

**TERMS OF REFERENCE FOR THE PREPARATION OF A FOCUS REPORT**

**Regarding the Canso Spaceport Facility  
Proposed by Maritime Launch Service Ltd.**

**NOVA SCOTIA ENVIRONMENT  
September 17, 2018**

## INTRODUCTION

The Canso Spaceport Facility (the Project or undertaking) proposed by Maritime Launch Service Ltd. (the Proponent) was registered for environmental assessment (EA) as a Class 1 undertaking pursuant to Part IV of the *Environment Act* on July 4, 2018. Under the Environmental Assessment Regulations, an undertaking that disrupts a total of 2 hectares or more of any wetland is a Class I undertaking.

On August 23, 2018, the Minister of Environment released a decision concerning this review. The Minister has determined that the registration information is insufficient to make a decision on the Project, and a Focus Report is required in accordance with clause 13(1)c of the Environmental Assessment Regulations, pursuant to Part IV of the *Environment Act*.

The Proponent is required to submit the Focus Report within one year of receipt of the Terms of Reference. Upon submission of the Focus Report by the Proponent, Nova Scotia Environment (NSE) has 14 days to publish a notice advising the public where the Focus Report can be accessed for review and comment.

A 30-day public consultation period of the Focus Report follows. At the conclusion of the 30-day public consultation period, NSE has 25 days to review comments, and provide a recommendation to the Minister.

The Minister of Environment will have the following decision options, following the review of the Focus Report:

- a. the undertaking is approved subject to specified terms and conditions and any other approvals required by statute or regulation;
- b. an environmental-assessment report is required; or
- c. the undertaking is rejected.

The following concerns identified during the review of the EA to the Proponent for response in the form of a Focus Report.

## **1. PROJECT DESCRIPTION**

1.1 Provide an updated description of the Project, including clarification of the following:

- It is understood the site operator will be Maritime Launch Services Ltd. Provide further information on responsibility for managing the launches;
- Solid propellants (e.g., perchlorate) were referenced in the EA Registration Document. Clarify whether other types of rockets will be used for the launches and explain what and how these propellants will be used;
- Clarify how many launches are expected annually. There is inconsistency in the EA Registration Document in this regard.

1.2 Given the highly toxic properties of hydrazine related chemicals (e.g., unsymmetrical dimethyl hydrazine, hydrazine and monomethylhydrazine), the following information requests are required as part of the Focus Report:

- A jurisdictional review on where hydrazine related chemicals are used for similar spaceport facilities in developed countries, and a list of spaceports in developed countries where hydrazine related chemicals are used currently;
- Information on precisely how, and for what purpose, hydrazine related chemicals are used by facilities highlighted above;
- A discussion of current regulatory requirements and standards where hydrazine related chemicals are used for spaceports in developed countries;
- A discussion to justify why hydrazine related chemicals are needed for the Project;
- A discussion regarding options to replace or reduce the use of hydrazine related chemicals for the Project.

## **2. EXPERTISE**

2.1 Expertise in the assessment of valued environmental components related to spaceports is required for this EA, and the resumes of these experts are required as part of the Focus Report.

## **3. DANGEROUS GOODS MANAGEMENT**

3.1 Provide details regarding the management of dangerous goods:

- Provide a list of chemicals and associated quantity to be used for the Project (e.g., rocket propellants, other fuel types, oxidizer, additives, etc.). The Chemical Abstracts Service registry number (CASRN) of these chemicals should also be provided;
- Clarify which hydrazine chemical(s) including associated CASRN and quantity will be used for the Project if hydrazine chemicals cannot be replaced with non-toxic or less toxic propellants;
- Clarify whether perchlorate related chemicals will be used for the Project;
- Provide detailed information on the environmental properties of hydrazine related substances and other uncommon chemicals to be used in the launches (including degradation products and rates, environmental persistence, fate and transport parameters, toxicity to aquatic and terrestrial organisms in water, soil and air).

3.2 Provide detailed procedures for the management of dangerous goods (e.g., transportation, handling, storage, etc.), including: transportation to and from the Project site, minimum separation distance between energetic liquids in a storage facility (intra-line setback), secondary containment and monitoring, etc.

3.3 Provide a detailed spill contingency plan(s). Given the hazardous properties of the substances potentially stored and used at the Project site and the various regulatory instruments that could be applicable, spill contingency plans specific to each fuel, oxidizer, etc. might be required.

3.4 Provide detailed procedures for fueling and de-fueling of rockets (e.g., due to unexpected circumstances such as bad weather), including purging and decontamination.

#### **4. WASTE MANAGEMENT**

4.1 Identify potential contaminants in waste water from the deluge water retention basin (e.g., metals, acids, dioxin and furans, etc.), as well as management measures of the contaminated waste water (e.g., how will the retention basin prevent the release of wastewater from entering the environment? Where will the waste water be stored and sent for treatment/disposal?).

4.2 Provide detailed procedures for testing fuels and oxidants and procedures for managing contaminated or off-spec materials in case of launch delays and/or accidental contamination of water during fueling.

4.3 Provide details for the management of waste dangerous goods and contaminated materials, including storage (types and maximum capacities) and transportation of these wastes.

4.4 Provide detailed assessment and clean-up procedures for spills and other accident and malfunction scenarios including launch failures related to the use of hydrazine related substances, which may impact surface water, groundwater and/or other applicable environmental media:

- Research and provide the appropriate notification and clean-up levels for chemicals (e.g., hydrazine related substances), as well as byproducts and daughter products of the chemicals which on release have the potential to contaminate various media (e.g. soil, surface water and groundwater) at the Project site;
- Identify sampling procedures and laboratories with reportable detection limits acceptable for the clean-up criteria identified for the impacted media;
- Provide a list of facilities approved to accept and treat the potential contaminated media.

It is important that these hazardous substances should be specifically identified (with their CASRN) so that requirements under the applicable regulatory instruments for notification, clean-up criteria, follow-up reporting and monitoring are understood.

## **5. WATER AND SOIL RESOURCES**

5.1 Conduct baseline studies to determine background conditions of relevant environmental media (e.g., surface water, groundwater, marine water, soil, etc.) that may be impacted by Project related activities including potential impacts from various chemicals to be used (e.g., hydrazine related chemicals).

5.2 Provide predictive and conceptual modelling for each credible worst-case accident and malfunction scenario, and assess potential Project related impacts on water (surface water including wetlands, groundwater and marine water) and soil (including concentrations and distribution) resulting from:

- Launch failure at ground zero;
- Launch failure in flight;
- Other major accident and malfunction (e.g., major spills or leaks on site);
- Normal launch exhaust fallout;
- Re-entry debris fallout.

It is recommended that fireball and heat flux modelling be undertaken to determine the spatial extent of possible effects.

5.3 Assess potential Project impacts on the sustainability of water supply (e.g., water quantity) in the general Project area.

5.4 Provide and update suitable avoidance, mitigation and/or monitoring measures (where necessary) to confirm impact predictions, and to prevent and minimize potential Project impacts on water and soil resources.

## **6. AIR QUALITY**

6.1 Quantify emissions of air contaminants (e.g., total particulate matter, fine particulate matter, sulphur dioxide, nitrogen compounds, carbon monoxide, hydroxyls, organic compounds, etc.) from Project related activities.

6.2 Quantify the ambient concentrations from Project emissions, as well as the secondary formation of pollutants (e.g. total suspended particulate formed through the condensation of primary emissions, acid deposition products formed through reactions with primary emissions of SO<sub>x</sub> and NO<sub>x</sub>, and/or ground-level ozone formation resulting from primary emissions of NO<sub>x</sub>, VOCs) using an appropriate methodology (e.g., air dispersion modelling) considering routine operation as well as accident and malfunction scenarios including potential catastrophic launch failure.

6.3 Provide and update suitable avoidance, mitigation and/or monitoring measures (where necessary) to confirm impact predictions, and to prevent and minimize potential Project impacts on air quality.

## **7. NOISE**

7.1 Identify the nearest residents and seasonal cottages to the launch pad and propellant storage area.

7.2 Provide noise modelling information (e.g., model assumptions and output sheets). It is recommended Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise*, be reviewed and applied in the model where relevant.

7.3 Provide and update suitable avoidance, mitigation and/or monitoring measures (where necessary) to confirm impact predictions, and to prevent and minimize potential Project impacts on acoustic environment.

## **8. FLORA AND FAUNA**

8.1 Further baseline studies for shorebirds and seabirds will be required, and this requirement can be deferred before commencement of the Project, if the Project is approved.

8.2 Assess potential noise impacts on birds and other wildlife.

8.3 Assess potential impacts of all chemical substances used in launch activities and/or its byproducts or daughter products on wildlife and wildlife habitat, from routine Project operation and/or accidents involving these chemicals.

8.4 Provide additional details regarding mitigation, management and/or monitoring measures to confirm impact prediction, and to mitigate potential Project impacts on wildlife and wildlife habitat (e.g., noise, lighting, release of sediments and hazardous materials, Project accident and malfunction, etc.).

## **9. FISH AND FISH HABITAT**

9.1 Further baseline studies to collect fish habitat information for Publicover Lake and its two tributaries (Watercourse 1 and 2) will be required, and this requirement can be deferred before commencement of the Project, if the Project is approved.

## **10. PROTECTED AREAS AND PARKS**

10.1 Assess potential Project related impacts on nearby protected areas and parks (potential impacts including but not limited to air, water and noise).

10.2 Provide and update suitable avoidance, mitigation and/or monitoring measures (where necessary) to confirm impact predictions, and to prevent and minimize potential Project impacts on protected areas and parks.

## **11. HUMAN HEALTH**

11.1 Assess potential impacts of hydrazine related chemicals used in launch activities and/or its byproducts or daughter products on human health, from routine Project operation and/or accidents involving these chemicals. Provide references from studies done in other jurisdictions and indicate how the information in these studies is relevant to this particular Project.

11.2 Identify the nearest residents and seasonal cottages to the launch pad and propellant storage area.

11.3 Discuss minimum separation distance between the public and energetic fluids co-located in a launch vehicle and how this setback distance is determined.

11.4 Discuss minimum separation distance between the public and launch pad during launch operations, and how this setback distance is determined.

11.5 Provide and update suitable avoidance, mitigation and/or monitoring measures (where necessary) to confirm impact predictions, and to prevent and minimize potential Project impacts on human health.

## **12. CONTINGENCY PLANNING**

12.1 Provide a detailed contingency plan that includes the following:

- A full hazard identification and qualitative risk assessment associated with Project construction and operation, including those which have or may have an environmental impact (directly or indirectly);
- Prevention, mitigation and contingency measures to mitigate potential Project impacts;
- A discussion of measures to mitigate potential impacts or damages on the environment, properties and human health (e.g., liability insurance, financial security, etc.).

12.2 Discuss potential Project impacts on emergency and health services in communities near the Project area, and associated mitigation and contingency measures in the events of major Project related accidents and malfunctions.