

**APPENDIX III.9**  
**SPILL CONTINGENCY PLAN**

## **PREAMBLE**

This spill contingency plan is preliminary in nature and applies to all operational activities at Snap Lake, including employees' and contractors' activities. Where facilities are not yet constructed, the contingency will be based on anticipated construction details.

A revised and comprehensive plan will follow this plan upon completion of the detailed engineering of the site. The revised and comprehensive plan will be developed in accordance with the environmental management system to be submitted for the purpose of obtaining International Organization for Standardization (ISO) 14001 certification. It will be updated as changes occur, to ensure that it remains useful and meets all applicable federal and territorial regulations. The plan will be followed by a user-oriented document with updated contractor lists, site plans, contact details, and training specifications.

## **CONTINGENCY PLAN MANAGER**

Any correspondence related to this plan should be forwarded to De Beers Canada Mining Inc., #300, 5102 - 50th Avenue, Yellowknife Northwest Territories (NWT), X1A 3S8. Tel: (867) 766-7303, fax: (867) 766-7347, attention: Robin Johnstone, Senior Environmental Manager, Snap Lake.

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## **1.0 INTRODUCTION**

### **1.1 Terms of Reference**

This section consists of the spill contingency plan (Appendix III.9) of the environmental assessment (EA) of the De Beers Canada Mining Inc. (De Beers) Snap Lake Diamond Project.

The spill contingency plan provides the information required by the Snap Lake Diamond Project EA Terms of Reference issued by the Mackenzie Valley Environmental Impact Review Board (MVEIRB).

De Beers is committed to the concept of sustainable development, which requires balancing good stewardship in the protection of human health and the natural environment with the need for economic growth. Diligence in the application of technically proven and economically feasible environmental protection measures will be exercised throughout exploration, construction, operations, and decommissioning activities, to meet the requirements of legislation and to ensure the adoption of best management practices.

### **1.2 De Beers' Environmental Policy**

De Beers' policy is to do the following:

- conduct all activities in compliance with applicable legislation, and other requirements, providing for the protection of the environment, employees and the public;
- apply appropriate good management practices in the absence of legislation or where De Beers believes more stringent criteria than those required by law are needed to advance environmental protection and to minimise environmental risks;
- integrate the management of environmental, social, cultural and economic issues into company business and planning;
- protect the environment through the wise use of resources and prevention of adverse environmental impacts;
- implement, maintain and improve appropriate management systems and programmes to achieve environmental objectives, and to continually improve environmental performance through a process of regular review;
- ensure awareness among employees and contractors of this environmental policy, promote shared responsibility and accountability for environmental obligations, and provide the support and training necessary to achieve these objectives; and,
- communicate openly with governments, employees, local communities, and the public to sustain mutual understanding of environmental, social and economic issues.

### **1.3 Purpose of the Spill Contingency Plan**

In accordance with De Beers' environmental policy, the purpose of this spill contingency plan is as follows:

- to comply with De Beers' environmental policy;
- to identify the organization, responsibilities, and reporting procedures of the Snap Lake emergency response team in the event of an emergency or spill;
- to provide readily accessible emergency information to the cleanup crews, management, and government agencies in the event of a spill;
- to comply with federal and territorial regulations and guidelines pertaining to the preparation of contingency plans and notification requirements;
- to promote the safe and effective recovery of spilled materials;
- to minimize the environmental impacts of spills to water or land; and,
- to provide site information on facilities and contingencies in place, should a spill or malfunction occur.

This spill contingency plan has been prepared in accordance with the following documents:

- Northwest Territories Water Board. 1987. *Guidelines for Contingency Planning*; and,
- Northwest Territories Resources Wildlife and Economic Development Environmental Protection Service. 1988. *Spill Contingency Planning and Reporting Regulations*.

### **1.4 Component Description and Organization**

Section one is the introduction to this document. Section 2 of this spill contingency plan defines a spill and volumes of specific spill materials, which require reporting to the Government of Northwest Territories (GNWT) spill response line. Section 3 provides the initial action plan. Section 4 provides the response organization and Section 5 provides action plans for specific materials on-site. Section 6 provides a description of the facilities found at the site, preventative measures taken to avoid incidents at these facilities, and response action should an emergency incident occur. Section 7 provides information on response equipment and the location of the equipment. Section 8 provides background to the training provided to the response team on-site and Section 9 lists acronyms used in this report. Section 10 provides a list of support documents used in preparation of this plan.

## **2.0 SPILLS**

### **2.1 What is a Spill?**

For the purposes of this plan, a spill will be defined as an accidental release of product into the environment with the potential for adverse impact. The emergency/spill response team must be notified immediately of any spill or emergency.

### **2.2 Materials and Reportable Spills On-site**

According to the *Consolidation of Spill Contingency Planning and Reporting Regulations, Environmental Protection Act 1990*, where there is a reasonable likelihood of a spill in an amount equal to or greater than the amounts set out in the following Table III.9-1, the spill must be reported to the GNWT 24-hour spill report line at (867) 920-8130.

**Table III.9-1**  
**Spill Volumes That Must be Reported to the Government of the Northwest Territories Spill**  
**Report Line**

<b>Transportation of Dangerous Goods Class</b>	<b>Description of Contaminant</b>	<b>Amount Spilled</b>
<b>1</b>	explosives	any amount
<b>2.1</b>	compressed gas (flammable)	any amount of gas from containers with a capacity greater than 100 L
<b>2.2</b>	compressed gas (non-corrosive, non flammable)	any amount of gas from containers with a capacity greater than 100 L
<b>2.3</b>	compressed gas (toxic)	any amount
<b>2.4</b>	compressed gas (corrosive)	any amount
<b>3.1, 3.2, 3.3</b>	flammable liquid	100 L
<b>4.1</b>	flammable solid	25 kg
<b>4.2</b>	spontaneously combustible solids	25 kg
<b>4.3</b>	water reactant solids	25 kg
<b>5.1</b>	oxidizing substances	50 L or 50 kg
<b>5.2</b>	organic peroxides	1 L or 1kg
<b>6.1</b>	poisonous substances	5 L or 5 kg
<b>6.2</b>	infectious substances	any amount
<b>7</b>	radioactive substances	any amount
<b>8</b>	corrosive substances	5 L or 5 kg
<b>9.1 (in part)</b>	miscellaneous product or substances, excluding PCB mixtures	50 L or 50 kg
<b>9.2</b>	environmentally hazardous	1 L or 1 kg
<b>9.3</b>	dangerous wastes	5 L or 5 kg
<b>9.1 (in part)</b>	PCB mixtures of 5 or more parts per million	0.5 L or 0.5 kg
<b>None</b>	other contaminants	100 L or 100 kg

Note: L = litre; kg = kilogram; PCB = polychlorinated biphenyls.



### **3.0 INITIAL ACTION**

Initial actions for spills as defined in Section 2.0 include ensuring safety, identifying and containing spill materials, reporting the spills to the on-site coordinator, alerting De Beers' personnel and spill response team, notifying government agencies and recording the incident. These initial actions are described further in Figure III.9-1, which has been structured in accordance with De Beer's environmental policy. Additional information regarding roles and responsibilities of each party is provided in Section 4.0.

#### **3.1 Ensuring Safety**

Ensuring safety is the responsibility of all parties, particularly the first responder who has the most knowledge of the spill. In the event of a spill, the following tasks are recommended to ensure site and personnel safety:

- be alert - ensure safety of yourself and others;
- assess the hazard to persons in the vicinity of the spill by assessing the dangers of exposure to the spill material;
- shut off ignition sources – NO SMOKING;
- attend to the injured;
- call for assistance;
- do not contain gasoline/aviation fuel if vapours might ignite;
- allow gasoline or aviation fuel spills to evaporate; and,
- keep people away from the spill site.

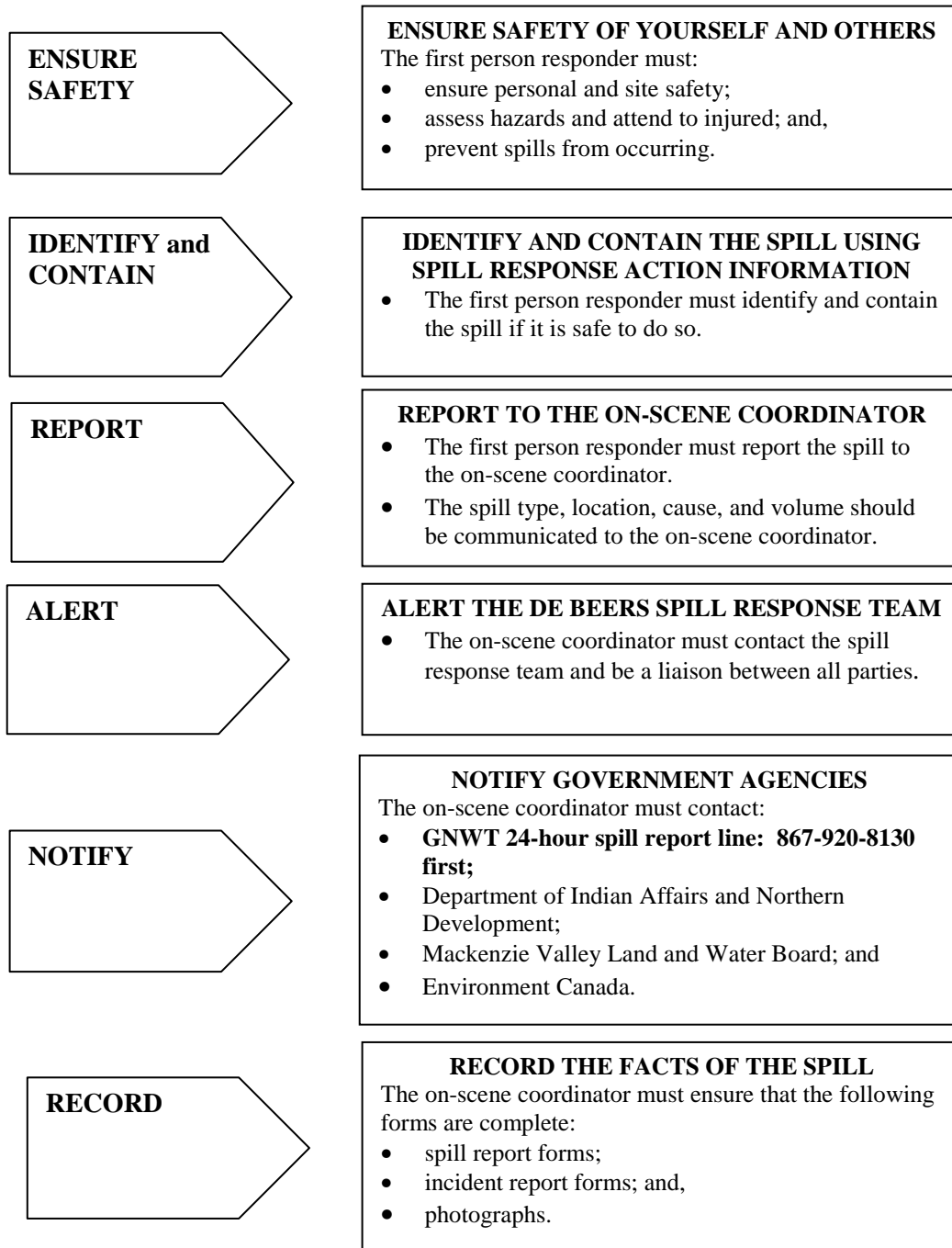
The primary form of ensuring safety is by using preventative measures. All personnel who deal with chemicals must have training in first aid and safe materials handling. In addition, regular training updates and site-specific exercises/drills are key in the prevention of incidents.

#### **3.2 Identifying and Containing the Spill**

Identifying the spill material is essential in both ensuring safety and containing the spill. The material properties must be known in order to (a) assess first aid measures to injured personnel and potential dangers, and (b) assess the appropriate containment measure for the spill material. In the event of a spill, the following tasks are recommended to properly contain the spilled material:

- assess the severity of the spill;
- assess if the spill, leak, or system failure can be readily stopped or brought under control;
- stop product flow if possible;

**Figure III.9-1  
De Beer's Initial Action Plan**



- contain and recover spill as soon as possible;
- wear impervious clothing, goggles, and gloves when containing the spill; and,
- approach spill from up-wind IF IT IS SAFE TO DO SO.

### **3.3 Reporting the Spill**

The first person responder must report the spill to the on-scene coordinator. As a minimum, the spill type, location, cause, and volume should be communicated to the on-scene coordinator.

### **3.4 Alerting Personnel**

The on-scene coordinator must contact the spill response team, delegate tasks, and be a liaison between all parties.

### **3.5 Notifying Government Agencies**

The on-scene coordinator must contact all applicable government agencies. The first agency to be contacted is the GNWT 24-hour spill report line at (867) 920-8130. Other agencies may require reports:

- Department of Indian Affairs & Northern Development;
- Mackenzie Valley Land and Water Board; and,
- Environment Canada.

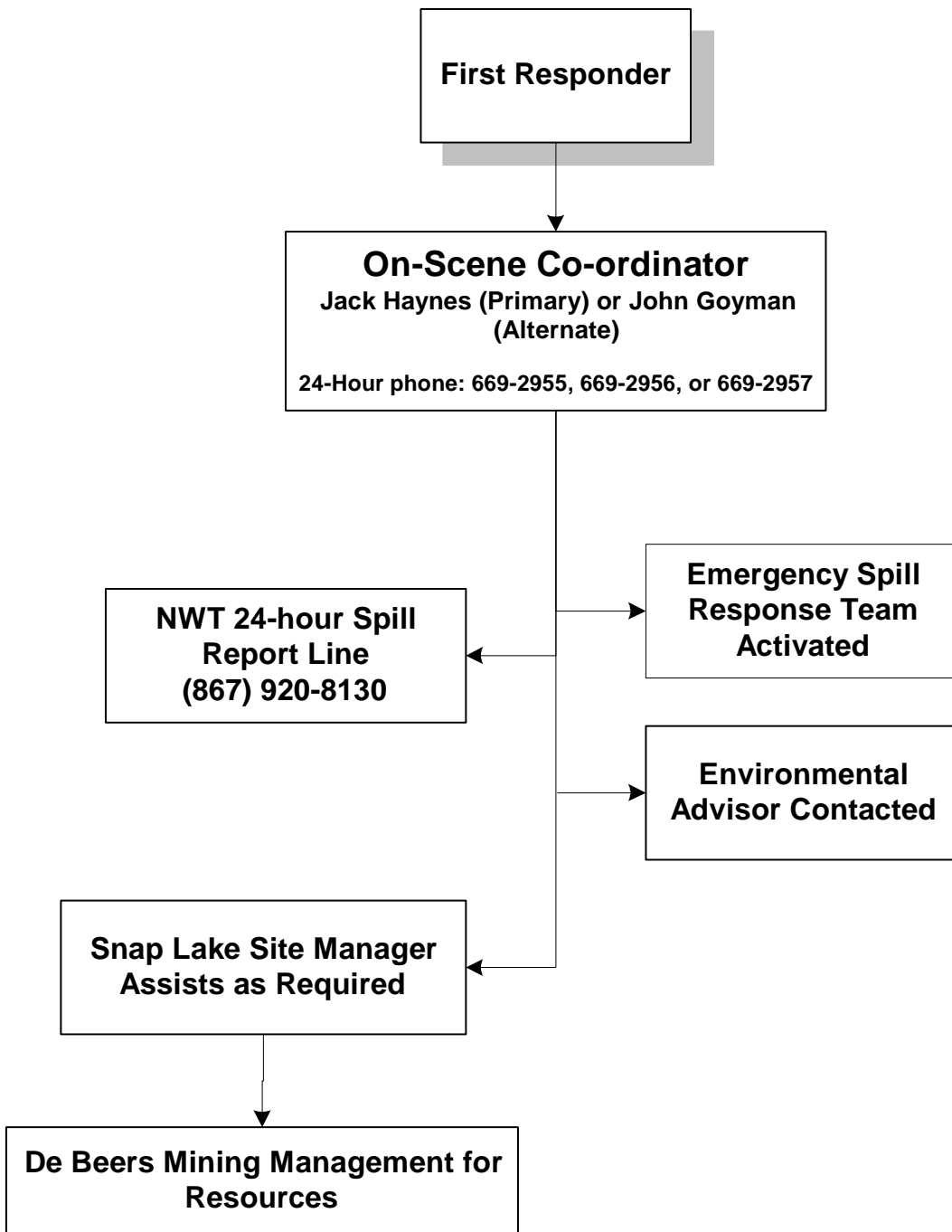
### **3.6 Recording the Facts**

Once the incident has occurred, the on-scene coordinator must ensure that the following forms are complete:

- spill report forms; and,
- incident report forms.

The forms must be supported with photographs, accounts by observers, accounts from injured parties, and comments made by the on-scene coordinator. The spill reporting procedure is provided in Figure III.9-2.

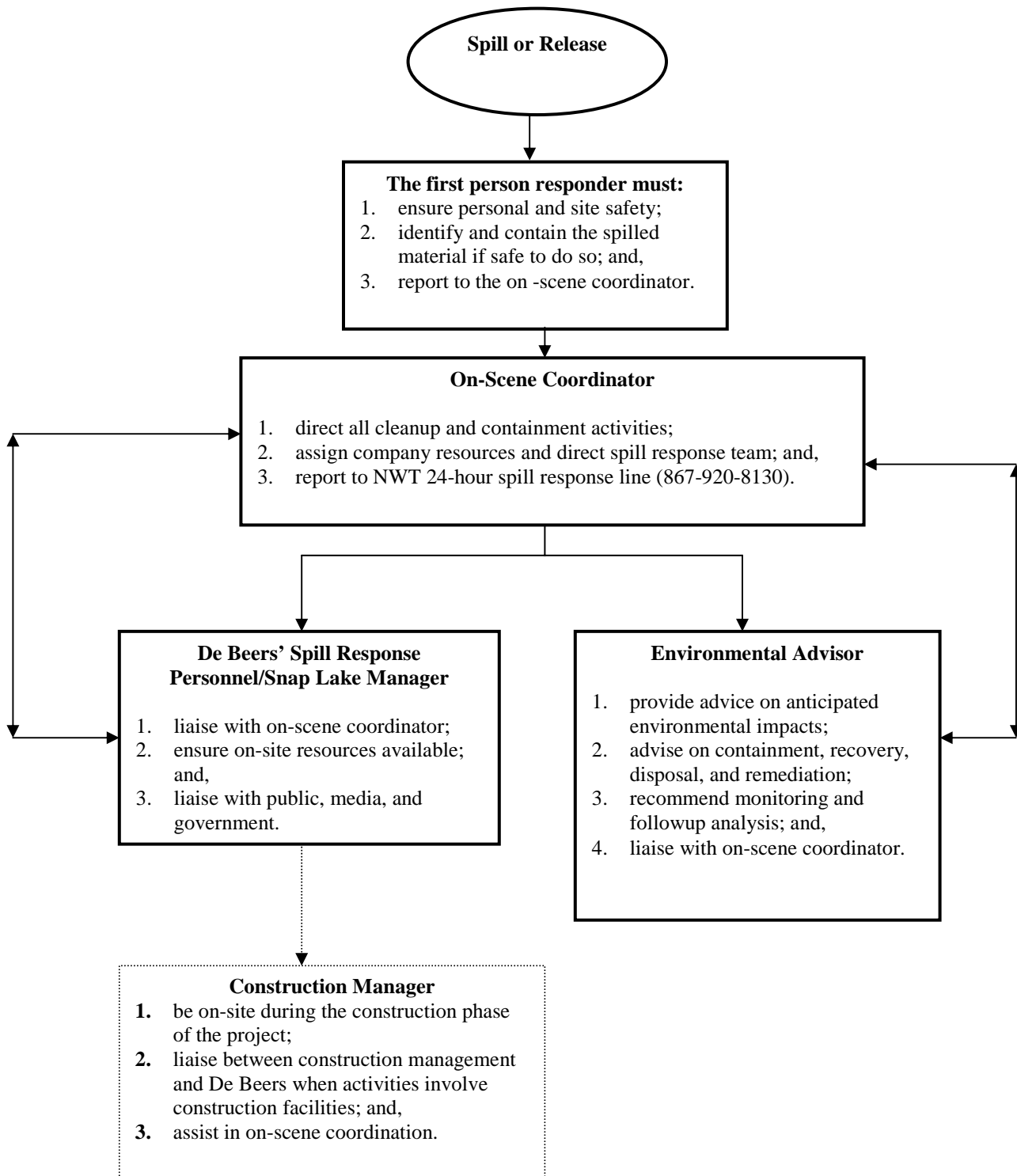
**Figure III.9-2**  
**Spill Reporting Procedure**



## **4.0 RESPONSE ORGANIZATION**

In accordance with the initial action plan described in Section 3.0, the response organization details the roles and responsibilities of each party involved in the spill. In the event that it is not safe to attempt a cleanup effort internally, the environmental advisor and the GNWT spill report line shall be contacted to co-ordinate cleanup using external resources. Figure III.9-3 identifies each member responding to the incident and provides the sequence of the response.

**Figure III.9-3**  
**Response Organization and Reporting Procedures**



#### **4.1 First Responders**

The person who has caused a spill or is the first to observe the spill is the first person responder. The roles and responsibilities of the first person responder are as follows:

- ensuring site and personnel safety;
- assessing the preliminary severity and source of the spill;
- identifying and containing the spill, if it is safe to do so;
- immediately reporting to and working with on-scene coordinator; and
- participating in spill response as a member of the cleanup crew.

#### **4.2 On-Scene Coordinator**

The on-scene coordinator must be knowledgeable of site operations, initial response actions, and spill response equipment and facilities. The on-scene coordinator is responsible for the following:

- assuming complete authority over the cleanup personnel and the spill scene;
- evaluating the initial situation and assessing the magnitude of the problem;
- reporting the spill to the GNWT 24-hour spill report line at (867) 920-8130;
- alerting key personnel in the response team, as deemed appropriate, to handle the situation;
- developing the overall plan of action for containment and cleanup of the specific incident as well as directing and implementing the plan;
- ensuring assigned responsibilities are carried out and co-ordination exists between team members;
- assessing the requirements for people, equipment, materials, and tools to contain the spill in light of what resources are immediately available. The urgency will depend on the nature of the spill;
- following up with regulatory and licensing reporting requirements;
- acting as a spokesperson with the public, media, and government agencies with the aid of the environmental advisor;
- ensuring that the spill response team is provided with proper personal protective equipment (PPE); and,
- ensuring that all spill response personnel receive adequate training to fulfil their responsibilities as part of the spill response team.

#### **4.3 Spill Response Personnel and Snap Lake Site Manager**

The spill response team consists of the first person responder and specifically trained staff who are on-site and ready to aid in the cleanup of a spill. One designated member of the team will provide the following:

- liaising with on-scene coordinator and keeping him/her informed of cleanup activities;
- assisting in obtaining any additional resources not available on-site for spill response and cleanup;
- ensuring that appropriate PPE is worn properly; and,
- conducting cleanup of spills under the direction of the on-scene coordinator.

#### **4.4 Environmental Advisor**

In terms of spills, the environmental manager is contracted to De Beers for the following:

- providing technical advice on what the anticipated environmental impacts of the spill will likely be;
- advising on the effectiveness of various containment, recoveries, and disposal options, and suggesting the most appropriate approach;
- developing sampling programs for collection and analysis of samples to identify and monitor possible contaminant levels; and,
- monitoring the effectiveness of the cleanup operation and recommending further work, if necessary.

#### **4.5 Project Construction Manager**

The project construction manager is potentially required to inform team members of the detailed nature of the operations in the event of a facility malfunction causing a spill during the construction phase of the project. The responsibilities of the project construction manager are as follows:

- providing liaison with De Beers, keeping them informed of cleanup activities; and,
- assisting the on-scene coordinator and spill team as needed, particularly in obtaining any additional resources not available on-site for spill response and cleanup.

#### **4.6 Spill Response Team List and Contact Information**

The members of the emergency spill response team, their duties, location, and phone numbers are listed in Table III.9-2 below.



**Table III.9-2  
Spill Response Team and Contact Information**

<b>Position</b>	<b>Name/Location</b>	<b>24-Hour Contact #</b>
GNWT Department of Resources, Wildlife and Economic Development (RWED)	24-hour spill report line	Ph: (867) 920-8130
On-Scene Coordinator	Jack Haynes (site)	Ph: 867-669-2955 ext. 4 Fax: 867-669-2962 Radio channel #2
On-Scene Coordinator (Alternate)	John Goyman (site)	Ph: 867-669-2955 ext. 2 Fax: 867-669-2962 Radio channel #2 Globalstar: 403-997-5112
Assistant Site Manager	Jack Haynes	Ph: 867-669-2955 ext. 4 Fax: 867-669-2962 Radio channel #2
Snap Lake Site Manager	John Goyman (Site)	Ph: 867-669-2955 ext. 2 Fax: 867-669-2962 Radio channel #2
Environmental Advisor	David Pritchard	Ph: 403-299-4618 Cell: 403-803-6658 24 Hr Pager: 403-218-5223
Personnel	Spill response personnel available on-site to assist with spill and emergency response activities.	To be announced
Project Construction Manager	To be announced	Ph: 867-669-2955 ex 1 Fax: 867-669-2962 Radio channel #2
De Beers Canada Mining Inc. Vice President, NWT Projects	John McConnell (Vancouver)  (Yellowknife)	Ph: 604-605-7182 Fax: 604-605-7183 Ph: 867-766-7303
Snap Lake Senior Environmental Manager	Robin Johnstone	Ph: 867-766-7322
Snap Lake Environmental Coordinator	Kevin Le Drew	Ph: 867-766-7323

Note: ext. = extension.

## 5.0 ACTION PLANS FOR SPECIFIC MATERIALS ON-SITE

This preliminary plan is designed to introduce the basic requirements for the efficient and safe cleanup of the following materials (Table III.9-3) that may be spilled during the operation of the Snap Lake Diamond Project. A more detailed plan will be developed, which will include chemical-specific response requirements, prior to commencement of mine operations.

**Table III.9-3**  
**Consumable Chemical Materials On-site**

<b>Consumables (significant quantities required on an annual basis)</b>	<b>Consumables (relatively small quantities required)</b>
diesel, hydraulic, lube and waste oil ( <i>i.e.</i> , oils and greases) gasoline and Jet B aviation fuel ethylene glycol ammonium nitrate ammonium nitrate fuel oil (ANFO) explosive hydrated lime percol flocculent acetylene ferrosilicon ferric sulphate biological wastes from the sewage treatment plant ( <i>i.e.</i> , sewage, sludge and raw sewage) dynamite and packaged emulsion explosives emulsifiers (N7, N16, and N23) for bulk emulsion explosives sodium nitrate glass beads for bulk emulsion explosives bulk emulsion boosters perimeter explosives incinerator ash paints solvents chemicals in batteries cement lime food products	hydrofluoric acid nitric acid camp maintenance products (detergents, cleaning fluids and powders, light bulbs <i>etc.</i> ) office supplies laboratory chemicals shop supplies (batteries, hardware, fasteners, solvents, machining lubricants, <i>etc.</i> ) surface and underground drilling consumables (drill bits, <i>etc.</i> )

The following subsections are presented in accordance with the material classifications provided in Table III.9-1 of Section 2.0. Some material classes are not applicable to the site or may contain materials that are not found in significant quantities; therefore, they are not presented below.

## **5.1 Explosives**

Explosives on-site are in the form of ANFO, bulk and packaged emulsions, and compressed gases that may ignite (*e.g.*, acetylene). Compressed gases are detailed in Section 5.2. Initial actions regarding explosives include the removal of personnel from the immediate area and the elimination of ignition sources if possible to ensure site and personnel safety. Personnel shall not attempt to contain or remove spills. Personnel handling explosive material shall be fully trained on a regular basis. The environmental advisor and on-scene coordinator shall contact and co-ordinate the appropriate measures for explosive cleanup.

## **5.2 Compressed Gases**

Compressed gases such as acetylene and propane are not expected in large quantities. Vapours can not be contained when released; however, it is important that personnel withdraw immediately from the release. If tanks are damaged, the gas shall be allowed to disperse and no attempted recovery made.

## **5.3 Flammable Liquids**

The most common material being stored and handled on the site are flammable liquids such as diesel, hydraulic, lubricants and waste oil, gasoline, and Jet B aviation fuel. Therefore, additional action plans and details are provided in this section of the report.

### **5.3.1 Action Plan for Fuel Spills on Land**

Fuel spills on gravel, rock, soil, and vegetation shall be contained by the following tasks:

- Soil berms shall be placed down slope of the running or seeping fuel. Plastic tarps shall be placed over the berm and at the foot of it to allow the fuel to pool on the plastic for easy capture. Absorbents shall be used to absorb the fuel collected on the tarp. These pads shall be squeezed into empty drums and re-used. Larger pools shall be pumped back into drums, empty storage tanks, or a “TIDY” tank. It is especially important to prevent the fuel from entering a body of water where it will have greater environmental impact.
- Spills on rock shall be soaked up with particulate absorbent or absorbent sheeting. The used absorbent must be placed in drums for disposal.
- Contaminated soil and vegetation may have to be removed. Contact the government authority identified by the GNWT 24-hour spill report line (867-920-8130) for approval before pursuing this undertaking.

### **5.3.2 Action Plan for Fuel Spills on Snow**

- Snow will work well as a natural absorbent and will collect and contain spilled fuel.
- Snow shall be compacted into snow-berms, which shall be further enhanced by lining with plastic sheeting.
- The snow-fuel mixture shall be scraped up and stored in a lined area or in drums for future disposal.

### **5.3.3 Action Plan for Fuel Spills on Water**

Immediately limit the area of the spill on water by the following tasks:

- Use absorbent pads and similar materials to capture small spills on water.
- Deploy and draw absorbent booms slowly in to encircle spilled fuel and absorb it. These materials are hydrophobic (absorb hydrocarbons and repel water). Absorbent booms are often relied on to recover hydrocarbons that escape containment booms.
- Larger spills on water may have to be recovered with floating skimmers and pumps.

It should be noted that the effectiveness of this action plan is limited by winds, waves, and other factors.

### **5.3.4 Action Plan for Fuel Spills on Ice**

- Where a spill occurs on ice, snow must be compacted around the edge of the spill to serve as a berm (and if time permits, line the berm with plastic sheeting). The ice will reduce the rate of seepage of fuel into the water, but the contaminated snow and ice must be immediately scraped up. Permission may be given from the government to burn off pools of fuel (contact the GNWT 24-hour spill report line). The remaining contaminated snow shall be placed in sealed drums or in a lined berm (on land).

Fuel that escapes under the ice through breaks or cracks is extremely difficult to collect. Expertise must be sought immediately from the environmental advisor.

## **5.4 Oxidizing Substances**

Where a spill of an oxidizing substance such as ammonium nitrate occurs, safety measures would include avoiding inhalation (*e.g.*, by using a dust mask or half faced respirator), ingestion, and eye contact. Spills on land shall be contained by dyking or

barrier. Ammonium nitrate in particular mixes with water and, therefore, spills in water shall be dammed or diverted.

### **5.5 Poisonous and Infectious Substances**

Poisonous and infectious substances such as biological wastes from the sewage treatment plant, laboratory chemicals, and solvents are potentially hazardous when inhaled, ingested, and in contact with the eye. Initial actions include appropriate personal protective equipment (impermeable gloves, eye protection, and respirators appropriate for the size and type of spill). In the event of a spill on land, the material shall be contained by dyking or barrier. Liquids spilled in water shall be dammed and diverted. Where raw sewage is spilled the spill material can be placed back into the sewage treatment plant to be reprocessed.

### **5.6 Corrosive Substances**

The most corrosive substances on the site are hydrofluoric and nitric acids. Personnel dealing with these substances will be limited to selectively trained staff. Personnel shall be trained regularly in prevention, storage, and handling. They will be drilled regularly with spill exercises. In the event of a spill, safety measures shall be implemented immediately. Personnel shall be removed from the area of the spill until appropriate spill containment is acquired and protective gear is donned. Prior to handling corrosive materials, personnel must review safety, storage, and handling measures. The spill material shall be neutralized with lime and/or soda ash prior to containment.

## **6.0 SITE INFORMATION AND PREVENTATIVE MEASURES**

Table III.9-4 summarises the operations, potential for spills and preventative measures for each of the Snap Lake facilities. The areas identified in Table III.9-4 are shown in the overall site plan and the facilities site plan (Figures 3.1-3 and 3.1-4 in the Project Description).

**Table III.9-4**  
**Site Information: Chemicals Stored and Preventative Measures**

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Water Management Pond</i></p> <p>Volume releases from breaches of dams (1 and 2) (e.g., overtopping during spring freshette; crest settlement).</p>	<p>250,000 cubic metres (m<sup>3</sup>) of ponded water and mine inflow water held by Dam 1 (containing processed kimberlite from the advanced exploration program)</p>	<p><u><b>Monitoring</b></u></p> <ul style="list-style-type: none"> <li>• Routine monthly and yearly visual and survey monitoring of the dams, daily/weekly/monthly monitoring of the inflow from the site, site weather conditions, and water level will be conducted.</li> <li>• Weekly inspections of the upstream face, crest, and downstream face of the dams will be carried out to identify water level relative to the crest, erosional features, displaced or eroded rip rap, sinkholes, and visible seepage.</li> <li>• Standpipe piezometers and thermistors are installed adjacent to and within both dams. During ice-free conditions, the piezometers are read at least monthly. Thermistors are read biweekly year round.</li> <li>• Monitoring of the water management pond level is done with the staff gauge installed at the southwest corner of the water management pond and augmented with periodic surveys of ice elevation during the winter months.</li> <li>• An annual geotechnical inspection is undertaken by the design engineers during ice-free conditions and consists of the following tasks: <ul style="list-style-type: none"> <li>• walking visual inspection of the crest and upstream side, followed by an inspection of the toe area;</li> <li>• review of instrumentation data collected to monitor the performance of the dams;</li> <li>• review of processed kimberlite tonnage and water volumes disposed within the facility; and</li> <li>• preparation of a report outlining physical conditions and recommendations for maintenance and additional monitoring.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The water management pond will receive water from the catchment area, and water treatment plant during upset conditions. The dams consist of a rock fill embankment supporting an 80 mil (1 mil = <math>2.5 \times 10^{-3}</math> centimetres) textured high-density polyethylene liner on the upstream side. The liner is keyed into the underlying intact bedrock (using a mixture of sand and powdered bentonite) compacted into a key trench to minimize the seepage beneath the dams. Suitable granular bedding and cover layers were placed on either side of the liners. Small seepage losses are expected to occur.</li> </ul>

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Water Management Pond</i> (continued)</p>		<ul style="list-style-type: none"> <li>Daily records of all measurable inflows to the water management pond are maintained by site personnel to provide a basis for periodic reviews of the water balance and projections of water storage and water management pond level. If routine or annual inspections identify unusual behaviour of, or significant damage to, the dam structures, appropriate remedial measures will be developed in consultation with the design engineer. Such measures could include repair of erosion, re-levelling subsidence of the dam crest, and placement of seepage barriers.</li> </ul> <p><b><u>Contingencies</u></b></p> <ul style="list-style-type: none"> <li>Dam construction materials will be stockpiled for ready use in repair.</li> <li>Adequate supplies of geocomposite liners (e.g., bentomat) for emergency repairs, and bentonite in bags to seal minor leaks will be available on-site.</li> <li>Earthmoving equipment will be available to move fill materials to increase crest elevation, to gain freeboard, or provide a toe berm.</li> <li>Water may be discharged to Snap Lake, providing approval received from the Mackenzie Valley Land and Water Board and water quality meets discharge requirements.</li> <li>Raising of the dams could be considered as a medium- to long-term action should early indications of capacity problems in the water management pond be encountered. It is considered a medium- to long-term action because of the time required to quarry/crush/haul construction materials and mobilize construction equipment.</li> <li>The facility will be operated within its design limits, but should an unexpected or extreme event happen, one or more of the following actions can be taken to reduce the water level: <ul style="list-style-type: none"> <li>➤ Evaluate the water quality and initiate treatment of water management pond water to ensure its acceptability for release.</li> </ul> </li> </ul>	



Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Water Management Pond</i> (continued)</p>		<ul style="list-style-type: none"> <li>➤ Draw down the water management pond via a pipeline to slake in a controlled fashion.</li> <li>➤ Control any release via a channel to minimize dam erosion.</li> <li>➤ During freezing conditions, spray water onto land within the water management pond basin to form ice stockpiles.</li> <li>➤ Cease operation and flood the underground workings.</li> <li>• If excessive seepage is detected by piezometers or visual inspection, water quality analysis of the seepage waters will be completed. If the water quality is within the water licence criteria, it may be allowed to discharge into Snap Lake. The seepage would be monitored for quality and if possible, quantity. If seepage is determined to be above the water licence criteria, water will be collected where possible and returned to the water management pond.</li> <li>• If obvious signs of impending catastrophic failure are detected, human access to the dams and downstream area will be prohibited. Immediate advice would be sought from the design engineer. Permission for emergency discharge may be requested, and/or stabilizing actions such as placement of rockfill or other granular materials on the dam may be carried out. Every attempt would be made to repair, contain, and collect water and processed kimberlite, and return it to the water management pond. Rehabilitation of catastrophic failure would include immediate steps to minimize release of processed kimberlite, followed by measures to contain and recover released processed kimberlite to the water management pond and north pile. These measures and remedial designs would be specified by a geotechnical engineer, environmental specialist, and the Mackenzie Valley Land and Water Board.</li> </ul>	

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<i>Water Management Pond</i> (continued)		<ul style="list-style-type: none"> <li>Key site personnel will be receiving training regarding the monitoring of the dam stability and responding to failures.</li> </ul>	
<i>Process Plant</i>	<ul style="list-style-type: none"> <li>Approximately 1,250 L of 70% hydrofluoric acid will be used on-site annually.</li> <li>Approximately 1,250 L of nitric acid will be used on-site annually.</li> </ul>	<ul style="list-style-type: none"> <li>Advanced emergency response procedures and preparedness training will be followed for storage and handling of hydrofluoric acid.</li> <li>The handling of hydrofluoric acid will be limited to a small group of specially trained personnel.</li> <li>A bermed area for storage will be constructed. The area will be dual-contained and lined with acid resistant material. It will be fitted with both fume hoods and leak detection.</li> <li>Operational policies and practises (<i>i.e.</i>, neutralizing agents to be readily available, fume hoods for appropriate ventilation). Bulk acid requires significant infrastructure for handling, which includes safety showers, fully enclosed acid proof suits, and self-contained breathing apparatus.</li> <li>Bulk acid will be transported in double-walled, high-density polyethylene containers (tote bins), which are fitted with gravity discharge valve, and anti-vacuum filling ports.</li> </ul>	<ul style="list-style-type: none"> <li>As long as the container remains sealed, hydrofluoric acid has an infinite shelf life and can be stored for long time periods</li> <li>Spills and spent acid are best neutralised with lime. Neutralising with caustic results in a soluble form of fluoride which can enter the water treatment system.</li> <li>Windsocks will be placed near the hydrofluoric acid (HF) storage and use areas to determine direction of fluorine gas cloud movement should a spill occur.</li> <li>Fluorine gas detectors and alarms will be installed in the buildings to warn of fluorine gas releases to the environment.</li> </ul>
<i>Airstrip</i>  Potential soil and groundwater impact may result from spills, leaks, and runoff from storage and handling of containers (ethylene glycol/de-icing material).  Crash of aircraft transporting fuel to the site may result in a loss of fuel.  Localized soil and groundwater contamination may result from a spill in the storage area or a fuel spill from the aircraft.	<ul style="list-style-type: none"> <li>10,000 L of Jet B fuel in an Enviro Tank will be located at the airstrip.</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>A reputable carrier will be used.</li> <li>Present landfill on-site can be enlarged to store any contamination from fuel spill.</li> <li>Approach pattern flight paths will not cross the mine site.</li> </ul>	<ul style="list-style-type: none"> <li>The existing airstrip support building is constructed with steel clad walls and concrete floors. There are currently three spill kits present in the building.</li> <li>Access is available for an on-site incident but potentially limited for an off-site incident.</li> <li>Approximately 400 flights/year are expected. The site landing strip is 2 kilometres (km) from mining facilities.</li> </ul>

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
	<ul style="list-style-type: none"> <li>Ethylene glycol will be stored in drums in the service complex shops and power plant. All storage areas have concrete floors with curbs for local containment.</li> </ul>	<ul style="list-style-type: none"> <li>Entries to waterways are to be blocked.</li> <li>Spills will be dyked and contained with vacuum pumps.</li> <li>Waste is to be contained separately and materials stored in marked containers with secondary containment.</li> <li>As a minimum: de-icing operations will be centralized, and glycol will be recaptured, filtered, and/or recycled for other uses.</li> <li>In accordance with the <i>Guidance Manual for Preventing Site Contamination at Federal Facilities</i> (Porter Dillon Limited 1997), a de-icing facility will include: <ul style="list-style-type: none"> <li>grading, berming, and ditching as required to prevent stormwater or snowmelt run-on to the de-icing area while collecting runoff from the site;</li> <li>a linear, fenced retention pond to discourage wildlife access;</li> <li>sloped concrete pavement to facilitate de-icing fluid collection; and,</li> </ul> </li> <li>a dead-end sump and oil water separator.</li> </ul>	<ul style="list-style-type: none"> <li>De-icing activities will adhere to the following legislation: <ul style="list-style-type: none"> <li><i>Canadian Environmental Protection Act</i>;</li> <li><i>Canadian Water Quality Guidelines</i>, Canadian Council of Ministers of the Environment; and,</li> <li><i>Hazardous Products Act</i> and Controlled Products Regulations.</li> </ul> </li> </ul>
<p><i>Bulk Emulsion Plant</i></p> <p>Potential soil and groundwater impact may result from spills, leaks, and runoff from material storage and handling and ruptures in piping.</p> <p>Chemicals stored and handled are explosive agents. Potential for explosion is present in or around the bulk emulsion plant.</p> <p>Localized soil and groundwater contamination may occur.</p> <p>Snap Lake may be contaminated due to the close proximity of the bulk emulsion plant.</p>	<p>Case 1: Storage in 205 L Drums</p> <ul style="list-style-type: none"> <li>diesel fuel</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>Containers should be sealed or closed at all times, unless in use.</li> <li>Any spill of greater than 100 L of diesel shall be reported to the GNWT 24-hour spill report line (867)-920-8130.</li> </ul>	<ul style="list-style-type: none"> <li>Specific type of storage containment is to be determined. The contingency for each type of containment has been provided.</li> <li>It is important to note that ammonium nitrate alone is not an explosive substance. However, when mixed with diesel fuel, the combination is explosive.</li> </ul>

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<i>Bulk Emulsion Plant</i> (continued)	Case 2: Storage in Tanks <ul style="list-style-type: none"> <li>diesel fuel</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) specific to larger catastrophic spill.</li> <li>Any spill of greater than 100 L of diesel shall be reported to the GNWT 24-hour spill report line (867)-920-8130.</li> <li>Regular inspections of the tanks, piping, and valving must be conducted.</li> </ul>	
	<ul style="list-style-type: none"> <li>ammonium nitrate</li> <li>emulsion</li> <li>mixing agents</li> </ul>	<ul style="list-style-type: none"> <li>Any spill of any amount of explosives shall be reported to the GNWT 24-hour spill report line (867)-920-8130 as required by the <i>Environmental Protection Act</i>.</li> <li>A supply of empty containers for storage of spilled ammonium nitrate will be available for recovery and reuse.</li> </ul>	
<p><i>Ammonium Nitrate (AN) storage</i></p> <p>Potential soil and groundwater impact may result from spills, leaks, and runoff from material storage and handling.</p> <p>Localized soil and groundwater contamination may occur.</p> <p>Snap Lake may be contaminated due to the close proximity of the AN storage.</p>	<ul style="list-style-type: none"> <li>1,200 tonnes (t) AN</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Any spill of any amount of explosives shall be reported to the GNWT 24-hour spill report line (867)-920-8130 as required by the <i>Environmental Protection Act</i>.</li> <li>A supply of empty containers for storage of spilled ammonium nitrate will be available for recovery and reuse.</li> </ul>	

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>General Storage Areas:</i> Spills may occur at the portable crusher, stockpile area, cement storage, crushers, lay-down areas, service complex, crushed ore reclaim building, aggregate crushing, kimberlite ore stockpile area, existing pilot plant facilities, core shack, construction camp, and parking areas.</p> <p>Potential soil and groundwater impact may result from spills, leaks, and runoff from storage containers.</p>	<ul style="list-style-type: none"> <li>• An inventory of chemicals stored in each area will be updated upon construction of the facility. Currently, the types of chemicals stored in these areas are as follows: <ul style="list-style-type: none"> <li>• solvents;</li> <li>• lubrication oils;</li> <li>• cement;</li> <li>• diesel; and,</li> <li>• cleaners.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>• Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>• Appropriate secondary containment (<i>i.e.</i>, berms, dykes, containment sumps, impermeable liners, and covers) will be provided.</li> <li>• The following procedures will reduce the risks of spills and equipment failure: <ul style="list-style-type: none"> <li>• proper inspection and maintenance of facilities;</li> <li>• transfer hoses with double locking mechanisms;</li> <li>• careful manual measurement of fuel content in tanks when transferring fuel; and,</li> <li>• training in fuel handling operations.</li> </ul> </li> </ul>	

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Fuel Tanks and Power Plant</i></p> <p>Potential soil and groundwater impact may result from spills, leaks, and runoff from storage containers.</p> <p>Ruptures and leaks may occur in pipes and valves in power plant and tank farm.</p> <p>Localized and widespread soil and groundwater contamination may occur due to the large volumes of fuel and chemicals in the tank farm and power plant.</p> <p>Fuel spills could occur from leaks in storage, transfer between fuel storage and vehicles, transfer between tanks, broken pipes or hoses in transfer facilities and pumping stations, vehicle or equipment accidents or roll-overs, helicopter fuel slinging or operator error.</p>	<ul style="list-style-type: none"> <li>diesel fuel</li> <li>glycol (205-L drums)</li> <li>miscellaneous lubricating oils and greases (various drums, pails, cans, and tubes)</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available. Additional lake booms and skimmers will be in place to collect any spillage from a major fuel release. A water vessel will be available in order to deploy spill containment materials in the lake.</li> <li>The following procedures will reduce the risks of spills and equipment failure: proper maintenance of facilities, transfer hoses with double locking mechanisms, careful manual measurement of fuel content in tanks when transferring fuel, training in fuel handling operations, spill response training, immediate cleanup of all spills, and maintaining additional fuel storage for emergencies.</li> <li>The containment area will hold 110% of the volume of the largest storage tank. It will include a gravel berm with a continuous 60-mil. high-density, polyethylene liner sheet installed under the tanks and the internal sides of the berm. The dyked area will be graded to a sump with a manual drain connection extending outside the dyke.</li> <li>The fuel truck unloading facility will include a concrete pad and spill containment sump. Fuel will be distributed by means of doubled-walled pipes on surface. Approximately 9,000 L of gasoline will be stored within the tank farm area.</li> </ul>	<ul style="list-style-type: none"> <li>Three 12.5-million L, single-walled, welded steel tanks, combined with the existing 3.3-million L storage facility, will provide storage for the fuel requirement for full-scale production.</li> <li>Vehicles and equipment will obtain fuel either at pump stations, from trucks equipped with “TIDY” tanks, or from fuel service trucks. Fuelling will be done in controlled areas.</li> <li>Fuel will arrive by tanker truck via the winter road. Remaining fuel and lubricants will be delivered in 205-L steel drums.</li> <li>A dyked secondary containment area will be provided to contain potential fuel spills. The design of the containment area is based on the requirements of the Canadian Council of Ministers for the Environment (1994) <i>Environmental Code of Practice for Above Ground Storage Tank Systems Containing Petroleum Products</i>, and the National Fire Code of Canada.</li> </ul>

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Incinerator/Sewage Treatment Plant/Auxiliary Boiler/ Potable Water Treatment</i></p> <p>System failures may occur due to pipe blockage, electrical power outage, equipment malfunctions, or foreign objects or material in the influent that cannot be processed by the sequencing batch reactor. Spills may occur due to pipe rupture or control system failure and overflow. Degradation of effluent quality may result from equipment malfunction, or operational error.</p> <p>Potentially out of compliance for water license discharge criteria for the site.</p> <p>Spills resulting during material handling of fuels and other hazardous materials.</p>	<ul style="list-style-type: none"> <li>biological wastes</li> <li>treatment chemicals</li> <li>grey water</li> </ul>	<ul style="list-style-type: none"> <li>Regular inspections will be conducted over entire systems, particularly where joints, elbows, and valves are located.</li> <li>Technical assistance from the manufacturer is available, by agreement, on a 24-hour, 7 day a week basis.</li> <li>Technical assistance and equipment from the manufacturer can be mobilized to site on 24-hour notice should repair, replacement, or adjustments be necessary.</li> <li>Spare parts for certain system components are available on-site in case of equipment failure.</li> <li>Spills of untreated waste will be contained using a vacuum truck and necessary spill cleanup materials (<i>i.e.</i>, spill kit materials) and re-routed to the start of the system.</li> <li>If unfavourable trends appear in a monthly sampling result, on-site measurements for dissolved oxygen, total suspended solids, chlorine, temperature and turbidity will take place and additional samples for laboratory analysis will be collected until effluent quality is satisfactory. Adjustment to the system will be made in consultation with the manufacturer's technical expert.</li> <li>Awareness of detrimental environmental impacts of discharging wastes into stormwater systems will be increased.</li> <li>Storm drain inlets will be labelled to indicate they are not to receive wastes.</li> </ul>	<ul style="list-style-type: none"> <li>Upon completion of commissioning of the sewage treatment plant, the sewage from the existing construction camp will be re-routed for treatment and the existing plant at the construction camp site will be decommissioned. The total sewage effluent discharge is anticipated to amount to 200 m<sup>3</sup>/day. The sewage sludge from the treatment plant will be incinerated, or disposed in the landfill created within the north pile.</li> <li>The sewage system consists of an sequencing batch reactor, coupled with filtration/disinfection equipment. The sequencing batch reactor is a fill and draw activated sludge treatment process that incorporates biological and sedimentation processes in the same tank. The sequencing batch reactor is followed by a sand filter system to control the final total suspended solids level. Ultraviolet radiation equipment disinfects the effluent before discharge to the environment. The sludge is stabilized, dewatered, and incinerated.</li> </ul>
	<p>Case 1: Storage in 205 L Drums</p> <ul style="list-style-type: none"> <li>diesel</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas)</li> <li>Containers should be sealed or closed at all times, unless in use.</li> <li>Any spill of greater than 100 L of diesel shall be reported to the GNWT 24-hour spill report line (867)-920-8130.</li> </ul>	

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<i>Incinerator/Sewage Treatment Plant/Auxiliary Boiler/ Potable Water Treatment (continued)</i>	Case 2: Storage in Tanks <ul style="list-style-type: none"> <li>diesel fuel</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) specific to a larger catastrophic spill will be provided.</li> <li>Any spill of greater than 100 L of diesel shall be reported to the GNWT 24-hour spill report line (867)-920-8130.</li> <li>Regular inspections of the tanks, piping and valving will be conducted.</li> </ul>	
	<ul style="list-style-type: none"> <li>2000 L of chlorine in the form of 12% NaOCl solution (sodium hypochlorite). The solution will be transported in 205-L polyethylene drums and stored in the potable water treatment plant building.</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Regular inspections over entire systems will be conducted.</li> <li>Sodium hypochlorite is corrosive to metals and prolonged contact with metals, particularly at high concentrations, should be avoided.</li> </ul>	
	<ul style="list-style-type: none"> <li>incinerator ash</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of incoming material prior to acceptance. Records of materials will be maintained.</li> <li>Once the ash is brought to the landfill, it will be covered or buried immediately to prevent transport by wind and runoff by rain.</li> <li>Waste products that are not incinerated or landfilled immediately will be sorted and placed within designated areas within the fenced area. These waste products should also be covered to prevent transport by wind and runoff by rain.</li> </ul>	<ul style="list-style-type: none"> <li>An oil-fired incinerator will be located in the plant site area and will be operated daily for the incineration of non-hazardous combustible waste materials. Incinerator ash will be collected regularly in containers and transported to the landfill site for disposal.</li> <li>Depending on the nature of the waste (hazardous, recyclable, <i>etc.</i>) it will be placed in suitable containers and stored for incineration, transport to the land fill site, or long-term storage for backhaul to off-site disposal or recycle facilities.</li> </ul>



Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Waste Transfer Storage Area</i></p> <p>Potential soil and groundwater impact may result from spills, leaks, and runoff from materials stored and handled.</p> <p>Spills may occur during material storage and handling.</p>	<ul style="list-style-type: none"> <li>oils</li> <li>greases</li> <li>batteries</li> <li>ethylene glycol</li> <li>solvents</li> <li>paints</li> <li>chemicals</li> <li>laboratory agents</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided. Only persons authorized to enter and trained in waste handling procedures will have access to the site. The Snap Lake fire and rescue team will be informed of the types of chemicals and chemical inventories that are in the compound at all times.</li> <li>Incoming material will be inspected prior to acceptance. Records of materials will be maintained. Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>Appropriate secondary containment (<i>i.e.</i>, berms, dykes, containment sumps, impermeable liners, and covers) will be provided. The waste transfer area will be fenced and will contain a lay-down area consisting of a compacted fill pad.</li> <li>Where possible, all waste will be stored in its original containers.</li> <li>Containment must be sound, sealed, and undamaged at all times. All containment must be clearly labelled according to the requirements of the workplace hazardous materials information system.</li> <li>Incompatible wastes will be segregated by chemical compatibility to ensure safety of the public, workers, and facility in the event of a spill.</li> <li>Drainage into and from the site will be controlled to prevent spills or leaks from leaving the site and to prevent runoff from entering the site.</li> <li>If hazardous waste is to be transported off-site, the generator, carrier, and receiver must be registered with Environmental Protection Services (EPS).</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies listed are based on the <i>Guideline for the General Management of Hazardous Waste in the NWT</i>, developed by the Environmental Protection Service of the Department of Resources, Wildlife and Economic Development.</li> </ul>

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Landfill/Food Incinerator/Bulk Waste</i></p> <p>Potential exists for hazardous waste to be transported to the landfill.</p> <p>Spills of hazardous materials resulting from hazardous waste may be accidentally transported to the inert waste landfill.</p>	<ul style="list-style-type: none"> <li>inert wastes</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Incoming material will be inspected prior to acceptance. Records of materials will be maintained.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>No hazardous materials will be disposed of in the landfill.</li> <li>Where possible, waste must be minimized, reused, and recycled.</li> <li>Contents of wastes disposed of at the landfill are to be monitored and inspected by landfill operators.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies listed are based on the <i>Guidelines for the Planning, Design, Operation and Maintenance of Solid Waste Modified Landfill Sites in the NWT</i> developed by the Department of Municipal and Community Affairs-Government of the NWT.</li> </ul>
<p><i>Landfarm</i></p> <p>Potential for runoff exists prior to contaminants being aerated and bioremediated.</p> <p>Contaminants exceeding criteria may leach or run off into surrounding areas.</p>	<ul style="list-style-type: none"> <li>Hydrocarbon impacted materials that have the ability to be bioremediated.</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Berms will be constructed as a secondary containment around the landfarm cell area. Drainage on-site will be controlled and monitored.</li> <li>Fencing will be constructed to keep wildlife from accessing the area.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas, additional geotextile available for patching liners) will be available.</li> <li>Stockpiles of hydrocarbon contaminated materials will be covered with an impermeable material (<i>i.e.</i>, tarpaulin or geotextile).</li> <li>Impermeable sheet or geotextile (<i>i.e.</i>, mixing pad) will be placed under stockpiles.</li> <li>Stockpiles will be monitored, maintained, and sampled on a case by case basis until remediation is complete.</li> <li>Samples will be collected and monitored regularly until concentrations of impacted material are below criteria.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies listed are based on the <i>Generic Plans and Operating Procedures of a Remediation Facility for Hydrocarbon Contaminated Materials</i> developed by the Department of Environmental Protection Division, Department of Renewable Resources-Government of the NWT.</li> </ul>

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Water Treatment Plant and Discharge</i></p> <p>Rupture in pipes, valves, or mechanics may occur.</p> <p>A rupture or failure in the plant could result in large volumes of water spilled.</p> <p>Discharges may exceed storm and sanitary regulations for the site.</p> <p>Volume of water stored in water management pond may rise above the maximum water levels allowed in design.</p>	<ul style="list-style-type: none"> <li>flocculents</li> <li>coagulants</li> <li>raw sewage</li> <li>soda ash</li> </ul>	<ul style="list-style-type: none"> <li>Any spilled water will be contained and returned to the water management pond for re-treatment.</li> <li>Maintenance and inspections of mechanical systems are to be conducted.</li> <li>Discharges will be monitored regularly for acceptable water quality.</li> <li>Where the volumes of water discharged to the water management pond are approaching maximum levels, untreated water will be re-routed or contained. Treatment systems are to cease operations.</li> </ul>	<ul style="list-style-type: none"> <li>Water from surface facilities, underground mine and north pile runoff will be routed through the water treatment plant prior to discharge to Snap Lake.</li> </ul>
<p><i>Mine Ventilation Raises</i></p> <p>A fuel spill may occur from the diesel tank, a rupture or failure in the mechanics, or during material handling of diesel fuel.</p>	10 000-L diesel tank	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) specific to larger catastrophic spill will be available.</li> <li>Any spill of greater than 100 L of diesel will be reported to the GNWT 24-hour spill report line at (867)-920-8130.</li> <li>Regular inspections of the tanks, piping, and valving will be conducted.</li> </ul>	<ul style="list-style-type: none"> <li>The existing diesel tank is double walled and in good condition.</li> </ul>
<p><i>Helipad</i></p> <p>Spills may occur during material handling of hazardous materials and fuels stored in the area.</p>	<ul style="list-style-type: none"> <li>aviation gasoline</li> <li>motor oil</li> </ul>	<ul style="list-style-type: none"> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) specific to larger catastrophic spills will be available.</li> <li>Any spill of greater than 100 L of diesel will be reported to the GNWT 24-hour spill report line (867)-920-8130.</li> <li>Regular inspections of the tanks, piping, and valving will be conducted.</li> </ul>	
<p><i>External Seepage and Runoff Collection Ponds</i></p> <p>Potential exists for overflow of collected runoff and processed kimberlite paste from the north pile.</p>	<ul style="list-style-type: none"> <li>leachate from north pile</li> </ul>	<ul style="list-style-type: none"> <li>Leachate will be contained and transferred to collection ponds with available storage capacities.</li> <li>Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> </ul>	

Area – Potential for Spills	Chemicals Stored	Contingency	Notes
<p><i>Container Storage</i></p> <p>Potential soil and groundwater impact will result from spills, leaks, and runoff from material storage and handling.</p>	<ul style="list-style-type: none"> <li>• ferrosilicon (1- to 2-t sealed bags)</li> <li>• flocculent (process plant and water treatment plant reagent)</li> <li>• lime (1- to 2-t sealed bags)</li> </ul>	<ul style="list-style-type: none"> <li>• Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>• A supply of empty containers for storage of spilled dry materials (<i>i.e.</i>, flocculents, ferrosilicon, and lime) will be available for recovery and reuse.</li> </ul>	
	<ul style="list-style-type: none"> <li>• gasoline (205-L drums)</li> </ul>	<ul style="list-style-type: none"> <li>• Emergency response procedures and preparedness training for storage and handling of hazardous materials will be provided.</li> <li>• Operational policies and practises (<i>i.e.</i>, spill kits near storage and handling areas) will be available.</li> <li>• Containers will be sealed or closed at all times, unless in use.</li> <li>• Any spill of greater than 100 L of diesel will be reported to the GNWT 24-hour spill report line at (867)-920-8130.</li> </ul>	

## **7.0 RESPONSE EQUIPMENT**

A checklist of the required items will be present in the spill response kits or equipment storage areas. The spill response supplies will be checked against the equipment lists on a quarterly basis, and any deficiencies will be remedied immediately. The checklists will be reviewed whenever new chemicals are added to on-site activities, to ensure that relevant spill cleanup supplies are present. Material safety data sheets (MSDS) for all the chemicals present in the vicinity of the spill kit will be kept near the kits, and will be updated as necessary to ensure that all chemicals have up-to-date MSDS. The expiry dates of the MSDS will be tracked for every chemical present on-site, to help identify and replace MSDS that are about to expire. MSDS are provided by the chemical suppliers.

### **7.1 General Equipment**

The following general equipment is available on-site to assist in spill response:

- front end loader with bucket and forks;
- various hand held tools including shovels;
- esker sand stockpiled near processing plant; and,
- sand bags and bentonite mats.

Additional equipment will be necessary, as new facilities become available. Future facilities will include the following:

- bulk emulsion plant;
- ammonium nitrate storage;
- acid storage area;
- laydown areas;
- north pile;
- explosives storage;
- landfarm;
- landfill;
- exhaust fan area;
- core shack;
- process kimberlite storage area; and,
- batch plant.

Each facility requires specific spill response equipment. The specific spill kit requirements for each new facility will be provided in the following section.

## **7.2 Spill Kits**

### **7.2.1 Kit Locations**

The locations and types of spill kits to be provided at each facility are listed in Table III.9-5.

**Table III.9-5  
Types of Spill Kits at each Location**

<b>Facility</b>	<b>Location</b>	<b>Kit</b>
Airstrip	apron area	2 x 95-L kits
Crusher	by fuel tank	1 x 95-L kit
Camp emergency genset area	outside east end of genset	1 x 95-L kit
Permanent genset area	day tank area	1 x 425-L kit
Pilot plant	main entrance door	1 x 425-L kit
Procon shop area	genset side of mine dry	1 x 425-L kit
Tank farm	north berm west end	1 x 425-L kit
	west end fuel module	1 x 425-L kit
	east end fuel module	1 x 425-L kit
	west side waste oil area	1 x 95-L kit
	south berm in centre	1 x 425-L kit
Fresh water intake	pumphouse	pumphouse kit
Jet B storage – helicopter refuel	refuel area	1 x 95-L kit
Bulk emulsion plant	diesel storage area and chemical mixing areas	3 x 425-L kits 5 shovels 10 empty 205-L drums
Ammonium nitrate storage		ammonium nitrate storage kit
Plant facility (location to be announced)	acid storage area	acid spill kit
Plant facility (location to be announced)	acid process area	acid spill kit
Laydown areas		3 x 425-L kits 5 shovels 10 empty 205-L drums
North pile	leachate collection points	3 x 425-L kits 5 shovels 10 empty 205-L drums
Explosives storage (8)		1 x 425-L kit per building, and 1 explosives cleanup kit per storage building
Landfarm		1 x 95-L kit additional liner material ( <i>i.e.</i> , tarps, <i>etc.</i> )
Landfill	leachate collection points	3 x 425-L kits 5 shovels 10 empty 205-L drums
Exhaust fan area	diesel storage areas and engine room	2 x 95-L kit at each location
Core shack	chemical storage area	2 x 95-L kits
Batch plant		2 x 95-L kit

## 7.2.2 Kit Contents

The size and contents of the 95 L, 425 L, 23 L, acid, pumphouse and ammonium nitrate storage spill kits are listed in Tables III.9-6 to III.9-11, respectively.

**Table III.9-6  
95-L Spill Kit**

Number of Pieces	Size	Description
25 pieces	17" x 19"	oil selective pads
25 pieces	18" x 18"	universal pads
10 pounds		"Eatum" floor sweep
1 piece	36" x 48"	polyethylene disposable bag
1 pair		chemical resistant gloves
1 pair		Uvex safety goggles
1	95-litre	metal containment drum

(a) " = inch

**Table III.9-7  
425-L Spill Kit**

Number of Pieces	Size	Description of Pieces
10 pieces	3" x 4'	universal socks
4 pieces	5" x 10'	oil selective boom
100 pieces	17" x 19"	oil selective pads
50 pieces	18" x 18"	universal pads
15 pounds		"Eatum" floor sweep
2 pieces	36" x 48"	poly disposable bag
2 pair		chemical resistant gloves
1 pair		Uvex safety goggles
1	425-litre	metal containment drum

(b) ' = foot

**Table III.9-8  
23-L Spill Kit**

Number of Pieces	Size	Description of Pieces
2	3" x 4'	boom socks
10	18" x 18"	absorbent pads
1 pair		rubber gloves
1 kilogram		absorbent
1		garbage bag



**Table III.9-9  
Acid Spill Kit (Polyethylene Container Only)**

<b>Number of Pieces</b>	<b>Size</b>	<b>Description of Pieces</b>
equivalent volume to stored acid (approximately 2,500 L equivalent)		lime
3 sets		fully enclosed acid-proof suits and self-contained breathing apparatus in nearby room (safe distance from fumes)
3		full face respirators with chemical acid cartridges
3 pair		laboratory coats with splash aprons made out of natural rubber, neoprene, or Viton.
20 pair		medium to heavy weight natural rubber, neoprene or Viton gloves.
3	20-litre	polyethylene sealable buckets
2 litres		calcium gluconate gel (must be refrigerated)
20 pair		disposable exam gloves (to apply calcium gluconate gel)

Note: a combination eyewash/shower should be present nearby and should be tested monthly to ensure that it will operate if necessary.

**Table III.9-10  
Pumphouse Spill Kit**

<b>Number of Pieces</b>	<b>Size</b>	<b>Description of Pieces</b>
2		motorized boats for spills from fuel storage into lake
20 pieces	3" x 4'	universal socks
20 pieces	5" x 10'	oil selective booms
100 pieces	17" x 19"	oil selective pads
50 pieces	18" x 18"	universal pads
20 pieces	36" x 48"	polyethylene disposable bag
1 box		chemical resistant gloves
5 pair		Uvex safety goggles
3		425-L metal containment drum

**Table III.9-11**  
**Ammonium Nitrate Storage Spill Kit**

Number of Pieces	Size	Description
2 boxes		chemical resistant gloves
2 pair		Uvex safety goggles
2 pair		Tyvek coveralls
2 pair		½ mask respirators with organic filters and National Institute for Occupational Safety and Health (NIOSH) / and Occupational Safety and Health Association approved dust respirator
3	205-litre	metal containment drums
2		shovels
1 box		plastic garbage bags

### 7.3 Mobile Environmental Response Unit

During the period of time when the ice road is open, PetroCanada's emergency response mobile unit is available on-call for incidents involving petrochemical products such as diesel fuel, gasoline, and Jet-B fuel. The unit is operated by RTL Trucking and can be reached at:

**Yellowknife:** Contact – Mike Suchlandt (869) 873-6271

**Enterprise:** Contact – Bob Wheaton (867) 984-3351

24-hour emergency support is also available from PetroCanada at (403) 296-3000 (collect calls accepted). The site manager is responsible for ensuring that qualified mobile environmental response unit services are provided. These duties would include ensuring that contracts are in place for the provision of these services.

## **8.0 TRAINING AND EMERGENCY/SPILL EXERCISE**

### **8.1 Training**

A designated spill response team consisting of on-site personnel will be established. De Beers will ensure that a trained spill response team will be present on-site at all times. All members of the team will be trained and familiar with emergency and spill response resources, including their location and access, the spill contingency plan, and appropriate emergency spill response methodologies. Spill response team training will be conducted annually to ensure that sufficient team members are present, and to ensure that training is up-to-date. The following training will be included:

- a review of the spill response plan and responsibilities of the team members;
- the nature, status, and location of fuel and chemical storage facilities;
- the on-site and off-site spill response equipment, and how to use it;
- emergency contact lists;
- desktop exercises of “worst case” scenarios; and,
- the likely causes and possible effects of spills.

All instructors will be highly qualified in spill response and prevention methods.

All personnel and contractors at the project site will be familiar with spill reporting requirements. This will be maintained by conducting an orientation and training program for all contractors and new personnel on initial spill response procedures. Attendance will be tracked on-site and re-training will occur annually.

Fuel handling crews are fully trained in the safe operation of the facilities, spill prevention techniques, and initial spill response. Similarly, the staff involved with the process, processed kimberlite, and wastewater systems are trained in the safe operation of these systems. Retraining of these crews will occur annually, and retraining schedules will be tracked on-site.

Training programs will include regular workplace hazardous materials information system (WHMIS) and transportation of dangerous goods (TDG) training for all employees who use or are responsible for chemicals on-site. WHMIS and TDG training will be provided by a qualified trainer. Additional safe chemical handling training will be conducted for employees handling or working in the vicinity of dangerous chemicals such as hydrofluoric acid, nitric acid, explosives, and fuels. Completion dates of this training will be tracked and re-training will occur annually. Retraining for TDG will be

completed every three years. Employee TDG training status will be tracked by on-site personnel so that retraining can occur before expiry of previous TDG training.

Occupational Safety and Health Association (OSHA) training will occur for all new staff handling or responsible for chemical use, and annual refresher courses will be taken. Dates of course attendance will be tracked so that refresher courses can be offered prior to expiry of the previous course. Qualified trainers will provide the OSHA training.

The on-site environmental manager will ensure that records of current training are retained, employee training expiry dates are tracked, and retraining is completed in a timely manner.

## **8.2 Emergency/Spill Exercise**

De Beers will conduct regular emergency/spill exercises to test the response of the spill response team to system failures, emergencies, or spills. A report is made by the on-scene coordinator noting the response time, personnel involved, and any problems or deficiencies encountered. This report is used to evaluate the ability of personnel to respond to spills and to determine areas requiring improvement. The results of this report will be used in subsequent training exercises to continually improve the training program.

## **9.0 REFERENCES**

CCME (Canadian Council for Ministers of the Environment). 1994. Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products. National Task Force on Storage Tanks for the Canadian Council of Ministers of the Environment. August.

Porter Dillon Limited. 1997. Preventing Site Contamination at Federal Facilities: A Guidance Manual. Contaminated Sites Management Working Group. Environment Canada. March.

## **10.0 UNITS AND ACRONYMS**

### **UNITS**

'	foot
"	inch
hr	hour
kg	kilogram
km	kilometre
L	litre
lb	pound
m <sup>3</sup>	cubic metre
m <sup>3</sup> /day	cubic metre per day
mil	equivalent to 2.5 x 10 <sup>-3</sup> centimetres
pcs	pieces
pr	pair
t	tonne

### **ACRONYMS**

AN	ammonium nitrate
ANFO	ammonium nitrate/fuel oil
De Beers	De Beers Canada Mining Inc.
EA	environmental assessment
EPS	Environmental Protection Service
ext.	extension
GNWT	Government of Northwest Territories
HDPE	high density polyethylene
HF	hydrofluoric acid

ISO	International Organization for Standardization
MSDS	material safety data sheet
MVEIRB	Mackenzie Valley Environmental Impact Review Board
NaOCl	sodium hypochlorite
NIOSH	National Institute for Occupational Safety and Health
NWT	Northwest Territories
OSHA	Occupational Safety and Health Association
PCB	polychlorinated biphenyls
PPE	personal protective equipment
RWED	Department of Resources, Wildlife and Economic Development
TDG	transportation of dangerous goods
WHMIS	workplace hazardous materials information system