

# MARINE RENEWABLE-ENERGY PERMIT

# **Province of Nova Scotia**

#### Marine Renewable-energy Act

**PERMIT HOLDER:** 

Sustainable Marine Energy (Canada) Ltd.

**PERMIT NUMBER:** 

<u>2018-004</u>

EFFECTIVE DATE:

LAST AMMENED ON:

**EXPIRY DATE:** 

DEC 1 8 2019 December 31, 2020

September 14, 2018

Pursuant to section 38 of the *Marine Renewable-energy Act* a Permit granted to the Permit Holder is subject to the Terms and Conditions attached to and forming part of this Permit, for the following activity:

Construction, installation, operation and decommissioning of an unconnected generator with an aggregate nameplate capacity of two-hundred and eighty (280) kilowatts at Sustainable Marine Energy (Canada) Ltd. Permit Area within the Fundy Area of Marine Renewable-electricity Priority.

DEC 1 8 2019

Derek Mombourquette Minister

**Date Signed** 



# MARINE RENEWABLE-ENERGY PERMIT

#### **Province of Nova Scotia**

#### Marine Renewable-energy Act

PERMIT HOLDER:	Sustainable Marine Energy (Canada) Ltd.
PERMIT TYPE:	Unconnected Generator
PERMIT NUMBER:	<u>2018-004</u>
EFFECTIVE DATE:	September 14, 2018
LAST AMMENDED ON:	DEC 1 8 2019
EXPIRY DATE:	December 31, 2020

#### **Terms and Conditions of Permit Approval**

This approval is subject to the following conditions and obtaining all other necessary approvals, permits or authorizations required by municipal, provincial and federal acts, regulations and by-laws before constructing, installing, operating and decommissioning any device in the Sustainable Marine Energy (Canada) Ltd. Permit Area.

The following schedules are attached to and form part of this Permit:

- Schedule "A" Survey of Sustainable Marine Energy (Canada) Ltd. Permit Area;
- Schedule "B" The Project Description submitted by Sustainable Marine Energy (Canada) Ltd. in their Application Document;

#### **Definitions:**

"Application Document" means the complete marine renewable-energy permit application submitted by the Permit Holder to the Nova Scotia Department of Energy and Mines on July 6, 2018;

"Sustainable Marine Energy (Canada) Ltd. Permit Area or Permit Area" means the area of submerged land for which the specific location has been determined by survey by the Permit Holder as described in the Application Document, and is contained in Schedule "A" of this Permit;

"Decommissioning, Abandonment and Rehabilitation Plan" means the decommissioning, abandonment and rehabilitation plan required by subsection 44(2) of the *Marine Renewable-energy Act* and provided to the Minister in accordance with sections 19 and 20 of the *Marine Renewable-energy General Regulations*;

"Deployment" means the placement of a device or associated equipment in position ready for use;

"Device(s)" means a tidal in-stream energy conversion device that is intended to generate electricity from in-stream tidal energy;

"Effective Date" means the date that this Permit is effective, as noted at the head of this document;

"Fee Regulations" means the Marine Renewable-energy Fees Regulations;

"Minister" means the Minister of Energy and Mines for the Province of Nova Scotia;

"MReA" means the Marine Renewable-energy Act;

"Permit Holder" means Sustainable Marine Energy (Canada) Ltd.;

"Program Administrator" means a representative of the Nova Scotia Department of Energy and Mines who has been assigned to receive information on the Department's behalf with respect to this Permit;

"Prototype Assembly" means the generator(s) described in the Project Description, together with all protective and other associated equipment and improvements as may be modified from time to time pursuant to the terms of this Permit;

"Regulations" means the Marine Renewable-energy General Regulations;

"Regional Biologist" means a representative of the Nova Scotia Department of Lands and Forestry who has been assigned to receive information on the Department's behalf with respect to reporting required under Article 5.7 of this Permit;

"Risk Management Plan" means written plan prepared in accordance with section 18 of the *Marine Renewable-energy General Regulations* for identifying, assessing, managing and mitigating risks associated with actions to be carried on under a permit;

"Socio-economic Matters" include, but are not limited to, issues relating to employment, job-creation, and community relations;

"Project Description" means the description contained in Schedule "B" of this Permit;

#### 1.0 Scope of Approval

- 1.1 The Permit approval for the project is limited to the project as described in the Application Document and Schedule "B" of this Permit.
- 1.2 The Permit approval for the project is limited to the technology as described in the Application Document and Schedule "B" of this Permit.
- 1.3 The Sustainable Marine Energy (Canada) Ltd. Permit Area is 5.94 hectares and is described in the Application Document and Schedule "A" of this Permit.
- 1.4 Nothing contained in this Permit shall remove any process, requirement, or obligation on the Permit Holder to comply with the MReA, the Regulations and the Fees Regulations.
- 1.5 In the event of a conflict between the terms and conditions of this Permit and the MReA, Regulations, or Fee Regulations (collectively referred to as the "MReA regime"), the MReA regime shall prevail.

# 2.0 General Terms and Conditions

- 2.1 Subject to consultation and any other requirements, the Minister may, upon receiving an application from the Permit Holder, extend this Permit for one or more terms, as long as the aggregate of the initial term of the Permit and any extensions of the Permit not exceed ten (10) years pursuant to Section 11 of the Regulations.
- 2.2 If the Minister determines that there has been non-compliance with any or all terms and conditions in this Permit, or the MReA regime, the Minister may suspend or revoke the Permit pursuant to Sections 48 of the MReA.
- 2.3 Despite an expiry, suspension, or revocation of this Permit, the Permit Holder remains subject to the penalty provisions and any continuing obligations as stated in the MReA and Regulations.
- 2.4 The Permit Holder shall ensure that this Permit, or a copy, is kept at the Nova Scotia offices of the Permit Holder at all times and that personnel directly involved in the maintenance and operation of the cables and associated equipment are made fully aware of the terms and conditions pertaining to this Permit and the MReA regime.

# 3.0 Rent Payments

- 3.1 The Permit Holder shall pay the first annual rent payment of \$721.00, prior to Deployment, and \$481.00 on or before January 31, 2019. The rent payment is calculated on the basis of a calendar year and is equal to \$48.08 for every week of the Permit.
- 3.2 Rent payments shall be made payable to the Minister of Finance and are non-refundable.
- 3.3 If rent is not paid on or before the deadline for payment, the Permit Holder shall pay an additional late fee in an amount equivalent to 10% of the amount that was not paid on or before the deadline.
- 3.4 The Permit Holder shall notify the Minister in writing if they believe their rental fees are changing and submit to the Minister updated project information sixty (60) calendar days before the next year's rent payment is due.

# 4.0 Operating and Decommissioning

- 4.1 This Permit is valid for a term of six (6) months from the Effective Date of this Permit, as noted at the head of this document.
- 4.2 The Permit Holder must submit a decommissioning, abandonment and rehabilitation plan to the Minister for approval prior to constructing or installing a generator, cable or other equipment or structure in the Sustainable Marine Energy (Canada) Ltd. Permit Area.

### 5.0 Environmental Monitoring Plan

- 5.1 The Permit Holder shall not install any generator, including any cable or any other equipment or structure owned by the Permit Holder and used or intended to be used with the generator, before submitting an Environmental Monitoring Plan (EMP) to the Minister for approval prior to Deployment.
- 5.2 The EMP shall contain all the information listed in section 16 of the Regulations.
- 5.3 The Permit Holder shall update and revise the EMP as required by the Minister throughout the term of this Permit.
- 5.4 The Permit Holder shall comply with the approved EMP.
- 5.5 The Permit Holder shall submit an initial status report on environmental monitoring equipment functionality to the Program Administrator prior to turbine operation.
- 5.6 Environmental effects monitoring reports shall be submitted in writing to the Minister at a schedule to be determined by the Nova Scotia Department of Energy and Mines following the receipt of all other necessary environmental approvals.
- 5.7 The Permit Holder shall notify the Program Administrator, the Regional Biologist and the Department of Fisheries and Oceans Canada at 1-800-565-1633, within twenty-four (24) hours upon knowledge of any and all injury or mortality to marine mammals, fish, marine invertebrates, and marine birds throughout the term of this Permit.

## 6.0 Engagement Requirements

- 6.1 Prior to Deployment the Permit Holder must submit to the Minister for approval, an engagement plan outlining ongoing and proposed engagement and discussion activities with the Mi'kmaq of Nova Scotia, which are to include dissemination of the results of environmental monitoring activities. The plan shall include a description and general schedule for these activities. The plan must be updated and resubmitted annually to the Minister for approval on or before January 31<sup>st</sup> throughout the term of this Permit.
- 6.2 Prior to Deployment the Permit Holder must submit to the Minister for approval, a stakeholder communication and engagement plan outlining ongoing and proposed engagement and discussion activities, including dissemination of the results of environmental monitoring activities. The plan shall include a description and general schedule for these activities. The plan must be updated and resubmitted annually to the Minister for approval on or before January 31<sup>st</sup>, throughout the term of this Permit.
- 6.3 The Permit Holder shall support the Province of Nova Scotia in its future and ongoing consultation processes with the Mi'kmaq of Nova Scotia, share information, the Minister considers necessary or advisable, with the Mi'kmaq of Nova Scotia, and consider implementing mitigation and accommodation measures to address any issues raised through consultation.

#### 7.0 Reporting Requirements

- 7.1 The Permit Holder shall notify the Program Administrator prior to the Deployment or testing of Device(s) or equipment related to the project.
- 7.2 The Permit Holder shall submit a written report to the Minister 30 days following Deployment detailing the following:
  - a. A detailed and up-to-date project schedule;
  - b. A summary of any entities procured for goods/services;
  - c. Actual financial statements related to procurement, construction, operations, and monitoring activities;
  - d. Data relating to socio-economic matters; and
  - e. Any changes in the corporate governance structure of the Permit Holder.

- 7.3 The Permit Holder must notify the Program Administrator within ten (10) business days upon reaching the following milestone(s):
  - a. Receipt of any federal, provincial, or municipal regulatory approvals;
  - b. Approval of additional funding or grants;
  - c. Issuance of any manufacturing or fabrication contracts;
  - d. Installation of a generator and any cable or other equipment or structure used or intended to be used with a generator;
  - e. Commencement of decommissioning activities; and
  - f. Completion of decommissioning and rehabilitation activities
- 7.4 The Permit Holder shall notify the Program Administrator at least one (1) day prior to any press release related to the activities authorized under the Permit.
- 7.5 The Permit Holder shall provide baseline, tidal resource and environmental monitoring data acquired, developed, or created during the term of this Permit to the Nova Scotia Department of Energy and Mines upon request by the Minister.
- 7.6 The Permit Holder shall submit a written report to the Program Administrator thirty (30) days prior to the conclusion of the Permit term, summarizing the activities authorized under the Permit, if project objectives were met and any successes or lessons learned.
- 7.7 The Nova Scotia Department of Energy and Mines may disclosure data received pursuant to this Permit in accordance with the MReA and Regulations.

#### 8.0 Records Management

- 8.1 The record of data relating to the activities authorized under this Permit, including all books, records, accounts, documents and information related to those activities, must be accessible from an office located in the Province in accordance with section 27 of the Regulations.
- 8.2 The Permit Holder shall ensure that the books, records, accounts, documents and information remain accessible until at least five (5) years after the date the permit expires in accordance with section 29 of the Regulations.

#### 9.0 Incident Reporting

- 9.1 The Permit Holder shall notify the Program Administrator of any incident or near-miss, including information relating to the incident or near-miss, as soon as reasonably practicable but no later than twenty-four (24) hours after the incident or near-miss occurred.
- 9.2 The Permit Holder shall notify the Program Administrator within twenty-four (24) hours in advance of any press release or press-conference related to an incident or near-miss.
- 9.3 The Permit Holder shall ensure that:
  - a. Any incident or near-miss is investigated, its root cause and causal factors identified where possible corrective action taken where applicable; and
  - b. Any incident or near-miss is investigated, its root cause, causal factors and corrective action taken must be submitted in writing to the Program Administrator no later than thirty (30) days after the day on which the incident or near-miss occurred.

#### 10.0 Risk Management Plan

- 10.1 The Permit Holder's Risk Management Plan filed as part of the Application Document, shall be updated and resubmitted prior to turbine operation and then annually by the Permit Holder to the Minister on or before January 31, throughout the term of the Permit.
- 10.2 The Risk Management Plan shall contain all the information listed in section 18 of the Regulations.

#### 11.0 Decommissioning, Abandonment and Rehabilitation Plan

11.1 The Permit Holder shall not construct or install a generator, cable or other equipment or structure in the Sustainable Marine Energy (Canada) Ltd. Permit Area until the Minister has approved the Decommissioning, Abandonment and Rehabilitation Plan for the Permit Area. The Decommissioning, Abandonment and Rehabilitation Plan shall be submitted in writing to the Minister for approval prior to Deployment.

- 11.2 The Decommissioning, Abandonment and Rehabilitation Plan shall contain the estimated costs of all decommissioning activities on a third party basis, in addition to all the information listed in section 20 of the Regulations.
- 11.3 The Permit Holder must update and revise the Decommissioning, Abandonment and Rehabilitation Plan as required by the Minister throughout the life of the project. The Permit Holder must update and revise the plan if it becomes aware of anything that would materially increase the cost of any part of the plan. Any amendment shall be submitted to the Minister in accordance with section 22 of the Regulations.
- 11.4 The Permit Holder shall comply with the prescribed steps to decommission and rehabilitate the Sustainable Marine Energy (Canada) Ltd. Permit Area, as set out in section 21 of the Regulations.

### 12.0 Financial Security and Insurance

- 12.1 The Permit Holder shall provide proof of liability insurance to the Minister for approval prior to the commencement of any activities authorized under the Permit.
- 12.2 The Permit Holder shall maintain its insurance coverage in full force and effect for the term of the Permit. At a minimum, the Permit Holder shall maintain environmental impairment liability insurance, commercial general liability insurance and marine insurance coverage on any vessel employed during construction and Deployment of equipment in the Permit Area. Otherwise, the insurance shall be in a form and on terms and conditions acceptable to the Minister.
- 12.3 The Permit Holder shall ensure financial security is provided prior to the commencement of any activities authorized under the Permit on terms and conditions acceptable to the Minister. Financial security shall be in an amount to ensure decommissioning of the project based on the estimated cost of all decommissioning activities described in the approved Decommissioning, Abandonment and Rehabilitation Plan. If the estimated costs of the plan increase, when the Permit Holder updates the plan pursuant to 11.3, it shall also increase the amount of any financial security to reflect such increase in estimated costs immediately.
- 12.4 The Permit Holder shall ensure that any security provided prior to the commencement of any construction, installation, operation and

decommissioning of the activities approved under the Permit are kept in effect throughout the Permit term.

- 12.5 The Minister may determine the form in which financial security is provided, including any of the following forms:
  - a. Electronic transfer, cash deposit, or cheques made payable to the Minister of Finance, which the Province in its absolute discretion may cash at any time;
  - b. Government guaranteed bonds, debentures, term deposits, certificates of deposit, trust certificates or investment certificates assigned to the Minister of Finance; or
  - c. Irrevocable letters of credit, irrevocable letters of guarantee, performance bonds or surety bonds in a form acceptable to the Minister.
- 12.6 If a cash deposit is made, or a cheque is provided and is cashed, any unused amount shall be returned to the Permit Holder, without interest. Any and all interest earned accrues to the Province.
- 12.7 The Minister may use the financial security provided by the Permit Holder to remedy or cure any material default of MeRA, the regulations or the terms and conditions of this permit.

#### 13.0 Notice to Minister and Program Administrator

13.1 Notice, documents and other information required to be sent to the Minister of the Nova Scotia Department of Energy and Mines, shall be in writing and may be served by personal service or fax, addressed as follows:

Attention: Minister of Energy and Mines

Nova Scotia Department of Energy and Mines Joseph Howe Building 1690 Hollis Street Po Box 2664 Halifax, NS B3J 3J9

Phone: (902) 424-4575 Fax: (902) 424-0528 13.2 Notice and/or information required to be sent to the Program Administrator shall be in writing and sent via email to: <u>marinerenewables@novascotia.ca.</u>

# 14.0 Notice to the Regional Biologist

14.1 Notice required to be sent to the Regional Biologist, shall be in writing and sent via email to <u>Duncan.Bayne@novascotia.ca</u>.

#### 15.0 Standards

15.1 The Permit Holder must comply with industry standards for marine renewable energy conversion systems as they exist at the time of the issuance of this Permit and as amended, including but not limited to the International Electrotechnical Commission (IEC) Technical Committee (TC) 114.



The Sustainable Marine Energy (Canada) Ltd. Permit Area, depicted above as "Grand Passage Area #3", contains an area of 5.94 hectares.

# Schedule B – Project Description



# **Grand Passage Project – MRE Permit 2018-004**

# (Revised October 2019)

# 1. Project Plan

Sustainable Marine Energy (Canada) Ltd. (SMEC) has deployed an off-grid demonstration of the PLAT-I 4.63 tidal energy platform at Grand Passage, Digby County. The device was commissioned and tested in the winter and spring of 2019, and environmental monitoring data was collected and reported to the Department of Fisheries and Oceans (DFO) in the summer of 2019. This was the first Canadian demonstration of the PLAT-I technology and followed PLAT-I's inaugural and successful demonstration deployment in Connel, Scotland in late 2017 and the first half of 2018.

SMEC is currently awaiting a second authorization from DFO to operate PLAT-I and continue our testing and environmental monitoring programs. DFO has indicated that our application is complete, and that the new authorization will expire in December 2021. SMEC has also received a renewed permit from Transport Canada that does not expire.

Having resolved technical issues identified through operations in early 2019 and satisfied the terms of our DFO authorization, SMEC wishes to continue testing and demonstration of the PLAT-I 4.63 at Grand Passage through 2020. This ongoing demonstration will enable SMEC to continue performance testing, environmental monitoring and participation in research projects with Nova Scotia and international researchers and organizations. SMEC sees Grand Passage as our base for research, development and demonstration of current and future versions of the PLAT-I technology; the work being done is critical to ongoing regulatory and engagement processes and the future array deployment at the FORCE site in the Minas Passage.

#### **1.1. System Components**

For the proposed project, the PLAT-I 4.63 platform currently installed at Grand Passage will continue to be operated at a non-grid-connected installation. The trimaran design of the platform hosts four SCHOTTEL HYDRO Turbines (SITs) 250 turbines equipped with 6.3m diameter rotors. Under this configuration, the system has an at-platform rating of 280kW of electrical power in 2.3 m/s of tidal current with a corresponding RPM of 65.

Swing-up turbine deployment modules allow maintenance to the SITs at the water surface for inspection and maintenance. The electrical power produced by the individual turbines is conditioned in the operating and control enclosure located on-board the platform, and energy is dissipated through a load bank location on the central hull.

#### **1.2.** Ongoing Testing, Operation and Maintenance

The ongoing PLAT-I 4.63 demonstration is intended to achieve the following three objectives:



- 1. To test PLAT-I's generators, power conditioning equipment, environmental sensors, control systems, structural systems, and hydrodynamic performance in Canadian waters, including significant modifications made since deployment in Scotland
- 2. To prove engineering performance of the system, and
- 3. To provide a platform for engineering and environmental monitoring research that benefits the entire industry.

During operation the system will be tested in various modes, such as SITs raised, SITs parked, SITs operational, and controlled failure modes, such as single SIT operation. The platform will be monitored either from shore or on-board during normal operation. When remotely operating the platform, the system can be run on a continuous basis, pending DFO approval. Alarm systems are in place during operation to ensure personnel are notified of a non-conforming event. SMEC has an established shore base including an operations control centre, storage facilities, SMEagol marine vessel, and accommodations for staff.

To achieve the performance objectives, PLAT-I's on-board instrumentation will collect key information on platform and turbine performance and environmental conditions. The following instruments are currently in use on the platform:

Instrument	Data	Purpose
Mooring Shackles	Mooring line loads	To assess the line loads in different configurations and to compare with engineering predictions from numerical models and tank testing
Annular Load Cell	Mooring line loads	An alternative to the above, depending on the configuration of the mooring system
GPS	Position	To assess the degree of motion of the system, and monitor its global position
Anemometer	Wind speed and direction	To assess platform behaviour in different environmental conditions
IMUs	Acceleration, velocity and orientation	To assess platform motion in a variety of system configurations and environmental conditions
Valeport	Flow velocity	To measure flow speed and direction relative to the platform, for performance verification of all systems
Load pins	SDM load	To measure the load exerted on the cross-deck structure by the SITs and SDMs, particularly thrust and drag
Inverter	Power, Torque, RPM	To verify turbine performance for each SIT and compare to engineering predictions
Hydrophone	Ambient underwater noise, mammal vocalization, turbine noise	To measure underwater sound levels associated with ambient environment and platform, and to detect vocalizations of cetaceans including porpoises, dolphins and mysticetes
Underwater Video Cameras	Optical video images of all 4 turbines	To collect visual data that will allow an assessment of the probability of marine life interaction with the turbines



Previous performance assessment has been conducted using IEC/TS 62600-200 where applicable. This is the standard for '*Marine energy – Wave, tidal and other water current converters – Part 200: Electricity producing tidal energy converters – Power performance assessment*'. Performance assessment will be conducted for verification of engineering predictions, in particular along the primary load path. Results are published where possible. Environmental effects mitigation and monitoring will be conducted according to the terms and conditions of our pending DFO authorization.

#### **1.3. Decommissioning and Rehabilitation**

Following the completion of the demonstration deployment, the PLAT-I platform will be removed by the simple process of disconnecting it from the mooring connections and towing it out of the site. The mooring anchors are equipped with a retrieval mechanism and can be removed using the same marine assets used for deployment.

Decommissioning of the mooring spread will be completed in accordance with all regulatory requirements. At this time, SMEC is investigating the potential requirements of various government departments including Transport Canada, Environment and Climate Change Canada, Fisheries and Oceans Canada and the Nova Scotia Department of Energy and Mines. The latter will be discovered through the application process for a Demonstration Permit under the Marine Renewable Energy Act, which will include input from the Nova Scotia Department of Lands and Forestry.

While the regulatory requirements will govern the decommissioning requirements, other factors will be considered within those constraints. These include:

- Results of stakeholder engagement
- Post-project value of the anchors and associated equipment
- Cost of removal and rehabilitation
- Potential value of the mooring spread to future demonstration projects and /or use by local community stakeholders

Two potential scenarios for decommissioning are leaving the anchors in situ for future use, as described above, or complete removal from site.

#### **1.4. Schedule of Activities**

This demonstration project aims to continue the testing and monitoring of the existing PLAT-I 4.63 at Grand Passage. The planned dates for significant activities in the table below.



Activity	Start Date	End Date
Obtain DFO Authorization	Pending – assumed November 1, 2019	Assumed December 31, 2021
Operate PLAT-I, re- commissioning, system testing, data collection, optimization	November 2, 2019	December 31, 2020 (coincidental with requested MRE Permit extension)
Ongoing research projects with external organizations	Ongoing	November 30, 2020
Environmental Monitoring System Development (pending project with FORCE and OERA)	November 6, 2019	April 30, 2020
Decommission and remove PLAT-I 4.63 from station	November 1, 2020	November 30, 2020
Removal of Moorings and anchors (if required by regulator)	December 1, 2020	December 31, 2020

SMEC is also applying to NSDEM for an MRE Permit that would allow the PLAT-I 4.63 to be connected to the Nova Scotia electrical grid. If a permit is granted, Permit 2018-004 would be terminated once the new permit took effect. The testing, research and development activities described herein would be incorporated in the Project Plan to be carried out under the new permit.