

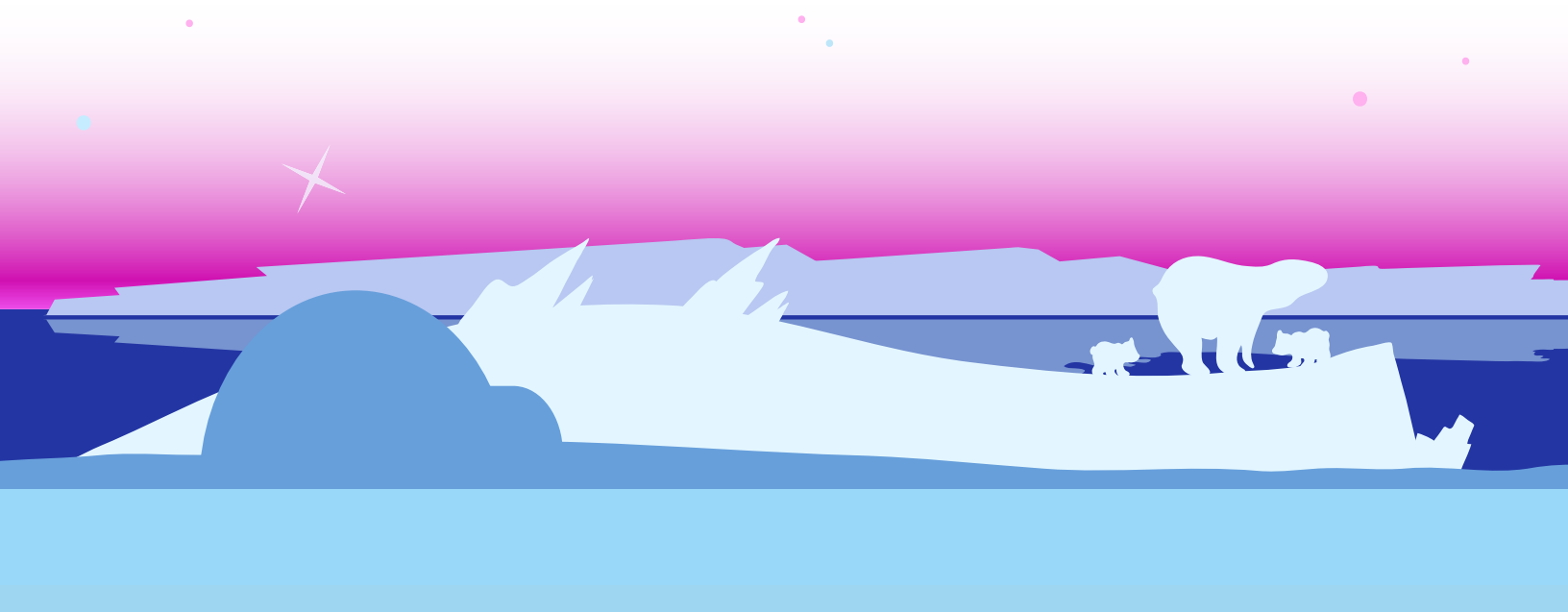
# AMARUK®

THE WILDERNESS EXPERTS™

## ENVIRONMENTALLY SUSTAINABLE OUTDOOR PRACTICES IN ARCTIC REGIONS

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IN ARCTIC REGIONS**

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# 1. INTRODUCTION

This field guide is intended to provide guidance for expedition leaders so they may engage in sustainable environmental practices, and thus, minimize or even eliminate any impact their party will have on the Arctic environment.

This publication is not intended to be an outdoor skills manual, and it is assumed that all Team Leaders have the necessary experience and expertise to lead Arctic expeditions.

Some sections may outline several options:

**Best Practices:** Practices that have been found to be best to minimize or eliminate any environmental impact. Such practices should be strongly encouraged.

**Acceptable Practices:** Practices that have been found to mitigate or minimize any environmental impact, without eliminating such impact. Such practices should be followed when it is not possible or practical to comply with *Best Practices*.

**Unsustainable Practices:** Practices that will result in an adverse impact on the environment. Such practices should be avoided.

Comments or suggestions are welcome, especially as they relate to unlisted techniques that would qualify as best or acceptable practices in this guide. Please email Christopher Fragassi, Chief Environmental Officer, at [Chris.Fragassi@Amaruk.com](mailto:Chris.Fragassi@Amaruk.com).

## 2. WINTER EXPEDITIONS

### 2.1. Overview

This section provides sustainable environmental practices for any expedition conducted in winter in an Arctic or sub-arctic environment. For the purpose of this guide, winter is defined as any period during which the ground is frozen and covered with ice or snow. The goal of such practices is to minimize, if not eliminate altogether, the human impact on this sensitive environment.

From an ecological standpoint, the environmental impact in the Arctic is greatly reduced in winter due to the barrier of ice and snow protecting the sensitive plant life below. Setting up tents, trekking, or landing craft is all easier on this sensitive environment when it is done in winter. Conducting expeditions in winter is therefore greatly encouraged.

### 2.2. Preparation

A *Team Leader* should be designated and should be responsible for the implementation of the sustainable environmental practices contained in this guide. All members of the expedition should be briefed and trained in sustainable practices. They should understand that sustainable environmental practices are everyone's responsibility.

Policies should also be implemented to ensure all members of the expedition are adequately dressed for the elements, and a minimum equipment list should be provided to avoid the need for fuel heating or even rescue.

Expedition members should also be trained in the operation of the various pieces of equipment being used, and should understand that equipment such as stoves, manual tools, batteries, and electronics will have temperature and operational limitations.

### 2.3. Equipment and Clothing

#### ***Best Practices:***

The use of quality, reliable and durable equipment is recommended for any Arctic expedition. Equipment failure may indeed lead to various problems, from the need to use artificial heat sources (inherently unsustainable), to injuries and even the possibility of requiring a rescue.

Weight and volume of equipment is also a major consideration, since it will dictate the method of transportation to be used, the practicality of human powered transportation, as well as the amount of greenhouse gas emissions.

Material used in the manufacturing of the equipment is another consideration. For example, plastic components on equipment will tend to break in extremely cold weather, leading to damage, loss of use and

unnecessary waste.

In order to avoid the use of fossil fuels to keep warm, extreme cold weather clothing should be used. This includes sleeping bags, boots, layered clothing, warm underwear, soft shells, outer shells, and parkas specifically designed and rated for extremely cold temperatures.

***Unsustainable Practices:***

Using inadequate clothing, or equipment that is designed to be disposable is strongly discouraged. Inappropriate clothing, besides potentially leading to a life threatening situation could also lead to the need for a rescue, and therefore, undue environmental stress. Equipment failure may also result in a similar situation while generating more waste.

## **2.4. Transportation to Site**

Several factors need to be taken into consideration when selecting a transportation method to a given site. Immediate impact, such as soil and vegetation damage, direct pollution, and disturbances to wildlife, long-term impact, and greenhouse gas emissions must be taken into consideration.

***Best Practices:***

The best method of transportation from an environmental point of view remains human powered travel. Pulling a personal sled over frozen areas covered with ice or snow will inherently have a lower impact on soil damage, pollution, stress to wildlife, and will limit greenhouse gas emissions.

***Acceptable Practices:***

Human powered travel may not always be possible. In such cases, the preferred method of transportation to a winter camp site is by sea or by air. Planes, helicopters or ice breakers may be used to carry equipment, supplies and personnel.

In order to prevent soil damage, the landing site should be carefully selected to ensure it is frozen, and covered with as much ice and/or snow as possible. Areas that are frozen but with exposed vegetation should be avoided.

Any landing should also be conducted in an area away from any sign of wildlife to prevent undue stress to the fauna.

Although greenhouse gas emissions are inherent to mechanized travel, they can be minimized through the use of more fuel efficient aircraft and ships, as well as through the reduction of cargo through proper expedition planning and careful gear selection.

The use of dog sleds may also be considered if dog waste is managed like human waste (*Section 2.10. Human Waste Management*).

***Unsustainable Practices:***

The use of snowmobiles may be considered as a last resort, due to their high impact on the environment. Tracks will often damage soil underneath thin layers of snow or ice, mechanical noises will cause

stress to wildlife, and engines will generate high greenhouse gas emissions.

In order to minimize soil and vegetation damage, travel on thick layers of snow and ice is best. Extreme care should be taken in filling fuel tanks in order to avoid spillage. Wildlife corridors, or any area occupied by wildlife should be avoided. Lastly, greenhouse gas emissions should be reduced through the use of more recent, more fuel efficient machines, and a reduction in gear, equipment, and supplies being transported.

## 2.5. Site Selection

### ***Best Practices:***

It is important to ensure that the camp site is established within walking distance, but at least 100 metres from a body of water. In winter, liquid water is still accessible from lakes by drilling holes through the ice. If establishing your campsite by a lake is not an option, there are various methods of collecting ice and snow, melting it, then treating it for consumption.

The camp site should be located in an area sheltered from the wind if at all possible, while ensuring it is not exposed to potential rock slides or avalanche.

Thick layers of snow or ice, without exposed vegetation, or rocky areas are best. Level terrain is preferred as it will be more stable and will also translate to a more comfortable camp site. The selected site should be close to any area as it relates to the goal of the expedition to avoid unnecessary travel.

Although it may be difficult to determine, try to avoid wildlife corridors to prevent unnecessary wildlife conflicts.

### ***Acceptable Practices:***

Selecting a site far from a source of water may be acceptable if no suitable site can be found in proximity to a source of water. However, it is important that all members of the camp are physically capable of walking to a water source without the aid of mechanized travel.

### ***Unsustainable Practices:***

Establishing camp on exposed vegetation, in a wildlife corridor, and too far from a source of water should be avoided.

## 2.6. Camp Set up and Maintenance

A camp site should be set up and maintained to ensure that there is no trace of any human presence or environmental damage whatsoever upon vacation.

### ***Best Practices:***

The building of igloos should be encouraged. This minimizes the equipment/cargo loads, and thus, nutri-

tional needs, resulting waste, and greenhouse gas emissions. This also prevents the anchoring of tent pegs through ice and snow, which may damage frozen flora or soil below the tent.

One igloo may be sufficient to accommodate all the needs of a limited number of people. For larger groups however, several structures may have to be erected, allowing the use of one igloo as a common area and cooking quarters, and the other igloos as sleeping quarters. An additional igloo may be used as a bathroom and washroom. Please see *Section 2.10. (Human Waste Management)* and *Section 2.12. (Waste Water Management)* for more information.

Personal equipment may be stored in sleeping quarters (with the exception of food, flavoured drinks and toiletries), and common equipment may be stored in the common area, while heavier equipment and supplies may be kept outside of the igloos.

Spacing between igloos should be based on practical needs and kept to a minimum in order to reduce the size of the camp, and thus, any potential environmental foot print.

*It is important to note that the building of igloos should only be conducted by qualified and experienced builders, such as local people. If the skill of building an igloo has not been mastered, tents should be used as per the following guidelines.*

#### **Acceptable Practices:**

If building igloos is either impractical or impossible, the use of tents is acceptable. 4-season tents, tested in extreme environments, such as extreme winds and temperatures, should always be used. Inadequate tents could either be damaged or destroyed in adverse weather, or fly away from the camp, thereby polluting the environment.

Tents with a capacity of 3 people should always be used to minimize total foot print of the tent, while providing the potential for body heat exchange. Such tents should however only be occupied by two individuals in order to allow for the storage of personal equipment, as equipment weight will contribute to anchoring the tent on the ground, and minimize the use and depth of pegs or other anchoring devices. Storage of personal equipment in the tent should under no circumstances include food, drinks (with the exception of water), or toiletry items to prevent any wildlife conflict.

A larger dome-style tent may be used as a common/cooking area. An extra 3-person tent may be used as a bathroom and washroom. Please see *Section 2.10. (Human Waste Management)* and *Section 2.12. (Waste Water Management)* for more information.

The tent sites should always be in an area with thick ice and/or snow, and away from any section of exposed vegetation.

Spacing between tents should be based on practical need and kept to a minimum to reduce the size of the camp.

#### **Unsustainable Practices:**

The use of large temporary shelters designed to accommodate larger groups of people should be discouraged, as they will most likely impact the soil due to their larger foot print, will not maintain heat efficiently, and will consume more resources during transport.

## 2.7. Food and Nutrition

Food supplies should be sufficient to fulfill the nutritional needs of each expedition member, while avoiding overeating, which will produce a higher amount of waste, and will have a potentially negative impact on the environment. Caloric expenditure should be determined on a daily basis, and the amount of food packed assessed accordingly, taking into consideration reserve supplies in case of emergency, isolation, or delayed pick up.

### **Best Practices:**

Freeze dried foods should always be used for hot entrees. Nuts, beef jerky, dried fruits and other dry products are also recommended. Water required to prepare food should be obtained by heating ice or snow on a fuel or propane stove. Food should be consumed directly from the individual pouches to avoid the use of dishes as much as possible. Unconsumed food should be handled as per *Section 2.11. (Organic Waste Management)*, while food pouches are managed as per *Section 2.13. (General Waste Management)*.

Utensils and any dishes should be washed using a minimum amount of water and biodegradable soap, and the resulting waste should be handled as per *Section 2.11. (Organic Waste Management)*, and *Section 2.12. (Waste Water Management)*.

### **Acceptable Practices:**

Freeze-dried and other dried foods may be complemented or replaced by frozen foods and meats. However, cooking should still occur through the use of fuel or propane devices.

Dishes should be washed using a minimum amount of water and biodegradable soap, and the resulting waste should be handled as per *Section 2.11. (Organic Waste Management)*, and *Section 2.12. (Waste Water Management)*.

If using dog sleds, dogs may be fed with raw meat, as they will generally consume all meats and bones without leaving any waste.

### **Unsustainable Practices:**

The use of fires to either boil water or cook meats and other meals should be avoided and only reserved for emergency situations.

## 2.8. Drinking Water

Water in the winter season in the Arctic will usually be frozen, unless obtained through several feet of ice over a lake. As a result, the use of fuel to heat and boil water may be unavoidable, even if this will result in greenhouse gas emissions.

### **Best Practices:**

If close to a lake, a hole should be drilled through the ice to access liquid water, which should be boiled

for 5 minutes. Drinking water may also be obtained by heating and boiling ice or snow for 5 minutes.

***Acceptable Practices:***

The use of water purification tablets is acceptable but impractical. The water will need to be maintained in a liquid state as the tablets will take time to dissolve and treat the water. Additionally, accidental environmental contamination is possible.

***Unsustainable Practices:***

Bringing supplies of fresh water is strongly discouraged due to the resources and energy required for transportation.

## **2.9. Personal Hygiene**

Personal hygiene in a camp environment is important both for individuals and the camp as a whole. Each expedition member should be responsible for his or her own hygiene, and comply with proper waste management guidelines as outlined in *Sections 2.11. (Organic Waste Management) and 2.12. (Waste Water Management)*.

In order to avoid cross contamination of food with waste, it is recommended that each person be responsible for the preparation of their own meals, and that meals be prepared away from any waste.

***Best Practices:***

Personal hygiene is carried out with as little water as possible and unscented sanitary wipes are a practical way of maintaining hygiene while allowing waste to be carried out. Using deodorant alternatives such as a salt crystal in odour causing areas of the body will actually help to prevent the development of odour causing bacteria and can reduce the frequency of bathing. Oral hygiene should be attended with an all-natural ingredient toothpaste or biodegradable toothpaste, free of fluoride, and ensure that any by-product of teeth cleaning is not disposed of into the environment and is managed as per *Section 2.12. (Waste Water Management)*.

***Acceptable Practices:***

Use sponges, water and biodegradable soap as a means of bathing instead of wipes. Soiled or waste water can be poured into the ground away from the camp site, but never into, or in proximity of, any body of water. Oral hygiene is maintained with a natural ingredient or biodegradable toothpaste, and the rinse water should be disposed of away from camp into the ground, but never into a body of water.

***Unsustainable Practices:***

As a last resort, an outdoor shower may be set up; however the temperature of the water must not exceed a temperature that would be detrimental to flora or fauna under the shower, or draining away from a shower. Runoff from a shower must not directly drain into a stream or body of water and must first be absorbed into the ground. Biodegradable soap and all-natural ingredient toothpaste or biodegradable toothpaste must be used and can be disposed of in an area away from the camp and into the ground, never into a body of water.

## 2.10. Human Waste Management

Human waste, especially urine, have been found to contain traces of many chemicals, medicine and other compounds, linked to a wide array of environmental ailments, including interference with the reproductive process of various species. Human waste such as excrement also have the potential to introduce excess nutrients to an eco-system, thereby affecting the balance of the sensitive Arctic environment. With this in mind, contamination of a site with human waste should be avoided.

### ***Best Practices:***

Urination and defecation, as well as toilet paper and personal wipes, should be contained in specifically designed bags, such as WAG bags. These individual bags will solidify the waste, remove odours, and accelerate decomposition. Used bags are then to be safely stored in designated waste containers, and removed from the site upon vacation for appropriate disposal in a landfill.

It is important to note that if a dog sled is to be used, dog excrement should be picked up and disposed of in the same fashion than human waste.

### ***Unsustainable Practices:***

The use of latrines, portable composting toilets, or holes dug in the soil or snow should be avoided. Decomposition will indeed take much longer in the Arctic than in other environments. Additionally, such practices do not prevent soil and water contamination with the chemicals, medicines and other pollutants found in human waste. It is also evident that such practices will leave substantial traces of human presence for extended periods of time.

## 2.11. Organic Waste Management

The disposal of organic waste, such as food waste, in an Arctic environment may result in the addition of excess nutrients to the eco-system, and may result in adverse effects on the environment. No organic waste should be released into the environment.

### ***Best Practices:***

Each individual should endeavour to minimize waste from food by ensuring adequate portions based on nutritional needs. Any organic waste should be packed in biodegradable, non-paper bags, and then be stored in designated waste containers. Such containers should later be removed from the site upon vacation, and disposed of in a designated landfill.

### ***Unsustainable Practices:***

The disposal of organic waste in the environment is not encouraged. As with human waste, decomposition will take longer in the Arctic than other environments. It is also evident that such practices will leave substantial traces of human presence for extended periods of time.

## 2.12. Waste Water Management

This section only covers the management of grey water, namely water used in the preparation of foods, washing of clothes and dishes, or for personal hygiene if applicable. It does not refer to black water as sustainable human waste and organic waste management practices do not involve the use of water.

***Best Practices:***

Water used in the preparation of food, in the washing of dishes or clothing, or any other type of water containing organic particles should be strained before being disposed. The resulting water should be disposed of at least 100 metres away from any body of water. Organic waste removed from the water should be managed as per *Section 2.11. (Organic Waste Management)*.

It is important to note that waste water should be adequately disposed of immediately following use, to avoid freezing, which would compromise the proper disposal of grey water.

***Unsustainable Practices:***

The disposal of waste water not previously strained should be avoided. The disposal of waste water, whether strained or not, should also be avoided in, or in the proximity of, any body of water whatsoever.

## **2.13. General Waste Management**

This section applies to all other non-organic, non-human and non-water waste, including but not limited to plastic, containers, packaging, oil, fuel etc...

***Best Practices:***

No waste whatsoever should be disposed of in the Arctic environment. As a result, all waste must be stored in designated containers, and removed from the site upon vacation for disposal in a landfill.

***Unsustainable Practices:***

The burning or burying of waste must be avoided.

## **2.14. Local Area Travel**

Soil and vegetation damage, direct pollution, and disturbances to wildlife, along with long-term impact, including greenhouse gas emissions, should be avoided.

***Best Practices:***

The best method of transportation for local travel when practical is by foot, ski or snow shoes. Pulling a personal sled is also an option.

***Acceptable Practices:***

Human powered travel may not always be possible. In such cases, the preferred method of transporta-

tion is by sea or by air. Planes, helicopters or ice breakers may be used to carry equipment, supplies and people.

In order to prevent soil damage, the landing site should be carefully selected to ensure it is frozen, and covered with as much ice and/or snow as possible. Areas that are frozen but with exposed vegetation should be avoided.

Any landing should also be conducted in an area away from any sign of wildlife to prevent undue stress to the fauna.

Although greenhouse gas emissions are inherent to mechanized travel, they can be minimized through the use of more fuel efficient aircraft and ships, as well as through the reduction of cargo through proper expedition planning and careful gear selection.

***Unsustainable Practices:***

The use of snowmobiles may be considered as a last resort, due to their high impact on the environment. Tracks will often damage soil underneath thin layers of snow or ice, mechanical noises will cause stress to wildlife, and emissions will generate high amount of greenhouse gas.

In order to minimize soil and vegetation damage, travel on thick layers of snow and ice is best. Extreme care should be taken in filling fuel tanks in order to avoid spillage. Wildlife corridors, or any area occupied by wildlife should be avoided. Lastly, greenhouse gas emissions should be reduced through the use of more recent, more fuel efficient machines, and a reduction in gear, equipment and supplies being transported.

## **2.15. Wildlife Management**

Polar bears are an important consideration in an Arctic environment, as they may actively hunt humans for food. Several steps should therefore be taken in order to avoid direct conflicts, and thus, the possibility of having to shoot a bear.

***Best Practices:***

Bears have a highly developed sense of smell. Any type of smell or scent on humans and on the camp site should therefore be minimized.

Waste should be managed and stored away from sleeping quarters as per *Section 2.10. (Human Waste Management)*, *2.11. (Organic Waste Management)*, *2.12. (Waste Water Management)*, and *2.13. (General Waste Management)*. Dry foods, versus fresh foods and meats should be selected. Re-hydrating food with boiling water versus cooking on an open fire is also preferable.

The use of scented cosmetics should be avoided. Colognes and perfumes should be banned from the camp. Soaps, shampoos, deodorants and toothpastes should be unscented whenever possible. Human odours should also be avoided through excellent hygiene practices, including the mandatory use of unscented deodorants.

Sanitary napkins should be handled like any other waste product, and used sanitary napkins should never be stored in sleeping quarters.

In order to prevent bears from entering the camp site, the whole perimeter of the camp site should be fenced with an electrical fence. It is to be noted however that the operation of battery operated fences at very low temperatures may be problematic.

Any bears spotted in the vicinity of the site should be scared away by any available non-lethal means, including the discharge of firearms or noise makers.

Polar bear migrations should also be taken into consideration at the planning stage of the expedition.

Other wildlife, such as foxes, wolves, muskoxen, caribou, wolverine, lemming, or snowshoe hare, typically do not present a danger to humans, as long as interaction is avoided. No wildlife should ever be fed, and any interaction should be avoided.

***Unsustainable Practices:***

Destroying wildlife as a method of preventing conflicts with humans should be used only as a last resort, and preserving wildlife is an integral part of environmentally sustainable practices.

## **2.16. Dismantling Camp**

Dismantling camp should essentially consist in packing out everything that was packed in. This includes all human waste, organic waste and other waste, with the exception of strained grey water as per *Section 2.12. (Waste Water Management)*.

Nothing should be left behind, including wood, paper, bones or any other material or substance not originally present on the site. The goal is to leave the camp site as pristine as it was originally, without any trace of a human presence.

## **2.17. Environmental Impact Self Assessment**

This questionnaire will allow you to assess whether your practices meet sustainable environmental standards outlined in this guide.

Please select one answer only for each question.

### **1. With respect to the preparation of the expedition:**

- A. You have designated a Team Leader, responsible for the briefing and compliance of all members of the expeditions with sustainable environmental practices. *(10 points)*
- B. You have not designated a Team Leader, but members of the expeditions have been made aware of the sustainable environmental practices contained in this guide. *(5 points)*
- C. You have not designated a Team Leader, and members of the expeditions have not been briefed about sustainable environmental practices. *(0 points)*
- D. None of the above. *(0 points)*

### **2. With respect to equipment and clothing, you intend to:**

- A. Bring adequate clothing for the Arctic, in order to avoid reliance on artificial sources of heat, and use good quality, reliable equipment designed to last for many more expeditions. *(10 points)*
- B. Bring inadequate clothing for the Arctic, and/or equipment that is not designed to be durable. *(0 points)*
- C. Pack light as far as clothing is concerned, as you will be using alternate sources of heat, and use disposable equipment, or equipment designed to last only for this expedition. *(0 points)*
- D. None of the above. *(0 points)*

**3. How will you reach the site of the expedition?**

- A. By foot and/or human-pulled sled. *(10 points)*
- B. By air, sea, or by dog sled. *(5 points)*
- C. By snowmobile. *(0 points)*
- D. None of the above. *(0 points)*

**4. How do you intend to select your base/camp site?**

- A. We will select a site with thick ice and/or snow, without apparent vegetation, away from any wildlife corridor, and within walking distance from a source of water. *(10 points)*
- B. We will select a site with thick ice and/or snow, without apparent vegetation, away from any wildlife corridor, but far from a source of water. *(5 points)*
- C. We will select a site that is most convenient for us, whether it is covered by ice and/or snow, and/or vegetation, and whether it interferes with a wildlife corridor, and/or is in proximity of a body of water. *(0 points)*
- D. None of the above. *(0 points)*

**5. How will you set up your camp?**

- A. We will build igloos, or have igloos built, for all our needs. *(10 points)*
- B. We will set small tents as needed. *(5 points)*
- C. We will set temporary structure designed to accommodate our whole party. *(0 points)*
- D. None of the above. *(0 points)*

**6. What type of food will you be using, and how will you be preparing it?**

- A. We will use dehydrated foods, as per our nutritional needs, prepared with water heated on fuel or propane stoves. *(10 points)*
- B. We will eat as much dehydrated food as we want, even if our food intake exceeds our nutritional needs, and/or we will eat fresh foods and meat, prepared on fuel or propane stoves. *(5 points)*
- C. We will prepare fresh foods and meats on open fires. *(0 points)*
- D. None of the above. *(0 points)*

**7. How will you obtain drinking water?**

- A. We will use lake water, and/or melt apparently clean ice and/or snow, and boil it for 5 minutes. *(10 points)*
- B. We will melt ice and/or snow and use water purification tablets. *(5 points)*
- C. We will bring our own water. *(0 points)*
- D. None of the above. *(0 points)*

**8. How will you ensure you maintain a high level of personal hygiene?**

- A. We will use wipes whenever possible, as well as biodegradable fluoride-free toothpaste. (10 points)
- B. We will perform sponge baths with biodegradable soap whenever necessary, and/or use regular toothpaste. (5 points)
- C. We will find a way to take showers as needed. (0 points)
- D. None of the above. (0 points)

**9. How do you intend to go to the bathroom?**

- A. We will use WAG bags. (10 points)
- B. We will use WAG bags whenever possible and while at camp, but we will urinate in the wild whenever practical. (5 points)
- C. We will use a latrine, or a hole in the ground, or some type of compost toilets. (0 points)
- D. None of the above. (0 points)

**10. How will you deal with organic wastes?**

- A. We will pack them, and take them with us when we leave, like everything else. (10 points)
- B. We will burn them. (0 points)
- C. We will bury them in the ground or leave them somewhere in the area. (0 points)
- D. None of the above. (0 points)

**11. How will you handle grey water, or waste water from cleaning dishes, washing clothes, or personal hygiene?**

- A. We will strain all organic matters from the water, pack the organic wastes, and drain the remaining water away from our living quarters, and at least 100 metres away from any body of water. (10 points)
- B. We will strain all organic matters from the water, pack the organic wastes, and drain the remaining water wherever is we can, even if it is close to, or in a body of water. (5 points)
- C. We will get rid of the waste water without draining it first, and/or in proximity of a body of water. (0 points)
- D. None of the above. (0 points)

**12. How will you handle all other waste, such as packaging, containers, bones etc...?**

- A. We will pack all wastes and take them with us upon leaving camp for proper disposal in a designated landfill. (10 points)
- B. We will burn all organic waste, and take the rest of the refuse with us upon vacating the camp. (0 points)
- C. We will bury some or all of the wastes as we cannot really take them with us. (0 points)
- D. None of the above. (0 points)

**13. How will you travel locally?**

- A. We will travel by foot, snowshoes or skis. (10 points)
- B. We will travel by air and/or sea. (5 points)
- C. We will travel by snowmobile. (0 points)
- D. None of the above. (0 points)

**14. How will you handle wildlife, more specifically polar bears?**

- A. We will place an electric fence around the camp, and minimize all smells that could attract bears, including food, cosmetics, refuse and human scents. *(10 points)*
- B. We will place an electric fence around the camp, but will not really be able to minimize smells. *(5 points)*
- C. We will carry firearms so we can shoot any bear that gets too close to camp. *(0 points)*
- D. None of the above. *(0 points)*

**15. How will you dismantle the camp?**

- A. We will pack out everything we packed in, no exception. *(10 points)*
- B. We will pack out almost everything, with the exception of natural items such as wood or paper. *(5 points)*
- C. We will pack out what we can, and leave the rest behind. *(0 points)*
- D. None of the above. *(0 points)*

Now, please add the listed points for each answer (remember, only one answer per question).

A score of 110 or above confirms that your practices will generally comply with the sustainable environmental guidelines outlined in this guide. As a result, you may be confident that your expedition will have a limited impact on the environment.

The closer your score is to 150, the more compliant and the most environmentally sustainable your expedition will be.

Any score below 110 means that your expedition will have an impact on the environment, and will not meet many of the fundamental sustainable environmental guidelines listed in this guide.

## 3. SUMMER EXPEDITIONS

### 3.1. Overview

This section provides sustainable environmental practices for any expedition conducted in summer in an Arctic environment. For the purpose of this guide, summer is defined as any period during which the ground is bare and not covered with ice or snow. Expeditions occurring in September for example would therefore be considered summer expeditions. The goal of the practices outlined in this section is to minimize the human impact on the highly sensitive Arctic environment.

It is important to note that practices deemed to be *Best Practices* for winter expeditions, may become *Acceptable Practices* in a summer environment.

The environmental impact of camping in the Arctic is greatly increased in summer due to the sensitive permafrost and plant life. Setting up tents, trekking, or landing craft is inherently more damaging in summer. Conducting expeditions in summer should therefore be avoided whenever possible.

### 3.2. Preparation

A *Team Leader* should be designated and should be responsible for the implementation of the sustainable environmental practices contained in this guide. All members of the expedition should be briefed and trained in summer specific sustainable practices. They should understand that sustainable environmental practices are everyone's responsibility.

Policies should also be implemented to ensure all members of the expedition are adequately dressed for the elements, and a minimum equipment list should be provided to avoid the need for fuel heating or even rescue.

Expedition members should also be trained in the operation of the various pieces of equipment being used, and should understand that equipment such as stoves, manual tools, batteries, and electronics will have temperature and operational limitations.

### 3.3. Equipment and Clothing

#### ***Best Practices:***

The use of quality, reliable and durable equipment is recommended for any Arctic expedition. Equipment failure may lead to various problems, from the need to use artificial sources of heat (inherently unsustainable), overheating and dehydration, to injuries and even the possibility of requiring a rescue.

Weight and volume of equipment is also a major consideration, since it will dictate the method of transportation to be used, the practicality of travel by foot, as well as possible greenhouse gas emissions.

In order to keep warm or cool as required, to avoid the use of fossil fuels for heat, and to avoid excessive use of water for personal hygiene due to excessive perspiration, appropriate clothing should be used. This includes synthetic sleeping bags, footwear, warm underwear, layered clothing, soft shells, and outer shells rated for mild to cold weather.

***Unsustainable Practices:***

Using inadequate clothing, or equipment that is designed to be disposable is strongly discouraged. Inappropriate clothing besides potentially leading to a life threatening situation could also lead to the need for a rescue, and therefore, undue environmental stress. Failing equipment may also result in a similar situation while generating more waste.

### **3.4. Transportation to Site**

Several factors need to be taken into consideration when selecting a transportation method to a given site. Immediate impact, such as soil and vegetation damage, direct pollution, and disturbances to wildlife, along with long-term impact, including greenhouse gas emissions, shall be addressed.

***Best Practices:***

The best method of transportation during the summer months, when the ground is bare, is by sea or by air. Planes, helicopters or boats/ships may be used to carry equipment, supplies and people.

***Acceptable Practices:***

For short distances, and when the use of air or sea transportation is impossible or impractical, travel may be by foot. In such case, members of the expedition should trek over a wide area side by side rather than in single file. A plant that has been stepped on once has a greater chance of recovery than one that has been stepped on repeatedly. Whenever possible, travel should also be conducted over rocky areas, in contrast to areas covered with vegetation.

***Unsustainable Practices:***

The use of ATV's or 4x4 vehicles should be strongly discouraged as they will result in substantial damage on the vegetation and soil.

### **3.5. Site Selection**

***Best Practices:***

It is important to ensure that the camp site is established within walking distance, but at least 100 metres from a body of water. In most areas, precipitation in the Arctic in summer is usually minimal, and should not be relied on for fresh water needs.

The camp site should be located in an area sheltered from the wind if at all possible, while ensuring it is not exposed to potential rock or land slides. The site should also be level, as traffic over sloped areas

may destabilize the permafrost, potentially leading to landslides.

Rocky areas should be selected, and areas covered with vegetation should be avoided. If rocks must be removed in order to set up camp, they should be replaced in their original position upon departure.

The selected site should be close to any area to be explored to avoid unnecessary travel.

Although it may be difficult to determine, try to avoid wildlife corridors to avoid unnecessary wildlife conflicts.

***Acceptable Practices:***

Selecting a site far from a source of water may be acceptable if no suitable site can be found in proximity to a source of water. However, it is important that all members of the camp are physically capable of walking to a water source without the aid of mechanized travel.

***Unsustainable Practices:***

Establishing camp on exposed vegetation, on a slope, in a wildlife corridor, and too far from a source of water should be avoided.

### **3.6. Camp Set up and Maintenance**

A camp site should be set up and maintained to ensure that there is no trace of any human presence or environmental damage whatsoever upon vacation.

***Best Practices:***

Tents with a capacity of 3 people should always be used to minimize total foot print of the tent, while providing the potential for body heat exchange. Such tents should however only be occupied by two individuals in order to allow for the storage of personal equipment, as equipment weight will contribute to anchoring the tent on the ground, and minimize the use and depth of pegs or other anchoring devices. Storage of personal equipment in the tent should under no circumstances include food, drinks (with the exception of water), or toiletry items to prevent any wildlife conflict.

A larger dome-style tent may be used as a common/cooking area. An extra 3-person tent may be used as a bathroom and washroom.

The tent sites should always be in a rocky area, and away from any section of exposed vegetation. Spacing between tents should be based on practical need and kept to a minimum to reduce the size of the camp.

***Acceptable Practices:***

If the camp must be set on vegetation, each tent should be moved every day to avoid melting of the permafrost, damage to the vegetation, and compaction of soil.

***Unsustainable Practices:***

The use of large temporary shelters designed to accommodate larger groups of people should be discouraged, as they will most likely impact the plant life, as well as damage soil due to their larger foot print.

### 3.7. Food and Nutrition

Food supplies should be sufficient to fulfill the nutritional needs of each expedition member, while avoiding overeating, which will produce a higher amount of waste, and will have a potentially negative impact on the environment. Caloric expenditure should be determined on a daily basis, and the amount of food packed assessed accordingly, taking into consideration reserve supplies in case of emergency, isolation, or delayed pick up.

#### ***Best Practices:***

Freeze dried foods should always be used for hot entrees. Nuts, beef jerky, dried fruits and other dry products are also recommended. Water should be heated on a fuel or propane stove. Food should be consumed directly from the individual pouches to avoid the use of dishes as much as possible. Unconsumed food should be handled as per *Section 3.11. (Organic Waste Management)*, while food pouches are managed as per *Section 3.13. (General Waste Management)*.

Utensils and any dishes should be washed using a minimum amount of water and biodegradable soap, and the resulting waste should be handled as per *Section 3.11. (Organic Waste Management)*, and *Section 3.12. (Waste Water Management)*.

#### ***Unsustainable Practices:***

The use of fires to either boil water or cook meats and other meals should be avoided and only reserved for emergency situations. Perishable food items should be avoided, as well as food packaging that cannot be compacted after use.

### 3.8. Drinking and Cooking Water

#### ***Best Practices:***

Drinking water should be obtained by filtering the water resulting directly from a clean source of fresh water.

#### ***Acceptable Practices:***

Water purification tablets may be used, as long as tablets and tablet residues are not disposed of in the environment and are handled like any waste as per *Section 3.13. (General Waste Management)*.

#### ***Unsustainable Practices:***

Bringing supplies of fresh water is strongly discouraged due to the resources and energy required for transportation. Heating and boiling water for sterilization purposes in summer must be discouraged.

### 3.9. Personal Hygiene

Personal hygiene in a camp environment is important both for individuals and the camp as a whole. Each expedition member should be responsible for his or her own hygiene, and comply with proper waste management guidelines as outlined in *Sections 3.10. (Human Waste Management) and 3.11. (Organic Waste Management)*.

In order to avoid cross contamination of food with waste, it is recommended that each person be responsible for the preparation of their own meals, and that meals be prepared away from any waste.

#### **Best Practices:**

Personal hygiene is carried out with as little water as possible and unscented sanitary wipes are a practical way of maintaining hygiene while allowing waste to be carried out. Using deodorant alternatives such as a salt crystal in odour causing areas of the body will actually prevent the development of odour causing bacteria and can reduce the frequency of bathing. Oral hygiene should be attended with an all-natural ingredient toothpaste or biodegradable toothpaste, free of fluoride, and ensure that any by-product of teeth cleaning is not disposed of into the environment and is managed as per *Section 3.12. (Waste Water Management)*.

#### **Acceptable Practices:**

Use sponges, water and biodegradable soap as a means of bathing instead of wipes. Soiled or waste water can be poured into the ground away from the camp site, but never into, or in proximity of, any body of water. Oral hygiene is maintained with a natural ingredient or biodegradable toothpaste, and the rinse water should be disposed of away from camp into the ground, but never into a body of water.

#### **Unsustainable Practices:**

As a last resort, an outdoor shower may be set up; however the temperature of the water must not exceed a temperature that would be detrimental to flora or fauna under the shower, or draining away from a shower. Runoff from a shower must not directly drain into a stream or body of water and must first be absorbed into the ground. Biodegradable soap and all-natural ingredient toothpaste or biodegradable toothpaste must be used and can be disposed of in an area away from the camp and into the ground, never into a body of water.

### 3.10. Human Waste Management

Human waste, especially urine, have been found to contain traces of many chemicals, medicine and other compounds, linked to a wide array of environmental ailments, including interference with the reproductive process of various species. Human waste such as excrement also have the potential to introduce excess nutrients to an eco-system, thereby affecting the balance of the sensitive Arctic environment. With this in mind, contamination of a site with human waste should be avoided.

#### **Best Practices:**

Urination and defecation, as well as toilet paper and personal wipes, should be contained in specifically designed bags, such as WAG bags. These individual bags will solidify the waste, remove odours, and

accelerate bacterial break down. Used bags are then to be safely stored in designated waste containers, and removed from the site upon vacation for appropriate disposal in a landfill.

***Unsustainable Practices:***

The use of latrines, portable composting toilets, or holes dug in the soil or snow should be avoided. Bacterial breakdown will indeed take much longer in the Arctic than in any other environment. Additionally, such practices do not prevent soil and water contamination with the chemicals, medicines and other compounds found in human waste. It is also evident that such practices will leave substantial traces of human presence for extended periods of time.

### **3.11. Organic Waste Management**

The disposal of organic waste, such as food waste, in an Arctic environment may result in the addition of excess nutrients to the eco-system, and thus, may result in adverse effects on the environment. No organic waste should be released into the environment.

***Best Practices:***

Each individual should endeavour to minimize waste from food by ensuring adequate portions based on nutritional needs. Any organic waste should be packed in biodegradable, non-paper bags, and then be stored in designated waste containers. Such containers should later be removed from the site upon vacation, and disposed of in a designated landfill.

***Unsustainable Practices:***

The disposal of organic waste in the environment is not encouraged. As with human waste, bacterial breakdown will take longer in the Arctic than other environments. Such practices will also leave substantial traces of human presence for extended periods of time.

### **3.12. Waste Water Management**

This section only covers the management of grey water, namely water used in the preparation of foods, washing of clothes and dishes, or for personal hygiene if applicable. It does not refer to black water as sustainable human waste and organic waste management practices do not involve the use of water.

***Best Practices:***

Water used in the preparation of food, in the washing of dishes or clothing, or any other type of water containing organic particles should be strained before being disposed. The resulting water should be disposed of at least 100 metres away from any body of water. Organic waste removed from the water should be managed as per *Section 3.11. (Organic Waste Management)*.

***Unsustainable Practices:***

The disposal of waste water not previously strained should be avoided. The disposal of waste water, whether strained or not, should also be avoided in, or in the proximity of, any body of water whatsoever.

### **3.13. General Waste Management**

This section applies to all other non-organic, non-human and non-water wastes, including but not limited to plastic, containers, packaging, oil, fuel etc...

#### ***Best Practices:***

No waste whatsoever should be disposed of in the Arctic environment. As a result, all waste must be stored in designated containers, and removed from the site upon vacation for disposal in a landfill.

#### ***Unsustainable Practices:***

The burning or burying of waste must be avoided.

### **3.14. Local Area Travel**

Soil and vegetation damage, direct pollution, and disturbances to wildlife, along with long-term impact, including greenhouse gas emissions, should be avoided.

#### ***Best Practices:***

The best method of transportation for local travel is by foot. Travel should be conducted on rocky terrain whenever possible.

#### ***Acceptable Practices:***

If travel must be conducted on non-rocky terrain, members of the expedition should trek over a wide area as to prevent repetitive damage on the permafrost or vegetation. As an alternative, travel by air or boat/ship may be considered.

#### ***Unsustainable Practices:***

The use of ATV's or 4x4 vehicles must be avoided due to their devastating impact on the permafrost and vegetation.

### **3.15. Wildlife Management**

Polar bears are an important consideration in an Arctic environment, as they may actively hunt humans for food. Grizzly bears and black bears may also be present at lower latitudes, although they typically do not actively hunt humans. Several steps should therefore be taken in order to avoid direct conflicts, and thus, the possibility of having to shoot a bear.

**Best Practices:**

Bears have a highly developed sense of smell. Any type of smell or scent on humans and on the camp site should therefore be minimized.

Waste should be managed and stored away from sleeping quarters as per *Section 3.10. (Human Waste Management)*, *3.11. (Organic Waste Management)*, *3.12. (Waste Water Management)*, and *3.13. (General Waste Management)*. Dry foods, versus fresh foods and meats should be selected. Re-hydrating food with boiling water versus cooking on an open fire is also preferable.

The use of scented cosmetics should be avoided. Colognes and perfumes should be banned. Soaps, shampoos, deodorants and toothpastes should be unscented whenever possible. Human odours should also be avoided through excellent hygiene practices, including the mandatory use of unscented deodorants or salt crystals.

Sanitary napkins should be handled like any other waste product, and used sanitary napkins should never be stored in sleeping quarters.

In order to prevent bears from entering the camp site, the whole perimeter of the camp site should be fenced with an electrical fence. Any bears spotted in the vicinity of the site should be scared away by any available non-lethal means, including the discharge of firearms or noise makers.

Polar bear migrations should also be taken into consideration at the planning stage of the expedition.

Other wildlife, such as foxes, wolves, muskoxen, caribou, wolverine, lemming, snowshoe hare, typically do not present a danger to humans, as long as interaction is avoided. No wildlife should ever be fed, and any interaction should be avoided.

**Unsustainable Practices:**

Destroying bears as a method of preventing conflicts with humans should be used only as a last resort, as preserving wildlife is an integral part of environmentally sustainable practices.

**3.16. Insect Management****Best Practices:**

Mosquitoes and black flies are attracted to dark colours as they reflect heat. They are also attracted to scents. As a result, clothing should be light coloured to avoid attracting the insects, and the use of fragrance free soaps and deodorants should be encouraged. Skin exposure should be limited as much as possible, with pants tucked in socks, and shirts tucked in pants (the use of shorts is discouraged). Loose layered clothing should be selected, and loose weave technical fabrics should be avoided as they will allow insect bites through the fabric. Full insect suits/nets should be worn for best protection.

Planning an expedition in September may also minimize insect nuisance, which is usually worse at high latitudes at the beginning of summer.

**Unsustainable Practices:**

The use of DEET is strongly discouraged as this chemical compound is a carcinogen with severely adverse effects on the environment.

DEET will prevent insects from biting, but it will not prevent them from landing on exposed skin and in orifices. Additionally, the effects of DEET will decrease after 45 to 120 minutes depending on the concentration; this will require frequent re-applications, and make DEET impractical for protection against insects.

### 3.17. Dismantling Camp

Dismantling camp should essentially consist of packing out everything that was packed in. This includes all human waste, organic waste and other waste, with the exception of strained grey water as per *Section 3.12. (Waste Water Management)*.

Nothing should be left behind, including wood, paper, bones or any other material or substance not originally present on the site. The goal is to leave the camp site as pristine as it was originally, without any trace of a human presence.

### 3.18. Environmental Impact Self Assessment

This questionnaire will allow you to assess whether your practices meet sustainable environmental standards outlined in this guide.

Please select one answer only for each question.

#### 1. With respect to the preparation of the expedition:

- A. You have designated a Team Leader, responsible for the briefing and compliance of all members of the expeditions with sustainable environmental practices. *(10 points)*
- B. You have not designated a Team Leader, but members of the expeditions have been made aware of the sustainable environmental practices contained in this guide. *(5 points)*
- C. You have not designated a Team Leader, and members of the expeditions have not been briefed about sustainable environmental practices. *(0 points)*
- D. None of the above. *(0 points)*

#### 2. With respect to equipment and clothing, you intend to:

- A. Bring adequate clothing for the Arctic, in order to avoid reliance on artificial sources of heat or to prevent overheating, and use good quality, reliable equipment designed to last for many more expeditions. *(10 points)*
- B. Bring regular clothing not necessarily designed to protect against the elements and/or equipment not designed to be durable. *(0 points)*
- C. Pack light as far as clothing is concerned, as you will be using alternate sources of heat, and use disposable equipment, or equipment designed to last only for this expedition. *(0 points)*
- D. None of the above. *(0 points)*

**3. How will you reach the site of the expedition?**

- A. By air or by sea. *(10 points)*
- B. By foot. *(5 points)*
- C. By ATV or 4x4 vehicle. *(0 points)*
- D. None of the above. *(0 points)*

**4. How do you intend to select your base/camp site?**

- A. We will look for a flat, rocky area, without vegetation, away from any wildlife corridor, and within walking distance from a water source. *(10 points)*
- B. We will look for a flat, rocky area, without vegetation, away from any wildlife corridor, but not within walking distance from a water source. *(5 points)*
- C. We will select a site that is most convenient for us, whether it is flat, rocky, and/or covered with vegetation, and/or whether it interferes with a wildlife corridor, or is in proximity of a body of water. *(0 points)*
- D. None of the above. *(0 points)*

**5. How will you set up your camp?**

- A. We will set small tents on rocky areas as needed. *(10 points)*
- B. We will set small tents on vegetation as needed, and will rotate the tents every day. *(5 points)*
- C. We will set temporary structure designed to accommodate our whole party. *(0 points)*
- D. None of the above. *(0 points)*

**6. What type of food will you be using, and how will you be preparing it?**

- A. We will use dehydrated foods, as per our nutritional needs, prepared with water heated on fuel or propane stoves. *(10 points)*
- B. We will eat as much dehydrated food as we want, even if our food intake exceeds our nutritional needs, and/or we will eat fresh foods and meat, prepared on fuel or propane stoves. *(5 points)*
- C. We will prepare fresh foods and meats on open fires. *(0 points)*
- D. None of the above. *(0 points)*

**7. How will you obtain drinking water?**

- A. We will use water filters. *(10 points)*
- B. We will use water purification tablets. *(5 points)*
- C. We will boil water and/or bring our own water supply. *(0 points)*
- D. None of the above. *(0 points)*

**8. How will you ensure you maintain a high level of personal hygiene?**

- A. We will use wipes whenever possible, as well as biodegradable fluoride-free toothpaste. *(10 points)*
- B. We will perform sponge baths with biodegradable soap whenever necessary, and/or use regular toothpaste. *(5 points)*
- C. We will find a way to take showers as needed. *(0 points)*
- D. None of the above. *(0 points)*

**9. How do you intend to go to the bathroom?**

- A. We will use WAG bags. *(10 points)*
- B. We will use WAG bags whenever possible and while at camp, but we will urinate in the wild whenever practical. *(5 points)*
- C. We will use a latrine, or a hole in the ground, or some type of compost toilets. *(0 points)*
- D. None of the above. *(0 points)*

**10. How will you deal with organic wastes?**

- A. We will pack them, and take them with us when we leave, like everything else. *(10 points)*
- B. We will burn them. *(0 points)*
- C. We will bury them in the ground or leave them somewhere in the area. *(0 points)*
- D. None of the above. *(0 points)*

**11. How will you handle grey water, or waste water from cleaning dishes, washing clothes, or personal hygiene?**

- A. We will strain all organic matters from the water, pack the organic wastes, and drain the remaining water away from our living quarters, and at least 100 metres away from any body of water. *(10 points)*
- B. We will strain all organic matters from the water, pack the organic wastes, and drain the remaining water wherever is we can, even if it is close to, or in a body of water. *(5 points)*
- C. We will get rid of the waste water without draining it first, and/or in proximity of a body of water. *(0 points)*
- D. None of the above. *(0 points)*

**12. How will you handle all other waste, such as packaging, containers, bones etc...?**

- A. We will pack all wastes and take them with us upon leaving camp for proper disposal in a designated landfill. *(10 points)*
- B. We will burn all organic waste, and take the rest of the refuse with us upon vacating the camp. *(0 points)*
- C. We will bury some or all of the wastes as we cannot really take them with us. *(0 points)*
- D. None of the above. *(0 points)*

**13. How will you travel locally?**

- A. We will travel by foot over rocky terrain. *(10 points)*
- B. We will travel by foot over vegetation, with our group spread over a wide area, or we will travel by air and/or sea. *(5 points)*
- C. We will travel by ATV and/or 4x4 vehicle. *(0 points)*
- D. None of the above. *(0 points)*

**14. How will you handle wildlife, more specifically polar bears?**

- A. We will place an electric fence around the camp, and minimize all smells that could attract bears, including food, cosmetics, refuse and human scents. *(10 points)*
- B. We will place an electric fence around the camp, but will not really be able to minimize smells. *(5 points)*
- C. We will carry firearms so we can shoot any bear that gets too close to camp. *(0 points)*
- D. None of the above. *(0 points)*

**15. How will you manage insects?**

- A. We will use insect suits/nets. *(10 points)*
- B. We will use a combination of nets and insect repellent containing DEET. *(5 points)*
- C. We will primarily use DEET. *(0 points)*
- D. None of the above. *(0 points)*

**16. How will you dismantle the camp?**

- A. We will pack out everything we packed in, no exception. *(10 points)*
- B. We will pack out almost everything, with the exception of natural items such as wood or paper. *(5 points)*
- C. We will pack out what we can, and leave the rest behind. *(0 points)*
- D. None of the above. *(0 points)*

Please add the listed points for each answer (remember, only one answer per question).

A score of 120 or above confirms that your practices will generally comply with the sustainable environmental guidelines outlined in this guide. As a result, you may be confident that your expedition will have a limited impact on the environment.

The closer your score is to 160, the more compliant and the most environmentally sustainable your expedition will be.

Any score below 120 means that your expedition will have an impact on the environment, and will not meet many of the fundamental sustainable environmental guidelines listed in this guide.

### 3. SUPPLIER LIST

#### **Extreme Cold Parkas**

*Canada Goose*

<http://www.Canada-Goose.com>

#### **Extreme Cold Footwear**

*Sorel Boots*

<http://www.sorel.com>

#### **Outdoor Equipment**

*Mountain Equipment Co-Op*

<http://www.mec.ca>

#### **Freeze-Dried Food**

*Backpacker's Pantry*

<http://www.backpackerspantry.com/>

#### **High Protein Dog Food**

*Innova Evo*

<http://www.naturapet.com>

#### **Water Filters**

*Katadyn*

<http://www.katadyn.com>

#### **Biodegradable Soaps and Fluoride-free Toothpaste**

*Mountain Equipment Co-Op*

<http://www.mec.ca>

#### **WAG Bag and Portable Dry Toilet Systems**

<http://www.thepett.ca/products/wag.html>

#### **Portable Electrical Fences**

[http://www.gallagher.ca/fence\\_components.aspx](http://www.gallagher.ca/fence_components.aspx)

<http://www.udap.com/bearshock.htm>

<http://www.waterstrider.com/bear-repellent-portable-electric-fence.htm>

#### **Bear Resistant Containers**

*Garcia Machines*

<http://www.backpackerscache.com>

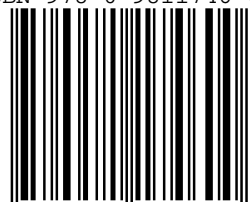
#### **Expedition Cases**

*Pelican Cases*

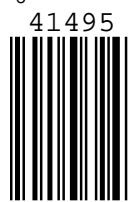
<http://www.pelican.ca>



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