

# Spill Contingency Plan for Mackay Lake Lodge

Version 1.3, Updated August 31, 2015

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## 1) Introduction and Project Details

True North Safaris Ltd., as the manager of Mackay Lake Lodge, has prepared this Spill Contingency Plan for the operation of their lodge at Mackay Lake, NT. This Plan demonstrates that we have the appropriate response capabilities and measures in place to effectively address potential spills at the Mackay Lake Lodge.

### i) Company name, site name, site location and mailing address

True North Safaris Ltd.  
Box 26, 132 Enterprise Drive  
YELLOWKNIFE NT X1A 2N1  
Phone: (867)873-8533  
Email: [gary@truenorthsafaris.com](mailto:gary@truenorthsafaris.com)

24 hour contact:

when the lodge is open 1 780 628 13 16

when lodge is not open 1 867 446 1074

President/General Manager: Gary Jaeb

### ii) Effective date of spill contingency plans

July 2, 2015

### iii) Last revisions to spill contingency plans

August 31, 2015 – Environment Canada phone number corrected on page 16.

### iv) Distribution list

The plan and most recent revisions is distributed to Mackay Lake Lodge personnel. The plan and revisions is also sent to the Mackenzie Valley Land and Water Board (MVLWB), and copied to the Lands Inspector. An extensive list of parties will receive the plan through the MVLWB distribution list.

### v) Purpose and scope

The purpose of this plan is to outline response actions for potential spills of any size, including a worst case scenario for Mackay Lake Lodge. The plan identifies key response personnel and their roles and

responsibilities in the event of a spill, as well as the equipment and other resources available to respond to a spill. It details spill response procedures that will minimize potential health and safety hazards, environmental damage, and clean-up efforts. The plan has been prepared to ensure quick access to all the information required in responding to a spill.

**vi) Company Environmental Policy**

True North Safaris Ltd has been managing Mackay Lake Lodge for going on 25 years. We are an environmentally friendly operation, with a number of qualified and experienced staff who have been doing a good job over a number of years and we will add the spill contingency awareness to the role of our camp staff and managers.

**vii) Project description**

Mackay Lake Lodge was first licensed in 1983 and the original Land Lease was acquired at that time by the Rocher, family from Yellowknife. In 1989 the lodge was purchased by Mackay Lake Lodge '89 Ltd with a group of shareholders from Behchoko, in the name of Sa Cho Developments Ltd ( Charlo, Zoe, Erasmus, Jaeb) and True North Safaris Ltd. ( Jaeb family) The original land lease covered the esker that the lodge buildings are on and in the 1990's a lease was acquired for the construction of an airstrip adjacent to the lodge lease. The lodge has operated for 30 years and employed about 30 seasonal workers until the closure of caribou sports hunting in 2009.

The management and marketing of the lodge had been contracted to True North Safaris Ltd. (TNS). The lodge is licensed for 24 guests, by the GNWT as a Tourist Establishment and carries a \$5,000,000 public liability insurance policy.

The Lodge facilities include a boat and float plane docking area, the row of guest cabins, staff quarters, kitchen/dining building, lounge/conference centre, workshops, storage facilities, outhouses, showers, laundry building and airstrip. We operate year round, during all seasons with ice road access, float planes and 3500 foot runway. The cost of the investment books at about, 1 million dollars, now depreciated, and represents the life savings of some of the shareholders.

**viii) Site description**

Mackay Lake Lodge is in the barren lands, adjacent to the Tibbit to Contwoyto ice road, on the south shore, about midway along the 100 mile (160 kilometer) long Mackay Lake about 150 air miles and 200 ice road miles, northeast of Yellowknife. The established site is completely away from the lake, on a side hill of the esker. The Lodge is located on AANDC lease no 75 M/15-1-16 and the airstrip is on lease no 75 M/15-3-5. The site is at 63° 51' N & 110° 35' W.

The attached map shows the north direction, location of spill kits at the boat house near the beach and garage/workshop near the runway and the fuel storage area on the apron of the runway



Below are three photos of Mackay Lake Lodge from the air.



**ix) List of hazardous materials on-site**

**Table 1: List of hazardous materials stored on-site, type of storage container, the normal and maximum storage quantities, and storage locations**

Material	Storage container	Normally On-site	Maximum On-site	Storage location and uses
Gasoline	20 x 200L barrels	10 to 20	50	Apron of runway
Diesel fuel	10x200L barrels	5 to 10	20	
Propane	5 x5000 gallon tanks	5 tanks on site Usually half full	five	3 near cabins 2 near the kitchen
Jet B fuel				
Av Gas				
Engine oil				Boat house

Material Safety Data Sheets (MSDS) for these materials are available in Appendix B.1.

**x) Existing preventative measures**

Planning for an emergency situation is imperative, due to the nature of the materials stored on site as well as the remoteness of the site. Along with the preventative measures outlined below, adequate training of staff and contractors is essential.

The equipment at the lodge includes catch tray containers that are used during fuel transfers and spill kits located at the boat house and the workshop to be used if a spill were to occur.

The lodge is equipped with ATVs & trailers and tractors with front end loaders and these could be used to create containment berms and remove and replace any contaminated material.

Fuel storage is in 45 gallon drums so that the likely hood of a major spill is very remote. In the event that there are 20 or more barrels of fuel to be stored onsite in one location, secondary containment will be implemented in the storage area, including an impermeable liner bordered by a berm.

Most of the buildings are heated with propane and 5 thousand gallon tanks are looped with underground piping. While no third party would do digging or construction without direction and oversight of Lodge staff, signage will be installed to indicate the location of underground piping to avoid incidents or damage. One guest cabin and three staff tent frames have oil fired space heaters. Catch trays will be installed under the tanks and the lines that supply the oil heaters will be wrapped with absorbing insulation.

At the west end of the lodge lease, the esker runs into the lake and forms a sheltered Bay where the boat and float plane dock, boat house and a guide cabin is located. At any given time, one or two drums of regular and mixed gasoline may be stored near the docks for refueling the boats. There are catch trays to be used when gasoline is being transferred to boat tanks and there is a spill kit at the boat house

should a spill occur. Occasionally aircraft are refuelled at the dock and Av Gas or Jet B is brought there from the storage area at the runway apron, only as needed.

At the east end of the lodge lease, near the apron of airstrip lease, there is a large flat area of esker that is used as a lay down and staging area for gasoline, diesel fuel and Av Gas and Jet B fuels. The lay down area is large and relatively flat, and is slightly sloped, away from the lake, ensuring that any spill could be contained and cleaned up and not get into the lake water.

**xi) Additional copies**

Copies of this spill contingency plan are to be kept at the Lodge location and at the Yellowknife head office. Additional copies may be obtained by contacting the True North Safaris Yellowknife office; contact information is available in section 1 i).

**xii) Process for staff response to media and public enquiries**

In the event that a response to media and public inquiries is required, all inquiries are to be directed to Gary Jaeb, the General Manager.

## **2) Response organization**

The guides and camp attendants carry mobile radios and the dining room, lounge, manager and staff quarters have base radios that are on 24/7. The managers' office has the intercom & marine base station plus the satellite phone and aircraft radios.

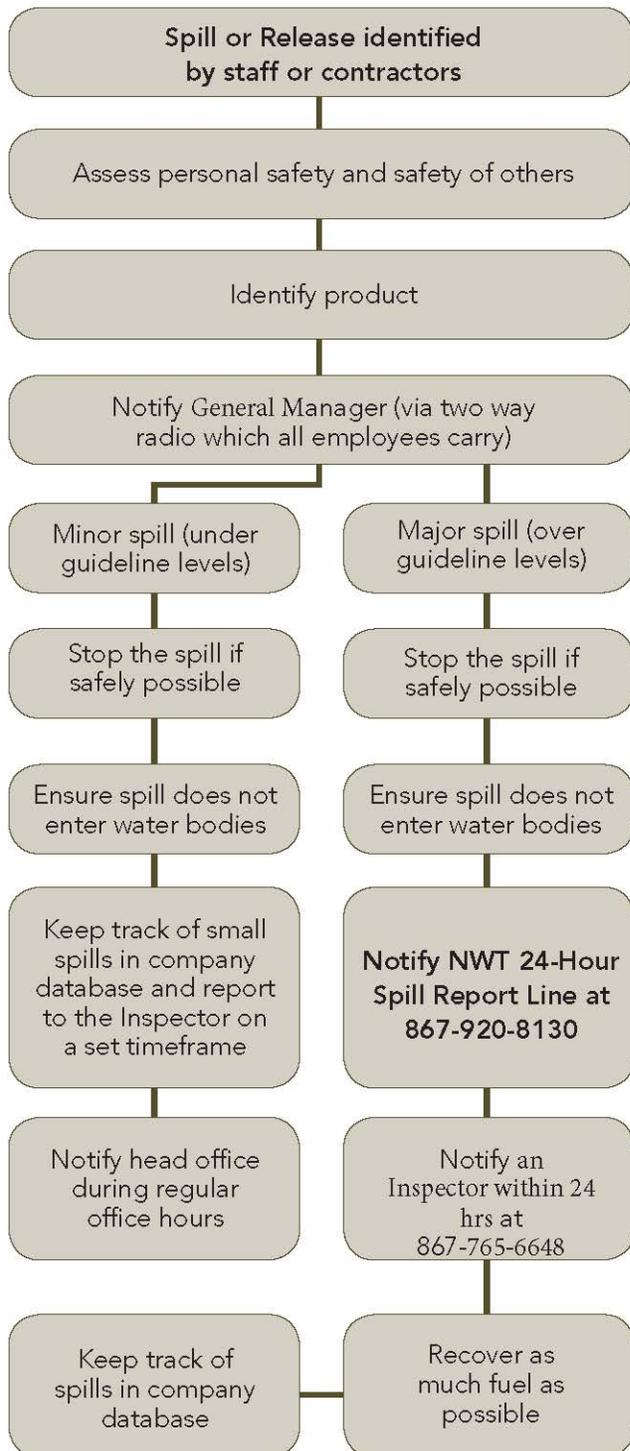
The camp staff involved in any spill would call the camp manager and if the spill was considered serious, a siren & general alert would be put out on the radio system including the aircraft frequency if the runway was affected.

The spill contingency plan is activated by the reporting in person, or by radio, of any spill to the General Manager. The General Manager would then take control and send out a general alert advising everyone on site of the location of the spill and any necessary safety precautions to be taken. Following the general alert, assistance at the spill site would be initiated to contain the spill, clean-up and properly store the contaminant so it is no longer a threat to the environment. Tractors/ATVs and or shovels and a spill kit would be dispatched to the spill site as necessary. A report would be called in to the 24-hour spill report line @ 1 867 920 8130.

Contaminated soil would be put into empty 45 gallon barrels and stored at the lay down area until the disposal method was determined in consultation with the Inspector.

Reports to the appropriate authorities would be made including the Lands Inspector.

**Figure 3: Flow chart of response organization (details of each step will be provided in the procedures for initial actions under Section 3 Action Plan)**



### 3) Action Plan

#### i) Potential spill sizes and sources for each hazardous material on site

In Table 2, a list of potential discharge events, with associated discharge volumes and directions is presented for the primary hazardous materials stored on site. The most likely discharge volume is indicated and the spill clean up procedures will focus on spills of this quantity. A worst case scenario is also presented. Specific discharge rates are not indicated for each fuel type as these would vary from a few minutes to several hours, based on the source of leak or puncture.

**Table 2: List of hazardous materials, potential discharge events, potential discharge volumes (worst case scenario in brackets) and direction of potential discharge**

Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Direction of Potential Discharge
Gasoline	Minor spill during refueling; minor leak from fuel drum; puncture in fuel drum; all drums punctured at once (very unlikely)	Likely under 200 L/ one drum complete leak is highly unlikely has never happened over 30 years	Fuel storage area is slopped away from the lake Fuel transfers involve manual operation and catch trays are being used
Diesel fuel	Minor spill during refueling; leaks from equipment; minor leak from fuel drum; puncture in fuel drum; all drums punctured at once (very unlikely)	Likely under 200 L/1 drum Refueling is always done by staff and a hose disconnect would be stopped before 5 litres max spilled	Manual operation using catch trays
Propane	Leak at connection; minor leaking cylinder; large puncture; or all cylinders punctured	Propane tanks are switched manually so only one at a time is used and the regulators close automatically if there is a leak or puncture, plus the propane evaporates	Propane evaporates
Jet B fuel	Minor spill during refueling; minor leak from fuel drum; puncture in fuel drum; all drums punctured at once (very unlikely)	The pilots do the aircraft refueling and shut off manually if there is a disconnect or spill	
Avgas	Minor spill during refueling; minor leak from fuel drum; puncture in fuel drum; all drums punctured at	Pilots refuel and shut off if a disconnect or spill were to occur	

	once (very unlikely)		
Engine oil	Minor spill during fluid transfer; minor spill due to machinery failure	Oil changes and top ups are done manually and spills are avoided and stopped and cleaned up	

**ii) Potential environmental impacts of spill (including worst case scenario)**

Overall for all hazardous materials discussed below, impacts are lower during winter as snow is a natural sorbent and ice forms a barrier limiting or eliminating soil or water contamination, thus spills can be more readily recovered when identified and reported.

**Gasoline**

Environmental impacts: Gasoline may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Gasoline is quick to volatilize. Runoff into water bodies must be avoided.

Worst case scenario: All fuel drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

**Diesel Fuel**

Environmental impacts: Diesel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Diesel burns slowly and thus risk to the environment is reduced during recovery as burn can be more readily contained compared with volatile fuels. Runoff into water bodies must be avoided.

Worst case scenario: All fuel drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

**Jet B Fuel**

Environmental impacts: Jet B fuel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Jet B fuel volatilizes relatively quickly. Runoff into water bodies must be avoided.

Worst case scenario: All fuel drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

## **Propane**

Environmental impacts: Propane may be harmful to wildlife and the surrounding environment. It has the potential to accumulate in the environment. Propane is extremely volatile and is the most flammable material stored on site, thus immediate impacts to the surrounding environment are a concern.

Worst case scenario: All cylinders were punctured or failed simultaneously and contents leaked into the surrounding environment and ignited leading to an explosion. This could cause serious environmental impacts in the immediate surroundings. Safety during emergency response to a propane spill is of the utmost concern.

## **Waste Oil and Miscellaneous Oils/Grease**

Environmental impacts: Waste oils may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Runoff into water bodies must be avoided.

Worst case scenario: All storage drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

## **iii) Procedures**

### **A. Procedures for initial actions**

- Ensure safety of all personnel.
- Assess spill hazards and risks.
- Remove all sources of ignition.
- Stop the spill if safely possible e.g. shut of pump, replace cap, tip drum upward, patch leaking hole. Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so. Tyvek suits and chemical master gloves are located in the spill kit and should be worn immediately if there is any risk of being in contact with fuel.
- No matter what the volume is, notify camp manager via two way radio (all employees carry these, as well as on-site contractors if they are not accompanied by an employee).
- Contain the spill – use contents of spill kits to place sorbent materials on the spill, or use shovel to dig dike to contain spill. Methods will vary depending on the nature of the spill. See Section C for more details.

### **B. Spill reporting procedures**

Report spill immediately to the General Manager, who will determine if spill is to be reported to the NWT 24-Hour Spill Line at 867-920-8130.

Each spill kit, as well as the Yellowknife office and General Manager, will have copies of the NWT Spill Report form to be filled out (see Appendix B-2). Fill out and fax or email the Spill Report to the staff of the NWT 24-Hour spill line. Also fax or email the report to the Yellowknife office.

NWT 24-Hour Spill Line  
Phone: (867) 920-8130

NWT 24-Hour Spill Line  
Fax: (867) 873-6924

NWT 24-Hour Spill Line  
Email: [spills@gov.nt.ca](mailto:spills@gov.nt.ca)

Yellowknife office, True North Safaris  
Phone: (867) 873-8533  
Yellowknife office, 24 hr phone line  
Phone: (867) 446 1074 when lodge is not open  
Phone: (780) 628 13 16 when the lodge is open

### **C. Procedures for containing and controlling the spill (e.g. on land, water, snow. etc.)**

- Initiate spill containment by first determining what will be affected by the spill.
- Assess speed and direction of spill and cause of movement (water, wind and slope).
- Determine best location for containing spill, avoiding any water bodies.
- Have a contingency plan ready in case spill worsens beyond control or if the weather or topography impedes containment.

**Specific spill containment methods for land, water, ice and snow are outlined below.**

#### 1) Containment of Spills on Land

Spills on land include spills on rock, gravel, soil and/or vegetation. It is important to note that soil is a natural sorbent, thus spills on soil are generally less serious than spills on water as contaminated soil can be more easily recovered. Generally spills on land occur during the late spring, summer or fall when snow cover is at a minimum. It is important that all measures be undertaken to avoid spills reaching open water bodies.

#### Dykes

Dykes can be created using soil surrounding a spill on land. These dykes are constructed around the perimeter or down slope of the spilled fuel. A dyke needs to be built up to a size that will ensure containment of the maximum quantity of fuel that may reach it. A plastic tarp can be placed on and at the base of the dyke such that fuel can pool up and subsequently be removed with sorbent materials or

by pump into barrels or bags. If the spill is migrating very slowly a dyke may not be necessary and sorbents can be used to soak up fuels before they migrate away from the source of the spill.

### Trenches

Trenches can be dug out to contain spills as long as the top layer of soil is thawed. Shovels, pick axes or a loader can be used depending on the size of trench required. It is recommended that the trench be dug to the bedrock or permafrost, which will then provide containment layer for the spilled fuel. Fuel can then be recovered using a pump or sorbent materials.

## 2) Containment of Spills on Water

Spills on water such as rivers, streams or lakes are the most serious types of spills as they can negatively impact water quality and aquatic life. All measures need to be undertaken to contain spills on open water.

### Booms

Booms are commonly used to recover fuel floating on the surface of lakes or slow moving streams. They are released from the shore of a water body to create a circle around the spill. If the spill is away from the shoreline a boat will need to be used to reach the spill, then the boom can be set out. More than one boom may be used at once. Booms may also be used in streams and should be set out at an angle to the current. Booms are designed to float and have sorbent materials built into them to absorb fuels at the edge of the boom. Fuel contained within the circle of the boom will need to be recovered using sorbent materials or pumps and placed into barrels or bags for disposal.

### Weirs

Weirs can be used to contain spills in streams and to prevent further migration downstream. Plywood or other materials found on site can be placed into and across the width of the stream, such that water can still flow under the weir. Spilled fuel will float on the water surface and be contained at the foot of the weir. It can then be removed using sorbents, booms or pumps and placed into barrels or plastic bags.

### Barriers

In some situations barriers made of netting or fence material can be installed across a stream, and sorbent materials placed at the base to absorb spilled fuel. Sorbents will need to be replaced as soon as they are saturated. Water will be allowed to flow through. This is very similar to the weir option discussed above.

Note that in some cases, it may be appropriate to burn fuel or to let volatile fuels such as gasoline evaporate after containment on the water surface. This should only be undertaken in consultation with, and after approval from the lead agency Inspector.

## 3) Containment of Spills on Ice

Spills on ice are generally the easiest spills to contain due to the predominantly impermeable nature of the ice. For small spills, sorbent materials are used to soak up spilled fuel. Remaining contaminated ice/slush can be scraped and shovelled into a plastic bag or barrel. However, all possible attempts should be made to prevent spills from entering ice covered waters as no easy method exists for containment and recovery of spills if they seep under ice.

### Dykes

Dykes can be used to contain fuel spills on ice. By collecting surrounding snow, compacting it and mounding it to form a dyke down slope of the spill, a barrier is created thus helping to contain the spill. If the quantity of spill is fairly large, a plastic tarp can be placed over the dyke such that the spill pools at the base of the dyke. The collected fuel can then be pumped into barrels or collected with sorbent materials.

### Trenches

For significant spills on ice, trenches can be cut into the ice surrounding and/or down slope of the spill such that fuel is allowed to pool in the trench. It can then be removed via pump into barrels, collected with sorbent materials, or mixed with snow and shovelled into barrels or bags.

### Burning

Burning should only be considered if other approaches are not feasible, and is only to be undertaken with the permission of the lead agency Inspector.

## 4) Containment of Spills on Snow

Snow is a natural sorbent, thus as with spills on soil, spilled fuel can be more easily recovered. Generally, small spills on snow can be easily cleaned up by raking and shovelling the contaminated snow into plastic bags or empty barrels, and storing these at an approved location.

### Dykes

Dykes can be used to contain fuel spills on snow. By compacting snow down slope from the spill, and mounding it to form a dyke, a barrier or berm is created thus helping to contain the spill. If the quantity of spill is fairly large, a plastic tarp can be placed over the dyke such that the spill pools at the base of the dyke. The collected fuel/snow mixture can then be shovelled into barrels or bags, or collected with sorbent materials.

## 5) Worst Case Scenarios

Dealing with spilled fuel which exceeds the freeboard of a dyke or barrier would present a possible worst case scenario for the Mackay Lake Lodge. To contain the overflow, a trench or collection pit would have to be created downstream of the spill to contain the overflow.

Another worst case scenario would be an excessive spill on water may be difficult to contain with the booms present at the site. In this case, an emergency response mobile unit would have to be called in to deal with the spill using appropriate equipment.

#### D. Procedures for transferring, storing, and managing spill related wastes

In most cases, spill cleanups are initiated at the far end of the spill and contained moving toward the centre of the spill. Sorbent socks and pads are generally used for small spill cleanup. A pump with attached fuel transfer hose can suction spills from leaking containers or large accumulations on land or ice, and direct these larger quantities into empty drums. Hand tools such as cans, shovels, and rakes are also very effective for small spills or hard to reach areas. Heavy equipment can be used if deemed necessary, and given space and time constraints. Used sorbent materials are to be placed in plastic bags for future disposal. All materials mentioned in this section are available in the spill kits located at Mackay Lake Lodge. Following clean up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible.

For most of the containment procedures outlined in Section C, spilled petroleum products and materials used for containment will be placed into empty waste oil containers and sealed for proper disposal at an approved disposal facility. The General Manager will consult with the Inspector to determine if other disposal options could be considered on a case-by-case basis.

#### E. Procedures for restoring affected areas

Once a spill of reportable size has been contained, Mackay Lake Lodge will consult with the lead agency Inspector assigned to the file to determine the level of cleanup required. The Inspector may require a site specific study to ensure appropriate clean up levels are met. Criteria that may be considered include natural biodegradation.

## **4) Resource Inventory**

### **i) On-site resources**

Spill kits are located at the boat house and the workshop. The contents are described below. Communications equipment is detailed. In addition, earth moving and other motorized equipment located at Mackay Lake Lodge is also listed below.

#### **Contents of Spill Kits**

##### **The spill kits are standard ones supplied by exploration companies**

- 4 tyvek splash suits
- 4 pairs of chemical master gloves
- 10 large bags with ties for temporary use
- 2 oil only booms (5" x 10')

- 50 oil only mats (16" x 20")
- 5 sorbent socks
- 10 sorbent pads
- 2 large tarps
- 1 roll duct tape
- 1 utility knife
- 1 field notebook and pencil
- 1 rake
- 1 pick axe
- 3 aluminium scoop shovels
- 1 instruction binder

### Communications equipment

Communication equipment includes hand held, marine frequency radios that are carried by the guides and camp staff, base radios are located in the public areas like the dining room and lounge as well as staff and manager offices and cabins. Satellite phones and aircraft radios are located in the office and lounge.

**Table 3: List of motorized equipment on-site and storage location**

Earth moving and other equipment	Storage location
2 loaders	Garage near the runway apron when not in use
2 ATVs with trailers	Usually at the work stations, including the docks, runway and lounge
2 trucks	Garage near the runway apron when not in use
1 cargo van	Kitchen and garage
One snow machine is stored at the garage and others are brought up and returned as needed on the winter road	Used only in winter are parked near the kitchen or cabin occupied by the driver
1 road grader	Near garage
10 fishing boats	On the beach
1 pontoon boat	On the beach

## ii) Off-site resources

Most of the contacts listed below could reach the site in 2 hours at a minimum. However, realistically government officials would not be able to reach the site until the next business day, depending on the severity of the spill.

Mackay Lake Lodge, 24 hr phone line

Phone: (867) 446 1074 when lodge is not open

Phone: (780) 628 13 16 when the lodge is open

NWT 24-Hour spill line

(867) 920-8130

Lands Inspector

(867) 765-6648

Environment Canada - Environmental Enforcement 24 Hour Duty Officer

(780) 499-2432

GNWT Environmental Protection Division

(867) 873-7654

GNWT Environmental Health Office

(867) 669-8979

RCMP (Yellowknife)

(867) 669-1111

Medivac (Yellowknife)

(867) 669-4115

Great Slave Helicopters (Yellowknife)

(867) 873-2081

Air Tindi (Yellowknife)

(867) 669-8218 or 669-8200

As planning for an emergency situation is imperative due to the materials stored on-site and the remoteness of the site, an employee training program has been prepared. It is outlined below.

## **5) Training program**

### **i) Outline of training program**

The primary goal of the Management at Mackay Lake Lodge will be to avoid having any spills, as we have done in the past. Training and orientation for staff and clients will be an important part of achieving this goal.

We have a number of qualified and experienced staff who have been doing a good job over a number of years. Training of lodge staff has included operation of equipment including; boats, ATVs, tractors, trucks & communication equipment, Skills and knowledge in first aid, fire arm safety, and a site orientation. Avoiding spills and then dealing with a contingency plan will be emphasised as part of our staff training and recruitment policy.

Spill contingency will now be part of our regular client orientation meetings that we have on the day of their arrival.

The General Manager is responsible for briefing all staff and clients as to the location of fuel storage, the spill contingency plan, the use of the catch containers when doing fuel transfers, the need to immediately report and take steps to contain a spill should one occur, the location and use of spill kits and reporting requirements, if a spill does occur.

If the lodge is rented or leased to a corporate group or mining exploration company, we will enter into a formal agreement with them to become knowledgeable about our contingency plan and to implement it along with their own land use permits and contingency plan if they have one for another area.