLOYMENT CAPACITY
A	Minas Energy			
B	Black Rock Tidal Power			
C	Atlantis Operations (Canada) Ltd.			
D	Cape Sharp Tidal Venture Ltd.	OpenHydro turbines	2 shrouded, bottom mounted turbines of 2.0 MW each	4.0 MW
'E'	'DP Energy"			

5.2.1 Minas Energy

5.2.2 Black Rock Tidal Power Ltd.

5.2.3 Atlantis Operations (Canada) Inc.

5.2.4 Cape Sharp Tidal Venture

Design will use a bottom mounted shrouded turbine. The turbine will be open-centered and have a 16 m diameter, capable of 2.0 MW. The turbine position will remain fixed. The general design is similar to what was previously deployed at FORCE but larger and much more robust. In an array, devices would be at least 80 m apart.

5.2.5 DP Energy

5.3 Creation of a Fifth Berth

In November 2014, the Minister of Energy announced that the Province is in discussions with Ireland-based renewable energy development company DP Energy regarding adding a 5th berth (E) at FORCE. DP Energy submitted a proposal in response to the Provincial Request for Proposals for tenancy at FORCE

which closed on December 16, 2013 (RFP No. 60144876). While not successful (two berths were awarded as a result of this process—one to Cape Sharp Tidal Venture, the other to Black Rock Tidal Power), DP Energy's proposal was of good quality and was ranked third. The RFP made the following provision to allow the Minister to award additional berths without proceeding with further procurement processes: "The Province reserves the right to award additional contracts to proponents who respond to this RFP should additional berth(s) become available in Nova Scotia."

FORCE is looking to seek a high level Board approval to add a 5th berth at FORCE prior to proceeding with working with DP Energy to identify the location of a fifth berth ('Berth E') within FORCE's present CLA Should the 5th berth be approved, and the location of the fifth berth be identified, FORCE's Board would have to formally approve the location. DP Energy will then incur the costs of interconnection (including installing their subsea cable and onshore electrical infrastructure).

5.4 Revised Timelines

Given the evolving nature of this industry, timelines for deployments too have evolved. The Province expects the first deployments to occur by end 2015—Cape Sharp Tidal Venture will be deploying its two 2.0 MW turbines. This deployment will be followed by successive deployments by other berth holders (DP Energy at berth E is excluded until such a time that a berth location is finalized). Table 4: Scheduled Deployment Dates for FORCE Berth Holders outlines, in chronological order, the approved deployments at the FORCE site.

Table 4: Scheduled Deployment Dates for FORCE Berth Holders

YEAR	ENTITY	BERTH	CAPACITY TO BE INSTALLED
2015	Cape Sharp Tidal Venture Ltd.	D	4.0 MW

6.0 Summary

The Project has been constructed and currently operates in accordance with applicable legislation, permit/approval conditions, and accepted industry best practices. FORCE, its berth holders, and contractors will continue to be proactive in planning, implementing and adapting it EEMP and its procedures to prevent pollution and negative impacts on the environment and ecosystem, and will continually manage environmental issues as a priority.

Appendix A. Minas Energy Device Specifications

Appendix B. Black Rock Tidal Power Inc. Device Specifications

Appendix C. Atlantis Operations (Canada) Inc. Device Specifications

Appendix D. Cape Sharp Tidal Venture Ltd. Device Specifications

Appendix E. DP Energy Device Specifications

Appendix F. FORCE Mi'kMaq First Nations Consultation & Collaboration Report (2014)

Appendix G. Summary of Discussion from the April 14, 2015 FORCE Fishers Meeting