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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: **3BC-MAR1014**

January 7, 2010

Dr. Robert Zubrin, President
Mars Society
11111 W. 8th Ave., unit A
Lakewood, CO 80215, USA
Email: zubrin@aol.com

RE: NWB Licence No. 3BC-MAR1014

Dear Robert Zubrin,

Please find attached Licence No. **3BC-MAR1014** issued to the Mars Society by the Nunavut Water Board (NWB) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*. The terms and conditions of the attached Licence related to water use and waste disposal are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then water use and waste disposal must cease, or the Licensee will be in contravention of the *Nunavut Land Claims Agreement* (NLCA) and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWSRTA). However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least three months prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this licence, the NWB may decide, in the public interest, to hold a public hearing. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment, however a minimum of sixty (60) days is required from time of acceptance by the NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received by interested persons and the issues identified. GN-DOE recommends the use of a sump rather than

incineration of toilet wastes. EC advises that most batch incinerators in the north are not designed for sewage incineration and a letter should be provided from the incinerator manufacturer stating that the equipment is suitable for sewage disposal. This information is attached for your consideration.¹

INAC recommended that an updated Annual Report should be submitted for 2009 that addresses the identified deficiencies prior to renewal of the Licence. The NWB has taken this into consideration and has requested that the Licensee submit a complete, revised Annual Report prior to March 31, 2010. In its revised submission, the Licensee shall address all deficiencies raised by INAC. This Requirement is detailed under Part B, Item 2.

Sincerely,



Thomas Kabloona
Nunavut Water Board
Chair

TK/dc

Enclosure:

Licence No. **3BC-MAR1014**
Comments

cc: Distribution – Qikiqtani

¹ Indian and Northern Affairs Canada (INAC), October 15, 2009; Environment Canada (EC), November 5, 2009; Government of Nunavut – Department of Environment (GN-DOE), November 5, 2009 and Government of Nunavut – Department of Culture, Language, Elders and Youth (GN-CLEY), October 6, 2009

TABLE OF CONTENTS

DECISION	1
WATER LICENCE	2
PART A: SCOPE, DEFINITIONS AND ENFORCEMENT	3
1. SCOPE	3
2. DEFINITIONS	3
3. ENFORCEMENT	4
PART B: GENERAL CONDITIONS	5
PART C: CONDITIONS APPLYING TO WATER USE	6
PART D: CONDITIONS APPLYING TO WASTE DISPOSAL	7
PART E: CONDITIONS FOR CAMPS, ACCESS INFRASTRUCTURES AND OPERATIONS	8
PART F: CONDITIONS APPLYING TO DRILLING OPERATIONS	8
PART G: CONDITIONS APPLYING TO MODIFICATIONS	8
PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING	9
PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION OR TEMPORARY CLOSING	10
PART J: CONDITIONS APPLYING TO THE MONITORING PROGRAM	11

DECISION

LICENCE NUMBER: 3BC-MAR1014

This is the decision of the Nunavut Water Board (NWB) with respect to an application dated September 30, 2009 for a renewal of a Water Licence made by:

MARS SOCIETY

to allow for the use of water and disposal of waste during camp operations in support of research activities at the Flashline Mars Arctic Research Station Project located within the Qikiqtani Region, Nunavut and generally located at the geographical coordinates as follows:

Latitude: 75° 25' 53"N Longitude: 89° 49' 27"W (Existing camp)

DECISION

After having been satisfied that the application was in conformity with the North Baffin Regional Land Use Plan and exempt from the requirement for screening by the Nunavut Impact Review Board in accordance with Section 12.4.3 of the *Nunavut Land Claim Agreement* (NLCA), the NWB decided that the application could proceed through the regulatory process. In accordance with S.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA) and Article 13 of the NLCA, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the Applicant and considering the representations made by interested persons, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the NLCA and of the NWNSRTA, waived the requirement to hold a public hearing, and determined that:

Licence Number 3BC-MAR1014 be issued subject to the terms and conditions contained therein. (Motion #: 2009-18-03)

SIGNED this 7th day of January 2010 at Gjoa Haven, NU.



Thomas Kabloona
Nunavut Water Board
Chair

TK/dc



NUNAVUT WATER BOARD WATER LICENCE

Pursuant to the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

MARS SOCIETY

(Licensee)

11111 W. 8TH AVE., UNIT A, LAKEWOOD, CO, 80215, USA

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number/Type: 3BC-MAR1014 TYPE "B"

Water Management Area: NUNAVUT 04

Location: FLASHLINE MARS ARCTIC RESEARCH STATION
PROJECT; DEVON ISLAND, QIKIQTANI REGION,
NUNAVUT

Classification: MUNICIPAL UNDERTAKING

Purpose: DIRECT WATER USE AND DEPOSIT OF WASTE

Quantity of Water use not
to Exceed: ONE (1) CUBIC METRE PER DAY

Date of Licence Issuance: JANUARY 7, 2010

Expiry of Licence: SEPTEMBER 30, 2014

This Licence, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Thomas Kabloona,
Nunavut Water Board
Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

This Licence allows for the use of water and the disposal of waste for a Municipal undertaking as per Schedule II of the *Regulations*, at the Flashline Mars Arctic Research Station Project (FMARS), located on Devon Island approximately 150 km northeast of Resolute Bay within the Qikiqtani Region, Nunavut.

- a. This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any waters. Whenever new *Regulations* are made or existing *Regulations* are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such *Regulations*, to be subject to such requirements; and
- b. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

“Act” means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“Addendum” means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report.

“Amendment” means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

“Appurtenant Undertaking” means an undertaking in relation to which a use of water or a deposit of waste is permitted by a licence issued by the Board;

“Board” means the Nunavut Water Board established under the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“Engineer” means a professional engineer registered to practice in Nunavut in accordance with the Engineering, Geological and Geophysical Act (Nunavut) S.N.W.T. 1998, c.38, s.5;

“Greywater” means all liquid wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet wastes;

“Inspector” means an Inspector designated by the Minister under Section 85 (1) of the Act;

“Licensee” means the holder of this Licence;

“Modification” means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

“Nunavut Land Claims Agreement” (NLCA) means the *“Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada”*, including its preamble and schedules, and any amendments to that agreement made pursuant to it;

“Regulations” means the *Northwest Territories Water Regulations* sor/93-303 8th June, 1993, omitting Section 5, Water Use or Waste Deposit Without a Licence;

“Sewage” means all toilet wastes and greywater;

“Spill Contingency Plan” means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

“Sump” means an excavation in impermeable soil for the purpose of catching or storing water or waste;

“Toilet Wastes” means all human excreta and associated products, but does not include greywater;

“Waste” means, as defined in S.4 of the Act, any substance that, by itself or in combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means.

3. **Enforcement**

- a. Failure to comply with this Licence will be a violation of the Act, subjecting the Licensee to the enforcement measures and the penalties provided for in the Act;
- b. All inspection and enforcement services regarding this Licence will be provided

by Inspectors appointed under the *Act*; and

- c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported, containing the following information:
 - a. A summary report of water use and waste disposal activities;
 - b. A list of unauthorized discharges and a summary of follow-up actions taken;
 - c. Any revisions to the Spill Contingency Plan, including contact information, as required by Part H, Item 2, submitted in the form of an Addendum;
 - d. A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;
 - e. A summary of all information requested and results of the Monitoring Program; and
 - f. Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.
2. The Licensee shall resubmit to the Board by March 31, 2010, a revised 2009 Annual Report. The revised annual report shall address or include all information deficiencies raised by Indian and Northern Affairs Canada (INAC) as well as the requirements of Part B, Item 1.
3. The Licensee shall notify the NWB of any changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.
4. The Licensee shall install flow meters or other such devices, or implement suitable methods required for the measuring of water volumes as required under Part J, Item 1.
5. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.
6. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

7. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.
8. The Licensee shall review all Plans submitted under this Licence as required by changes in operation and/or technology and modify the Plans accordingly. Revisions to Plans are to be submitted in the form of an Addendum to be included with the Annual Report.
9. The Licensee shall ensure a copy of this Licence is maintained at the site of operations at all times. Any communication with respect to this Licence shall be made in writing to the attention of:
 - (a) **Manager of Licensing:**
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nunavutwaterboard.org
 - (b) **Inspector Contact:**
Manager of Field Operations, INAC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445
10. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.
11. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the Board is received and acknowledged by the Manager of Licensing.
12. This Licence is assignable as provided for in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all water for domestic camp use from Lowell Creek (locally named stream) northwest of camp. Total domestic water use shall not exceed one (1) cubic meter per day.
2. Streams cannot be used as a water source unless authorized and approved by the Board in writing.

3. If the Licensee requires water in sufficient volume that the source water body may be drawn down the Licensee shall, at least thirty (30) days prior to commencement of use of water, submit to the Board for approval in writing, the following: volume required, hydrological overview of the water body, details of impacts, and proposed mitigation measures.
4. The Licensee shall equip all water intake hoses with a screen of an appropriate mesh size to ensure that fish are not entrained and shall withdraw water at a rate such that fish do not become impinged on the screen.
5. The Licensee shall not remove any material from below the ordinary high water mark of any water body unless authorized.
6. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.
7. Sediment and erosion control measures shall be implemented prior to and maintained during the operation to prevent entry of sediment into water.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty one (31) metres from the ordinary high water mark of any water body such that the quality, quantity or flow of water is not impaired, unless otherwise approved by the Board in writing.
2. The Licensee shall not practice on-site land filling of domestic waste, unless otherwise approved by the Board in writing.
3. The Licensee is authorized to dispose of all acceptable food waste, paper waste and untreated wood products in an incinerator.
4. The Licensee shall provide to the Board, documented authorization from the community of Resolute Bay or other Nunavut destination, prior to the backhauling of any waste.
5. The Licensee shall backhaul and dispose of all hazardous wastes, waste oil and non-combustible waste generated through the course of the operation in an approved waste disposal site.
6. The Licensee shall maintain records of all waste backhauled and records of confirmation of proper disposal of backhauled waste. These records shall be made available to an Inspector upon request.
7. The Licensee shall dispose of all greywater in a sump located at a distance of at least thirty one (31) metres above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible and no additional impacts are

created, unless otherwise approved by the Board in writing.

8. The Licensee shall contain all toilet wastes in latrine pits or use incineration, chemical, portable or composting toilets. Latrine pits shall be located at a distance of at least thirty one (31) metres above the ordinary high water mark of any water body, treated with lime and covered with native material to achieve the pre-existing natural contours of the land prior to seasonal closure of the camp or final abandonment.

PART E: CONDITIONS FOR CAMPS, ACCESS INFRASTRUCTURES AND OPERATIONS

1. The Licensee shall not erect camps or store material on the surface of frozen streams or lakes including immediate banks except what is for immediate use. Camps shall be located such as to minimize impacts on surface drainage.
2. All activities shall be conducted in such a way as to minimize impacts on surface drainage and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.
3. Winter lake and stream crossings, including ice bridges, shall be constructed entirely of water, ice or snow. The Licensee should minimize disturbance by locating ice bridges in an area that requires the minimum approach grading and the shortest crossing route. Stream crossings shall be removed or the ice notched prior to spring break-up.
4. With respect to access road, pad construction or other earthworks, the deposition of debris or sediment into or onto any water body is prohibited. These materials shall be disposed a distance of at least thirty one (31) metres from the ordinary high water mark in such a fashion that they do not enter the water.

PART F: CONDITIONS APPLYING TO DRILLING OPERATIONS

1. The Licensee is not authorized to drill under the provisions of this Licence.

PART G: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply Facilities and Waste Disposal Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:
 - a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
 - b. such Modifications do not place the Licensee in contravention of the Licence or the Act;
 - c. such Modifications are consistent with the NIRB Screening Decision;

- d. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
 - e. the Board has not rejected the proposed Modifications.
- 2. Modifications for which all of the conditions referred to in Part G, Item 1 have not been met can be carried out only with written approval from the Board.
- 3. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

- 1. The Licensee shall submit to the Board for approval within sixty (60) days of issuance of the Licence, a Spill Contingency Plan prepared in the format set out by the Consolidation of Spill Contingency Planning and Reporting Regulations R-068-93. In addition, the Plan should address comments raised by interested parties during the renewal application review and include the following:
 - a. The name, address and contact number for the person in charge, management or control of the contaminant (in this case, fuel oil and any other chemicals associated with the program);
 - b. The name and address and telephone number of the employer;
 - c. The name, job title and 24 hour contact number for the person or persons responsible for activating the spill plan;
 - d. A detailed description of the facility, including its geographic location – in UTM coordinates (map sheet number, Eastings and Northings) and geographic coordinates (Lat/Long) – size and storage capacity;
 - e. A description of the type and amount of contaminants stored on site;
 - f. A description of the spill prevention measures to be undertaken in the handling, storage and disposal of petroleum products and hazardous materials;
 - g. Steps taken to report, contain, clean up and dispose of a spill;
 - h. A site map of sufficiently large scale to show the location of buildings, contaminants storage areas, sensitive areas such as water bodies, probable pathways of contaminant flow and general topography;
 - i. A description of the spill response training provided to employees who will respond to a spill;
 - j. An inventory and location of the response and clean up equipment (spill kits) available to the spill clean-up team;
 - k. The means by which the spill plan is activated; and
 - l. The date that the spill plan was prepared
- 2. The Licensee shall prevent any chemicals, petroleum products or wastes associated with the project do not enter water. All sumps and fuel caches shall be located at a distance of at least thirty one (31) metres from the ordinary high water mark of any adjacent water body and inspected on a regular basis.

3. The Licensee shall ensure that any equipment maintenance and servicing be conducted only in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other waste and contain potential spills.
4. If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a. Employ the Spill Contingency Plan;
 - b. Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
 - c. For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.

PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION OR TEMPORARY CLOSING

1. The Licensee shall submit to the Board for approval within sixty (60) days of issuance of this Licence, an Abandonment and Restoration Plan prepared in accordance with applicable sections of the "Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories (1990)".
2. The Licensee shall complete all restoration work prior to the expiry of this Licence.
3. The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.
4. The Licensee shall backfill and restore all sumps to the pre-existing natural contours of the land.
5. The Licensee shall remove from the site, all infrastructure and site materials, including all fuel caches, drums, barrels, buildings and contents, docks, water pumps and lines, material and equipment prior to the expiry of this Licence.
6. All roads and airstrip, if any, shall be re-graded to match natural contour to reduce erosion.
7. All culverts shall be removed and the drainage opened up to match the natural channel. Measures shall be implemented to minimize erosion and sedimentation.
8. In order to promote growth of vegetation and the needed microclimate for seed deposition, all disturbed surfaces shall be prepared by ripping, grading, or scarifying the surface to conform to the natural topography.

9. Areas that have been contaminated by hydrocarbons from normal fuel transfer procedures shall be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, January 2002. The use of reclaimed soils for the purpose of back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector.
10. All disturbed areas shall be contoured and stabilized upon completion of work and restored to a pre-disturbed state.

PART J: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall measure and record, in cubic metres, the daily and annual quantities of water utilized for camp and other purposes.
2. The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.
3. The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations are deposited.
4. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board in writing.
5. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.
6. The Licensee shall include in the Annual Report required under Part B, Item 1 all data, monitoring results and information required by this Part.