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Spill Plan
Nanuq North Project

Kivalliq Region, Nunavut
1:250,000 NTS 56G

Peregrine Diamonds Ltd.

15 August-2015

Introduction

This document is an updates Spill Contingency Plan for the Nanuq North Project. It builds upon previous Spill Contingency Plans for the Project and shall be in effect as of August 8, 2015. At present the Nanuq North Project is on hiatus.

The Nanuq North Claim Block is located on 1:50,000 NTS Maps, 56G07, 56G10, and 56G11. The field camp is located on NTS Map 56G06 and the coordinates are as follows:

Latitude: 65º 23' 45.65"
Longitude: -91º 13' 8.40"

This location is approximately 300 kilometres at heading 7.45 degrees (north-northeast) of Rankin Inlet.

All employees, whether permanent or casual, and programme contractors, are required to be trained in spill procedures. All spills, regardless of how small, will be recorded and catalogued. Only spills that meet reportable thresholds will be called into the 24 hour spill response line so as not to burden government officials with minor spills. Peregrine will keep a catalogue of spills for statistical purposes.

Background as of August 18, 2015

The exploration camp (Latitude 65º23'45.65"N Longitude 91º13'8.40"W) authorized in June 2009 has yet to be established. There are no buildings, tent frames or tents at this location.

There are no fuel caches located on the Nanuq North Project Area.

The last drilling on the Nanuq North Project occurred on August 2, 2011. All drill materials were removed upon the completion of drilling.

When facilities are established or additional exploration work undertaken the following Spill Plan will apply

Spill Procedures

A spill is classified as the discharge of petroleum products or other dangerous substances into the environment. Potential hazards created by the spill for humans, vegetation, water resources, fish and wildlife vary in severity, depending on several factors, including nature of the material, quantity spilled, location and season. Refer to the detailed section *Spill Response Actions: By Product* for specific response information.

The general emergency response to be followed in the event of a spill at the Nanuq North Project, Kivalliq, NU, is:

1) ***Protect people*** - prevent personnel from approaching the site and keep them at a distance sufficiently removed that they will not be injured by, or cause, a fire or explosion
2) ***Identify the product and its source*** - check container design, warning labels, markings, Material Safety Data Sheets, etc., to enable prompt and appropriate response
3) ***Stop the flow at the source*** - reduce or terminate the flow of product without endangering anyone
4) ***Assess the seriousness of the spill*** - assess potential dangers of the spill to human health and safety, the aquatic environment, wildlife, ground water, vegetation and other land resources
5) **R*eport the spill*** – complete a NU Spill Report Form and contact the NU 24-hour Spill Report Line. Provide information on the form and to the Environment Canada officer by phone/FAX/e-mail (*cf.* Figures 1 and 2), including location of spill, (company) name of polluter, type and amount of material spilled, date and time of the spill, any perceived threat to human health or the environment, and remedial actions taken and planned.
6) ***Clean up the spill*** - follow procedures appropriate for the location, environment, material and time of year
7) ***Evaluate and learn*** – after the emergency has passed, evaluate the incident and the clean up with the goal of continuous improvement in prevention and response; train or re-train personnel and ensure a practice incident-and-response drill is held at least once per field season.

Table 1: Important Contact Information

Organization	Description	Telephone
Environment Canada	24 Hour Spill Report Line	1-867-920-8130 (Iqaluit)
AANDC	Land & Water Inspector	1-867-975-4517 (Iqaluit)

Permits and Authorizations

The Nanuq North Project consists of 51 mineral claims with an aggregate area of 33,056.75 hectares. All claims are on Crown land.

Two permits authorize exploration activities:

1) *Nunavut Water Board Permit 2BE-NQN-1521*
2) *AANDC Land Use Permit N2012C0026*

Spill Response Team Leaders

The following two positions will be physically present at the Nanuq North site, in respect of management or control of contaminants.

1) **Project Manager**: To be determined at time of field operations
2) **Camp Manager**: To be determined at time of field operation

Peregrine Diamonds Ltd. Land Administrator: David Willis, will be informed of all spills.

Camp Facility

The camp facility consists of a seasonal tent camp accommodating up to 15 persons with above ground fuel storage in 205 litre drums (diesel, Jet B, gasoline) and propane in 45kg cylinders. All fuel will be stored more than 30 meters form the high water mark of the closest water body and fuel will be stored in berms.

Table 2: Projected Fuel Types for 2015 to 2016

Fuels	Containers	Capacity
Diesel for camp stoves, drills + heaters	0 drums	205L
Aviation turbine fuel (Jet-B)	0 drums	205L
Unleaded petrol (gasoline)	0 drums	205L
Propane	0 cylinders	45kg
Oxygen (welding and medical)	0 cylinders	45kg
Acetylene	0 cylinders	45kg
Oils/lubricants/cleaners	0	1L to 5L each

TRAINING AND PRACTICE DRILLS

All personnel on site will be trained in spill response procedures. Training will be conducted at the camp induction and at least one drill will be conducted per season. Initial or refresher training (practice drills), as appropriate, provided once per field season.

Regular inventory updates, provided in list form to all team members. Information to be reported includes listing of all resources, number of items, their location, condition, date of last inspection and any special comments (such as expiry dates, under whose authority they may be accessed and special handling instructions, if any).

Spill Response Kits

Spill response kits and additional bundles of absorbents will be located at: will be located at:

1. All fuel Caches
2. At the drill during drill operations
3. Within the camp

Table 3 on the flowing page includes a catalogue of general spill response gear.

Table 3: General Response Inventory –Nanuq North Property

#	Item	Location
1.	Fire extinguishers (valid/recharged) in each structure:	Tents, drillshack
2.	Water pump and spare; hoses and fittings	Camp Dry and Drillshack
3.	Hammers, assorted weights	Camp Dry and at Drillshack
4.	Assorted 10L-20L plastic pails;	Camp Dry and Drillshack
6.	127L plastic garbage bags (boxes of 20 each)	Kitchen and Latrine
7.	Plastic tarps – assorted sizes	Camp Dry
8.	Liner material (minimum 30mil),	Camp Dry
9.	Extra bundles of absorbents	Camp Dry
10.	Fuel-transfer pump	Camp and Drillshack
11.	Empty drums for contained spilt substances	Camp

Fuel Spills; Risk Assessment and Preventative Measures

The possibility of a fuel spill on Peregrine projects will vary, depending on a number of factors, including human error, mechanical failure, road conditions, weather conditions, etc. Table 4 on the following page details risk assessment and mitigations.

Table 4: Risk Assessment & Preventative Measures

POTENTIAL PROBLEM	IMPACT	PROBABILITY	PREVENTATIVE MEASURES
Diesel or Oil Major leak from drums	High	Low	• Training/refresher training for site personnel who handle fuels. • Daily inspections and monitoring • Placement of drums in a suitable area (e.g.depression), with natural drainage pattern away from water, • Berming with peat bales or snow. • Secure drums in use on proper stands
A spill from a valve left open or a break in a transfer hose.	High	Moderate	• Daily inspections to ensure all valves are either closed (when not needed), or that a catch pail is installed beneath valves, e.g., at tents, drillshacks, or that an enviro-tainer is in use. • Fuel transfer hoses will have a double locking mechanism and undergo daily inspection as part of the routine work cycle, to check for soundness and wear. • Markers around all fuel transfer lines.
Pump Failure	Low	Low	• Pumps are to be inspected weekly and -serviced monthly.
Broken Or Blocked Drill Sludge Lines	Low	Moderate	• Lines are inspected daily as part of the routine work cycle.
Chemical Spills	Low – High	Low	• Training in the handling of chemicals will take place to ensure safe handling. • Chemicals will be stored in their original labelled drums, bottles, canisters or packages. • Chemicals will be stored in such a way as to protect from the weather or spillage, and be in non-reactive trays, underlain with liner material or absorbents to prevent chemicals coming into contact with soil or tent floors. • Regular inspections will take place of stored chemicals. • Inventory controls in place
Gases (oxygen, acetylene, propane, argon, carbon dioxide)	Low-High	Low	• Training/refresher training for site personnel who handle gases. • Stored in designated areas until required, secured upright. • Daily checks of cylinders in use, including gas-detector monitoring, as necessary.

FIGURE 1: Updated NWT-Nunavut Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR	REPORT NUMBER
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS			

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ LA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

PEREGRINE DIAMONDS LTD. SPILL REPORT
SUPPLEMENTAL QUESTIONNAIRE
DATE:

PART I: What events lead up to the incident?

PART II: What Mitigation Measures were taken?

PART III: What are the planned preventative measures to avoid future similar incidents?

PART IV: What is the planned disposal method and chain of custody?
(**Include:** 1)*Who handled it, 2) Where it was stored, 3) How it was shipped and 4) All bills of lading*)

FIGURE 2: Instructions for Completing the NT-NU Spill Report Form

Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and e-mailed as an attachment to spills@gov.nt.ca. Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call to the spill line. Forms can also be printed and faxed to the spill line at 867-873-6924. Spills can still be phoned in by calling collect at 867-920-8130.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. **Please do not fill in the Report Number**: the spill line will assign a number after the spill is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. **You must include the geographic coordinates** (Refer to Section E).
E. Geographic Coordinates	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. **Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.**
G. Contractor involved?	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
H. Product Spilled	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Wherever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B)
I. Spill Source	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overfill, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m^2)
J. Factors Affecting Spill	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or environment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
K. Additional Information	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. **Please number the pages to ensure that recipients can be certain that they received all pertinent documents.** If only the spill report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	**Leave Blank**. This box is for the **Spill Line's use only**.

PRODUCT CATEGORIES

The materials in this Spill Contingency Plan are generally divided into five categories:

- Flammable Immiscible Liquids
- Soluble Solids/Oxidizers
- Flammable Compressed Gases
- Soluble Liquids
- Toxic Solids

Flammable Immiscible Liquids
These substances are all hydrocarbon-based and will ignite under certain conditions. Petrol (gasoline) and aviation fuels pose the greatest fire and safety hazard and are not recoverable when spilled on water.

Action Plan Steps

- Confirm that a spill has occurred. It may not be obvious if a spill has occurred - look for:
- pooled liquid.
- damage to equipment/tanks.
- smell of fuel or chemicals and
- leaks from hatches, valves or other fixtures

Assess the Situation
Before initiating response actions, take the time to determine the nature of a spill and to collect some or all of following facts:

- potential risk of fire, explosion and environmental damage.
- extent of injuries to co-workers or the public.
- source and approximate size of the spill.
- possible methods to stop the flow of product; and
- proximity to water.

Take Action

- Eliminate ignition source(s) if safe to do so.
- Shut off spill source if safe to do so.
- Attend to any injured persons.
- Restrict personnel to the spill site using barriers or marker tape.
- Warn others in the area of the spill.
- Use an explosion meter to monitor atmospheric gas concentrations.
- Report spill to Peregrine management.
- Transport Spill Kit to the spill site.
- Control spreading and minimise impacts.

Spill Containment and Recovery
Special care should be taken to ensure that spilled material does not reach waterbodies where recovery is more difficult. Ice augers (under appropriate conditions) can be effective in terms of locating and exposing oil for burning or pumping off.

Waste Disposal
At the Nanuq camp, all combustibles are incinerated on a daily basis. This includes food scraps, office garbage, etc.

Non-hazardous solid "inert" waste generated (e.g., scrap metal, pipe, wood) or potentially hazardous waste (e.g., plastics, liners, Styrofoam) will be transported off site for disposal according to its nature.

All hazardous wastes and waste items that cannot be incinerated are securely packaged, flown out on aircraft backhauls, and disposed of in designated locations off-site.

Prior to disposal, the hazardous waste will be properly packaged, labelled, and stored and manifested in a Transportation of Dangerous Goods (TDG) approved shipping container. (A waste generator number has been obtained from the Government of Nunavut (GN) Department of Environment. GN Waste Generator Forms will be used).

The container will have the appropriate hazardous waste labels.

All Federal, Provincial and Territorial regulations will be adhered to.

Used Container Disposal
To ensure the proper disposal of used containers that have contacted, collected or contained a hazardous or regulated substance (e.g., paint cans, oil cans, acid containers, aerosol cans).

Containers having contacted, collected or contained an acute hazardous material, corrosive or reactive substance will be triple washed with water prior to disposal. (Contaminated wash-water can report to labelled refuge drums).

Metal containers can be disposed of as scrap metal and flown off-site for disposal. Any free liquid in the container will be disposed of properly, and the residual material allowed to dry or solidify.

Used Drum Disposal
The majority of used fuel drums (205L) for Jet-B fuel and unleaded petrol are returned to the supplier. However, during operations, some drums will be set aside for usage as refuge drums, for storage of other "used" products (i.e., used glycol, used oil, spillt materials, oil filters, etc). These drums will be properly labelled and stored prior to acceptable removal and disposal off-site at an approved facility.

RESPONSE ORGANISATION

On rare occasions, additional company and outside resources may need to be brought in to support the spill cleanup. For a major incident, the Project Manager (*cf. Page 6*) would mobilise Peregrine, contractor and outside expertise for the response.

GENERAL RESPONSIBILITIES

The following provides a general guide to the Spill Response Organisation responsibilities. In some cases, certain Peregrine personnel may fill dual roles, depending upon the circumstances of the incident.

In most incidents, the Site Supervisor, working with the site Spill Response Team, will handle the initial response, containment and cleanup. In larger incidents, Peregrine management will play a more active role. In all cases, Peregrine management will be notified immediately of a spill and will be responsible for notifying the 24-hour Spill Line or assigning this task to a designate.

Other contractors and specialists may be brought in to assist in response to a major incident.

Individual Discovering Incident

- Assess the initial severity of the spill and safety concerns.
- Identify the source of the spil
- Report all spills to Supervisor.
- Determine the size of the spill and stop or contain it, if possible.

Spill Response Team

- Conduct the cleanup of spills under the direction of the Supervisor.
- Deploy booms, absorbent and other equipment and materials as required.
- Take appropriate response measures.
- Continue the cleanup as directed by the Supervisor or until relieved.

Supervisor

- Assist in initial and ongoing response efforts.
- Supervise the Spill Response Team.
- With work crew, take initial action to seal off the source and contain spill.
- Decide with Peregrine management if mobilisation of additional equipment is required.
- Assess whether burning is a viable cleanup measure. Consult regulatory agency (Environment Canada on Spill Line can provide initial guidance).
- Ensure co-ordination of equipment and manpower as needed (Peregrine and contractors)
- Ensure expeditious response and cleanup of spill site and impacted area.

Additional Resources – Support Team to the Spill-Response Team

- Provide assistance to Supervisor as required.
- Responsible for mobilising additional Peregrine support staff, security and other contractors as required.

Peregrine Management

- Records the time of the report, source of information and details on location, size, type of spill and any other information available on the Spill Report Form.
- Ensures that the spill is reported to the NU 24-Hour Spill Report Line.
- Oversees or directs the cleanup operation until it is satisfactorily completed.
- Together with the Supervisor, decides if additional equipment is required to contain and cleanup spills.
- Maintains contact with Supervisor to ensure final inspection and sign-off on the spill.
- Notifies internal company departments.
- Initiates Mutual Aid Agreements if so required.
- Oversees completion and distribution of the Spill Report.
- Ensures investigation identifies measures to prevent similar spills.
- Provides cleanup advice to the Supervisor.
- Assists with preparation of press releases.
- Provides advice on storage and disposal options.
- Ensures that there are followup reports prepared on the spill event, cleanup and environmental impacts.
- Ensures that post-spill reports are completed and takes action, as necessary, to prevent a recurrence.
- Liaises with government agencies (as required)

Response Resources

A wide variety of spill control/recovery equipment and material exists for dealing with spills of petroleum products and chemical reagents (*cf. Pages 6-7*).

Response Equipment Deployment.

All equipment is stored in such a manner as to be readily available on short notice.

The Supervisor would immediately respond to a reported spill site by notifying site personnel to move into place material necessary to provide control and cleanup (e.g., shovels, refuge drums, tarps, liner material [2], etc.). Emergency spill containment and recovery materials and supplies are available on site for immediate mobilisation at any time.

Spill Response Actions By Product

At the Peregrine Nanuq Project, “safety first” is the abiding principle which guides response: Spills and products are to be handled as/if safety permits.

After adequate safety precautions, effort will be concentrated on stopping or eliminating the source of ignition.

Diesel

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES
APPEARANCE: Clear, Yellow or Red FLASH POINT: 40°C (Minimum) ODOUR: Petroleum POUR POINT: -50° to -6°C SOLUBILITY: Insoluble VISCOSITY: Not Viscous VAPOUR DENSITY: Will Sink to Ground Levels SPECIFIC GRAVITY: Floats on Water (0.8 – 0.9)

SAFETY MEASURES	
WARNING	Vapours are heavier than air and form easily at high temperatures. Empty containers can contain explosive vapours. Toxic gases form upon combustion. Eye contact causes irritation. Material can accumulate static charges. Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.
PERSONAL PROTECTION	Always wear impervious, chemica1-resistant clothing, gloves, footwear, and goggles; nitrile and PVC are suitable materials (DO NOT USE NATURAL RUBBER or NEOPRENE.) Wear full-face organic vapour cartridge respirator where oxygen is adequate, otherwise wear positive pressure SCBA.
PRECAUTIONS	Monitor for explosive atmosphere. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone and peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.

RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, and alcohol foam or water fog. Use water to cool containers exposed to fire.

Hydraulic Oil

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES
APPEARANCE: Straw-Yellow Liquid FLASH POINT: 215°C (Minimum) ODOUR: Petroleum POUR POINT: -25°C SOLUBILITY: Generally Insoluble VISCOSITY: Medium (265 x ST, 15°C) VAPOUR DENSITY: Few Vapours Emitted SPECIFIC GRAVITY: Floats on Water (0.9)

SAFETY MEASURES	
WARNING	Vapours are heavier than air but are unlikely to form. Toxic gas can form in fire and at high temperatures. CO, CO_2, and dense smoke are produced upon combustion. Oil mist or vapour from hot oil can cause irritation of the eyes, nose, throat and lungs.
PERSONAL PROTECTION	Always wear impervious, chemical -resistant clothing, gloves, footwear, and goggles; PVC, nitrile, and Viton are suitable materials (DO NOT USE NATURAL RUBBER). Use of organic vapour cartridge respirator is highly unlikely.
PRECAUTIONS	Avoid excessive heat, which can cause formation of vapours. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.

RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol, foam or water fog. NOTE: water or foam may cause frothing. Use water to cool containers exposed to fire.

Lubricating Oil

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: Amber Liquid FLASH POINT: 190° to 2220°C ODOUR: Petroleum POUR POINT: -35° to -40°C SOLUBILITY: Generally Insoluble VISCOSITY: Medium (255 xST, 15°C) VAPOUR DENSITY: Few Vapours Emitted SPECIFIC GRAVITY: Floats on Water (0.9)	
SAFETY MEASURES	
WARNING	Vapours are heavier than air but are unlikely to form. Toxic gas can form in fire and at high temperatures. CO, CO_2, and dense smoke are produced upon combustion. Oil mist or vapour from hot oil can cause irritation of the eyes, nose, throat and lungs.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; PVC, Nitrile, and Viton are suitable materials (DO NOT USE NATURAL RUBBER). Use of organic vapour cartridge respirator is highly unlikely.
PRECAUTIONS	Avoid excessive heat, which can cause formation of vapours. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.

RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA and eye protection when responding to lube oil fires. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol foam or water fog. NOTE: water or foam may cause frothing. Use water to cool containers, exposed to fire.
ON LAND	Prevent additional discharge of oil. Do not flush into ditch/drainage systems. Block entry into waterways. Contain spill by diking with earth, snow or other barrier. Remove minor spills with absorbent and/or peat moss. Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.
ON WATER	Use booms to contain and concentrate spill. Remove spill using absorbents or skimmer. Protection booming can be considered for water intakes.
STORAGE & TRANSFER	Store closed, labelled containers in cool, and ventilated areas away from incompatible materials.
DISPOSAL	Segregate waste types. Place contaminated materials into marked containers. Consult with environmental authorities during fina1 disposal.
FIRST AID	
EYES	Flush eyes immediately with fresh, warm water (NOT HOT) water for 20 minutes, while holding the eyelids open. Remove contact lenses, if exposed to vapours or liquid. Get prompt medical attention.
SKIN	Remove and launder contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention. Discard saturated leather articles.
INHALATION	Move victim to fresh air. Perform CPR if victim not breathing. Provide oxygen if victim is having difficulty breathing. Get prompt medical attention.
INGESTION	DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration. Get prompt medical attention.

Waste Oil

ON LAND	Prevent additional discharge of oil. Do not flush into ditch/drainage systems. Block entry into waterways. Contain spill by diking with earth, snow or other barrier. Remove minor spills with absorbent pads and/or peat moss. Remove large spills with pumps or vacuum equipment. Spill can also be mechanically removed if oil is too viscous to be pumped.
ON WATER	Use booms to contain and concentrate spill. Remove spill using absorbents or skimmer. Protection booming can be considered for water intakes.
STORAGE & TRANSFER	Store closed, labelled containers in cool, ventilated areas away from incompatible materials.
DISPOSAL	Segregate waste types. Place contaminated materials into marked containers. Consult with environmental authorities during fina1 disposal.
FIRST AID	
EYES	Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes, while holding the eyelids open. Remove contact lenses, if exposed to vapours or liquid. Get prompt medical attention.
SKIN	Remove and launder contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention. Discard saturated leather articles.
INHALATION	Move victim to fresh air. Perform CPR if victim not breathing. Provide oxygen if victim is having difficulty breathing. Get prompt medical attention.
INGESTION	DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration. Get prompt medical attention.

Petrol (Unleaded Gasoline)

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: Colourless Liquid (Can Be Dyed) FLASH POINT: -50°C ODOUR: Gasoline/Petroleum POUR POINT: -60°C SOLUBILITY: Insoluble VISCOSITY: Not Viscous (<1 cSt) VAPOUR DENSITY: Will Sink to Ground Level SPECIFIC GRAVITY: Floats on Water (0.7 - 0.8)	
SAFETY MEASURES	
WARNING	Vapours form instantaneously, and are heavier than air. Empty containers can contain explosive vapours. Vapours can travel to distant sources of ignition and flash back. Eye contact causes irritation. Material can accumulate static charges. Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; PVC, Nitrile, and Viton and PVC are suitable materials (DO NOT USE NATURAL RUBBER or NEOPRENE). Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA, if circumstances warrant.
PRECAUTIONS	Monitor for explosive atmosphere. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.
RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol foam or water fog. Use water to cool containers, exposed to fire.

ON LAND	ELIMINATE IGNITION SOURCES. Do not flush into ditch/drainage systems. Block entry into waterways. Contain spill by diking with earth, snow or other barrier. Remove minor spills with peat moss and/or absorbent pads. Cover pools with foam to prevent vapour evolution if gasoline presents a fire hazard; otherwise allow vapours to dissipate.
ON WATER	ELIMINATE IGNITION SOURCES. DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS. Protection booming can be considered for water intakes.
STORAGE & TRANSFER	Store closed, labelled container in cool, ventilated areas away from incompatible materials. Electrically ground containers and vehicles during transfer.
DISPOSAL	Place contaminated materials into segregated marked containers. Consult with environmental authorities during final disposal.
FIRST AID	
EYES	Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes, while holding the eyelids open. Remove contact lenses, if exposed to vapours or liquid. Get prompt medical attention.
SKIN	Remove and launder contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention. Discard saturated leather articles.
INHALATION	Move victim to fresh air. Perform CPR if victim not breathing. Provide oxygen if victim is having difficulty breathing. Get prompt medical attention.
INGESTION	DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration. Get prompt medical attention.

Jet-B (JP-4) OR Jet-A Fuel

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: White or Pale Yellow Liquid FLASH POINT: -20°C to -25°C ODOUR: Gasoline/Petroleum POUR POINT: -50°C SOLUBILITY: Negligible VISCOSITY: Not Viscous (<7 cSt) VAPOUR DENSITY: Will Sink to Ground Level SPECIFIC GRAVITY: Floats on Water (0.75 - 0.8)	
SAFETY MEASURES	
WARNING	Vapours instantaneously form, and are heavier than air. Low-lying areas can trap explosive vapours. Vapours can travel to distant sources of ignition and flash back. Eye contact causes irritation. Material can accumulate static charges. Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; PVC, Nitrile, and Viton and PVC are suitable materials (DO NOT USE NATURAL RUBBER or NEOPRENE). Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA, if circumstances warrant.
PRECAUTIONS	Monitor for explosive atmosphere. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.
RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol foam or water fog. Use water to cool containers, exposed to fire.

ON LAND	ELIMINATE IGNITION SOURCES. Do not flush into ditch/drainage systems. Block entry into waterways. Contain spill by diking with earth, snow or other barrier. Remove minor spills with peat moss and/or absorbent pads. Cover pools with foam to prevent vapour evolution if gasoline presents a fire hazard; otherwise allow vapours to dissipate.
ON WATER	ELIMINATE IGNITION SOURCES. DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS. Protection booming can be considered for water intakes.
STORAGE & TRANSFER	Store closed, labelled containers in cool, ventilated areas away from incompatible materials. Electrically ground containers and vehicles during transfer.
DISPOSAL	Place contaminated materials into segregated marked containers. Consult with environmental authorities during final disposal.
FIRST AID	
EYES	Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes, while holding the eyelids open. Remove contact lenses, if exposed to vapours or liquid. Get prompt medical attention.
SKIN	Remove and launder contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention. Discard saturated leather articles.
INHALATION	Move victim to fresh air. Perform CPR if victim not breathing. Provide oxygen if victim is having difficulty breathing. Get prompt medical attention.
INGESTION	DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration. Get prompt medical attention.

Fuel Dye

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: Dark Red Liquid FLASH POINT: -28°C ODOUR: Aromatic Hydrocarbon POUR POINT: -45°C SOLUBILITY: Negligible VISCOSITY: Not Viscous VAPOUR DENSITY: Will Sink to Ground Level SPECIFIC GRAVITY: Floats on Water	
SAFETY MEASURES	
WARNING	Vapours instantaneously form, and are heavier than air. Low-lying areas can trap explosive vapours. Vapours can travel to distant sources of ignition and flash back. Eye contact causes irritation. Material contains xylene, benzene and ethyl benzene. Inhalation of vapours can cause nausea, headache and dizziness.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; PVC, Nitrile, and Viton are suitable materials (DO NOT USE NATURAL RUBBER or NEOPRENE OR PVC). Wear full-face organic vapour cartridge respirator where oxygen is adequate; otherwise wear positive pressure SCBA, if circumstances warrant.
PRECAUTIONS	Avoid breathing vapours or mist. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.
RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, AFFF foam or water fog. Use water to cool containers, exposed to fire.

Propane

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: Colourless Gas FLASH POINT: -104°C ODOUR: Natural Gas Odour POUR POINT: -190°C SOLUBILITY: Insoluble VISCOSITY: N/A VAPOUR DENSITY: Will Sink to Ground Level SPECIFIC GRAVITY: Liquid Floats on Water	
SAFETY MEASURES	
WARNING	Vapours form instantaneously, and are heavier than air. Vapours can travel to distant sources of ignition and flash back. Eye contact causes irritation. Material can accumulate static charges. Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; Nitrile: and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC). Avoid frostbite bum to skin and eyes from contact with propane. Wear full-face organic vapour cartridge respirator where oxygen is adequate, otherwise wear positive pressure SCBA.
PRECAUTIONS	Monitor for explosive atmosphere. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.
RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol foam or water fog. Use water to cool containers, exposed to fire.

ON LAND	ELIMINATE IGNITION SOURCES. DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS.
ON WATER	ELIMINATE IGNITION SOURCES. DO NOT ATTEMPT TO CONTAIN OR REMOVE SPILLS.
STORAGE & TRANSFER	It is not possible to collect released material.
DISPOSAL	Consult with environmental authorities if the disposal of any contaminated materials is required.
FIRST AID	
EYES	Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes, while holding the eyelids open. Remove contact lenses, if exposed to vapours or liquid. Get prompt medical attention.
SKIN	Remove and launder contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention. Discard saturated leather articles.
INHALATION	Move victim to fresh air. Perform CPR if victim not breathing. Provide oxygen if victim is having difficulty breathing. Get prompt medical attention.
INGESTION	DO NOT INDUCE VOMITING; if victim is conscious; give milk or water to drink. If vomiting begins, keep victim's head below hips to prevent aspiration. Get prompt medical attention.

Acetylene

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: Colourless Gas FLASH POINT: -18°C ODOUR: Garlic-Like POUR POINT: -82°C SOLUBILITY: Slightly Soluble VISCOSITY: N/A VAPOUR DENSITY: Will Sink to Ground Level SPECIFIC GRAVITY: Liquid Floats on Water (0.06)	
SAFETY MEASURES	
WARNING	Vapours form instantaneously, and are heavier than air. Empty containers can contain explosive vapours. Vapours can travel to distant sources of ignition and flash back. Eye contact causes irritation. Material can accumulate static charges. Inhalation of vapours can cause irritation of the respiratory tract, headache, vomiting, and unconsciousness.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; use suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC). Wear full-face organic vapour cartridge respirator where oxygen is adequate, otherwise wear positive pressure SCBA.
PRECAUTIONS	Monitor for explosive atmosphere. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.
RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol, foam, or water fog. Use water to cool containers, exposed to fire.

Antifreeze (Ethylene Glycol)

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES	
APPEARANCE: Colourless Liquid FLASH POINT: 111°C ODOUR: Slight; Undetectable <25 ppm POUR POINT: -13°C (48% Solution) SOLUBILITY: Soluble in All Proportions VISCOSITY: Not Viscous (=22 cSt) VAPOUR DENSITY: Will Sinks to Ground Level SPECIFIC GRAVITY: Same as Water (1.0)	
SAFETY MEASURES	
WARNING	Vapours are heavier than air. Ingestion of significant quantities can be lethal. Eye contact causes irritation. Skin contact can cause intoxication due to absorption. Inhalation of vapours can cause intoxication, headache, vomiting, unconsciousness with convu1sions, and even death Avoid inhaling vapours, particularly in enclosed places.
PERSONAL PROTECTION	Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; neoprenes, nitrile, PVC are suitable protective materials.
PRECAUTIONS	Monitor empty containers for explosive atmosphere. Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, peroxides. Eliminate ignition sources. Restrict access and work upwind of spill.
RESPONSE TO FIRES	
CONSIDER ACTION ONLY IF SAFETY PERMITS!	Wear SCBA in confined areas. Shut off fuel supply. Extinguish fire with CO_2, dry chemical, alcohol foam or water fog. (Note: Water or foam may cause frothing). Use water spray to cool containers exposed to fire.

ON LAND	Block entry into waterways. Do not flush into ditch/drainage systems. Contain spill by diking with earth, snow or other barrier. Remove minor spills with universal type absorbent. Remove large spills with pumps or vacuum equipment.
ON WATER	Ethylene glycol sinks and mixes with water; contain spill by isolating contaminated water through damming or diversion.
STORAGE & TRANSFER	Store closed, labelled containers in cool, ventilated areas away from incompatible materials
DISPOSAL	Segregate waste types. Place contaminated materials into marked containers. Consult with environmental authorities during final disposal.
FIRST AID	
EYES	Flush eyes immediately with fresh, warm water (NOT HOT WATER) for 20 minutes, while holding the eyelids open. Remove contact lenses, if exposed to vapours or liquid. Get prompt medical attention.
SKIN	Remove contaminated clothing. Wash skin thoroughly soap and water. Get medical attention.
INHALATION	Move victim to fresh air. Perform CPR if victim not breathing Provide oxygen if victim is having difficulty breathing. Get prompt medical attention.
INGESTION	INDUCE VOMITING IMMEDIATELY if victim is conscious; Get prompt medical attention.

SPILL PLANNING AND LOGISTICS

The feasibility of containing and recovering a spill will be generally determined by its location and the rate of release, spreading, transport and evaporation. These rates should be compared with the total time needed to deploy response equipment in order to evaluate whether or not containment, and/or absorbent and skimming operations, can be effectively implemented. The pre-assembly of spill cleanup kits will expedite response and reduce the total deployment time needed, including:

Equipment and support material mobilisation time.
Personnel mobilisation time, including transit and assembly.
Actual equipment setup and deployment time.

a. Determine whether or not a spill has entered a waterway and whether or not access by land or water to control points is possible so that booms, absorbents and skimmers can be deployed. Check maps and consult with personnel familiar with the spill area.
b. Establish priorities to optimise use of personnel and gear needed for all cleanup phases (containment, removal, storage, transfer and disposal) at selected sites.
c. Allow additional time for adverse weather and flying.

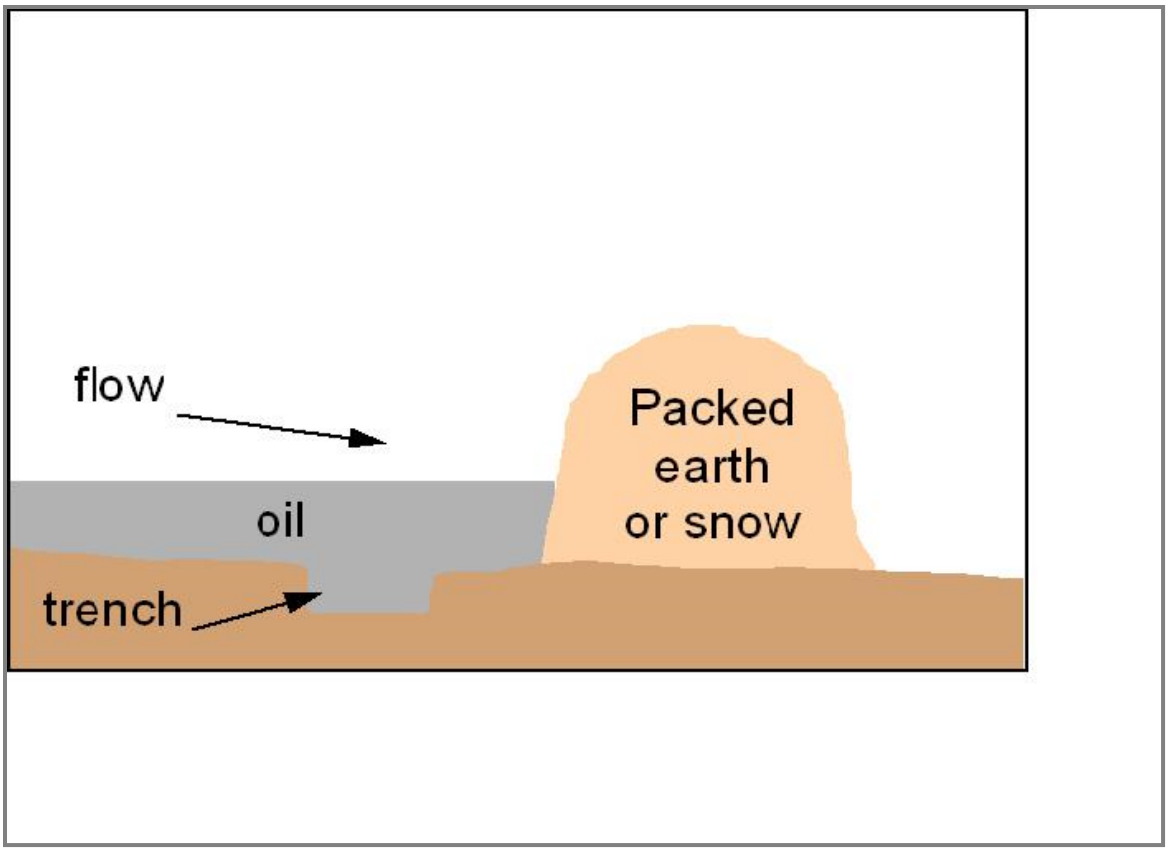
MONITORING SPILLS

Peregrine will monitor spills throughout the response to ensure safety and to direct cleanup efforts:
Explosive gas concentrations in the atmosphere using an explosion meter.
Spill movement and behaviour, in order to properly direct response efforts.
All threats to the safety of people, property and the environment.

SPILLS ON LAND

Spills on land should be contained as close to the source as possible, if safety allows. Peregrine will make every effort to ensure that a spill does not reach water, where its containment and recovery (after breakup) are more difficult and the potential environmental impacts are greater. Containment can be achieved using:

A berm or dyke around the spill source.
A trench or ditch downslope of the spill source.



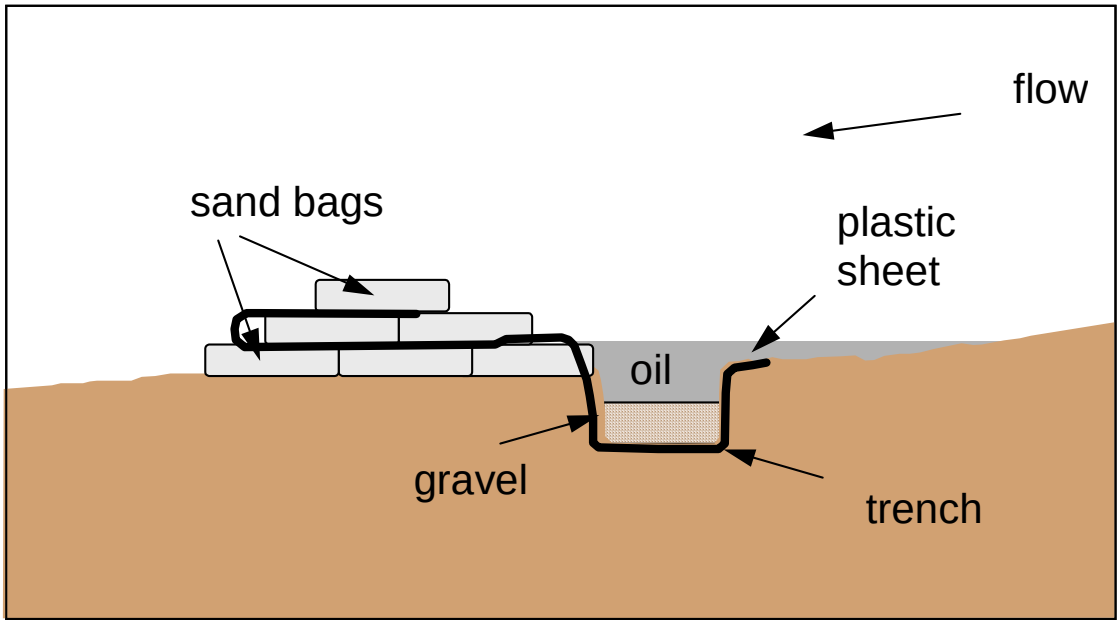
Earthen Berm/Trench

If possible, locate the berm/trench sufficiently downslope of the release point to complete its construction before the spill arrives. Dig the trench along a natural drainage contour.

It should be approximately 0.5 m deep with a relatively flat bottom. The excavated material can then be combined with other available material to build the berm.

Sand Bag Berm/Trench

Sand bags can be used where available and if the earth is too hard or frozen and cannot be excavated or compacted. A plastic liner can be used to seal the trench and bags should be anchored with gravel or rocks and be woven between layers of bags.



Spills on Muskeg

Muskeg is generally poorly drained, wet and spongy. Internal drainage is usually slow and the depth of peat over mineral soil varies greatly. Muskeg is also highly acidic and low in nutrients, making biodegradation very slow, even during the summer months.

It is recommended that small oil spills in muskeg be mixed with peat moss and allowed to degrade during the summer months, since more damage can be done by attempting cleanup using mechanical removal methods.

In the event of a small spill, it is important to weigh the advantages or cleanup versus the potential negative impacts on the terrain. Both personnel and equipment on wet or sensitive areas can cause considerable damage. In many cases, the best solution may be to add nutrients to the contaminated area and monitor the site to ensure that the spill does not migrate to an adjacent sensitive area. In all cases, appropriate environmental advisors and regulatory authorities should be consulted.

SPILLS ON WATER

Containing spills in water is often difficult because oil quickly spreads. In turbulent water, oil and chemicals are likely to mix into the water column, making recovery impractical. For these reasons, it is important that if the spill reaches water, that containment be attempted as close to the source as possible, and that the spill be prevented from reaching a flowing stream.

Spills in lakes should be contained, if possible, before reaching outlets where containment and recovery can be difficult and dangerous.

Efforts to contain spills in large streams should be limited to land-based operations where the oil might pool in accessible back eddies. The recovery of water-soluble chemicals is not possible.

In flowing streams, oil travels at the same speed as the surface current. On larger rivers or in open lake areas, slicks are also transported at 3.5% of the wind speed. Although a comparatively small effect, it can be an important factor if the wind is at right angles to the water flow and if the water surface is extensive. The wind can force the spill to the sides of the river where flows are slower or the shore of a lake. Long reaches of the river may become contaminated, although containment and recovery might also be possible.

In smaller streams, the wind will have less impact and the slick speed can be easily estimated. Placing a small stick in the middle of the stream and determining the length of time required to travel a given distance, typically 10 m. This information can be quickly converted to speed (36/time (sec) = km/h) to determine the estimated travel time to a confluence or other sensitive area.

Containment Strategies for Spills on Water

Determining the best strategy for containment will depend on a number of factors:

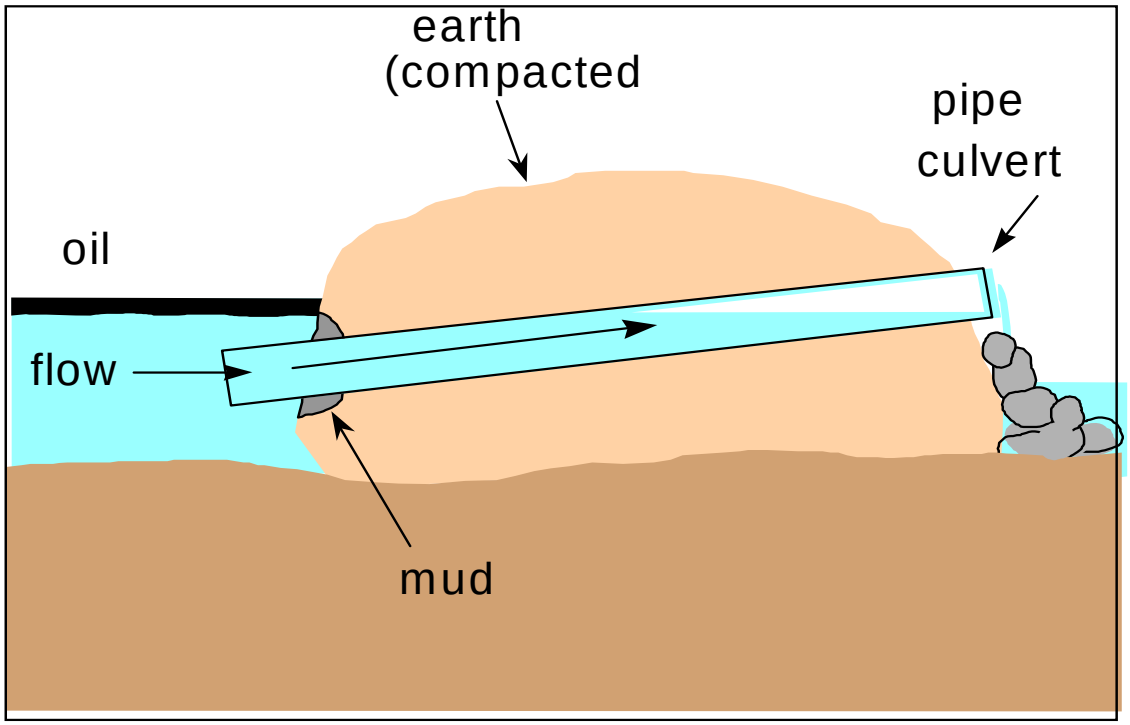
Speed of oil-slick travel
Location of possible containment sites
Availability of personnel and equipment
Location of sensitive areas
Safety of operations

Spills on water can be contained by using floating booms (absorbent or non-absorbent) or by constructing a temporary berm or inverted weir. The objective is to build a barrier against which the (normally floating) oil will pool whilst allowing the underflow of water.

Inverted Weir:

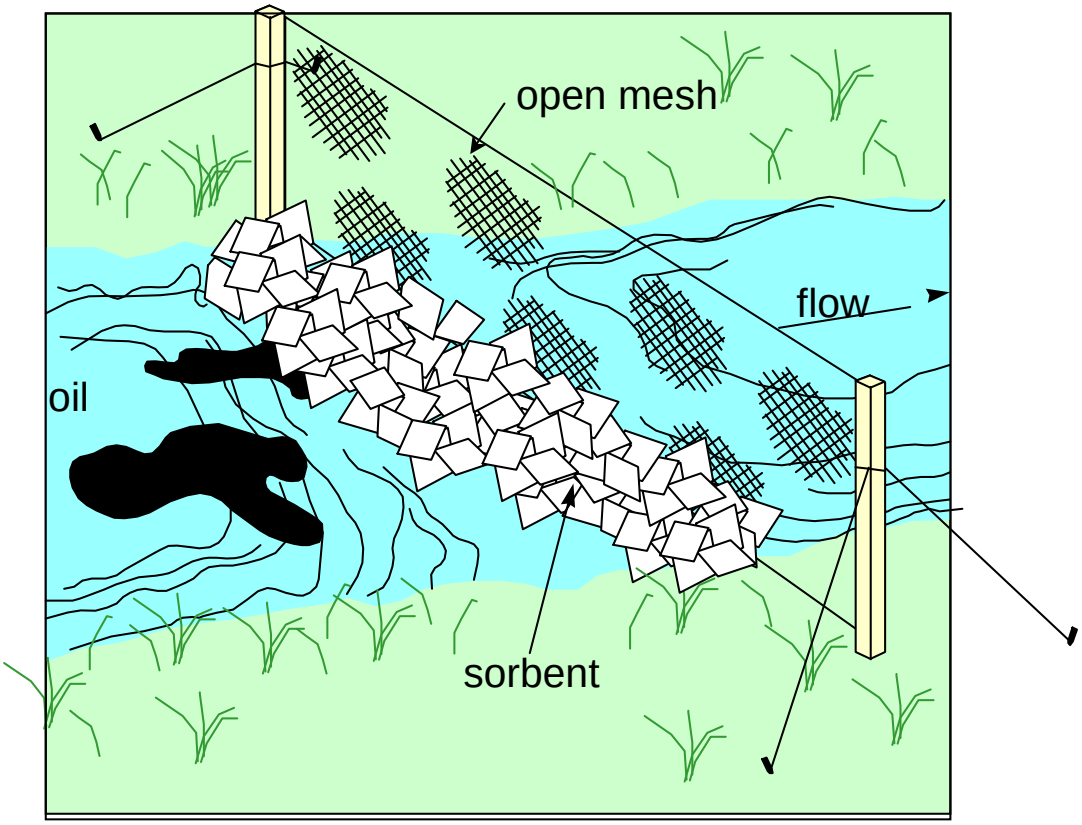
Booms

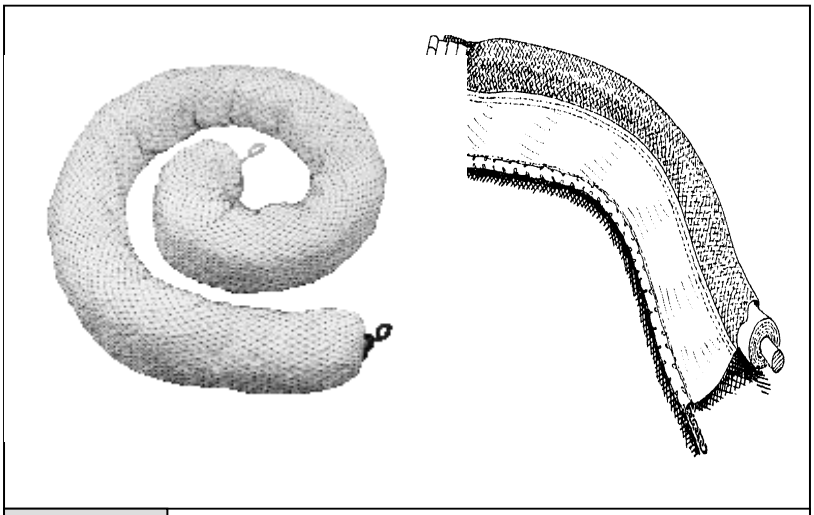
Booming with either absorbent or non-absorbent booms can also be an effective means of containing spills on slow-moving waters and in lakes. Effective containment using conventional booming techniques will be difficult in streams or rivers where currents exceed 0.7 knots (0.4m/s). At these speeds, oil will become entrained in the water flowing under the boom, resulting in significant Losses. Some improvements can be achieved in waters flowing at 1-2 knots (0.5-1 m/s) if the boom is deployed at an angle of less than 90 degrees to the direction of the flow.



Absorbent booms or socks can also be used to provide a barrier to floating oil. These types of booms should be checked regularly to ensure that they do not become saturated with either water or oil, since they will tend to float very low in the water or even sink and release oil downstream.

Filter Fence:





Booms	10 ft (3 m) by 6-10in(15-25 cm) used to contain spills in calm water

SPILLS ON ICE AND SNOW

Oil can remain relatively fresh, i.e, in an unweathered state under snow and ice for several months or more after a spill.

Evaporation rates will still be high when oil is ultimately exposed to the atmosphere, except in very low temperatures. Oil can also move up and down small hills (several metres high) due to the capillary action of the snow.

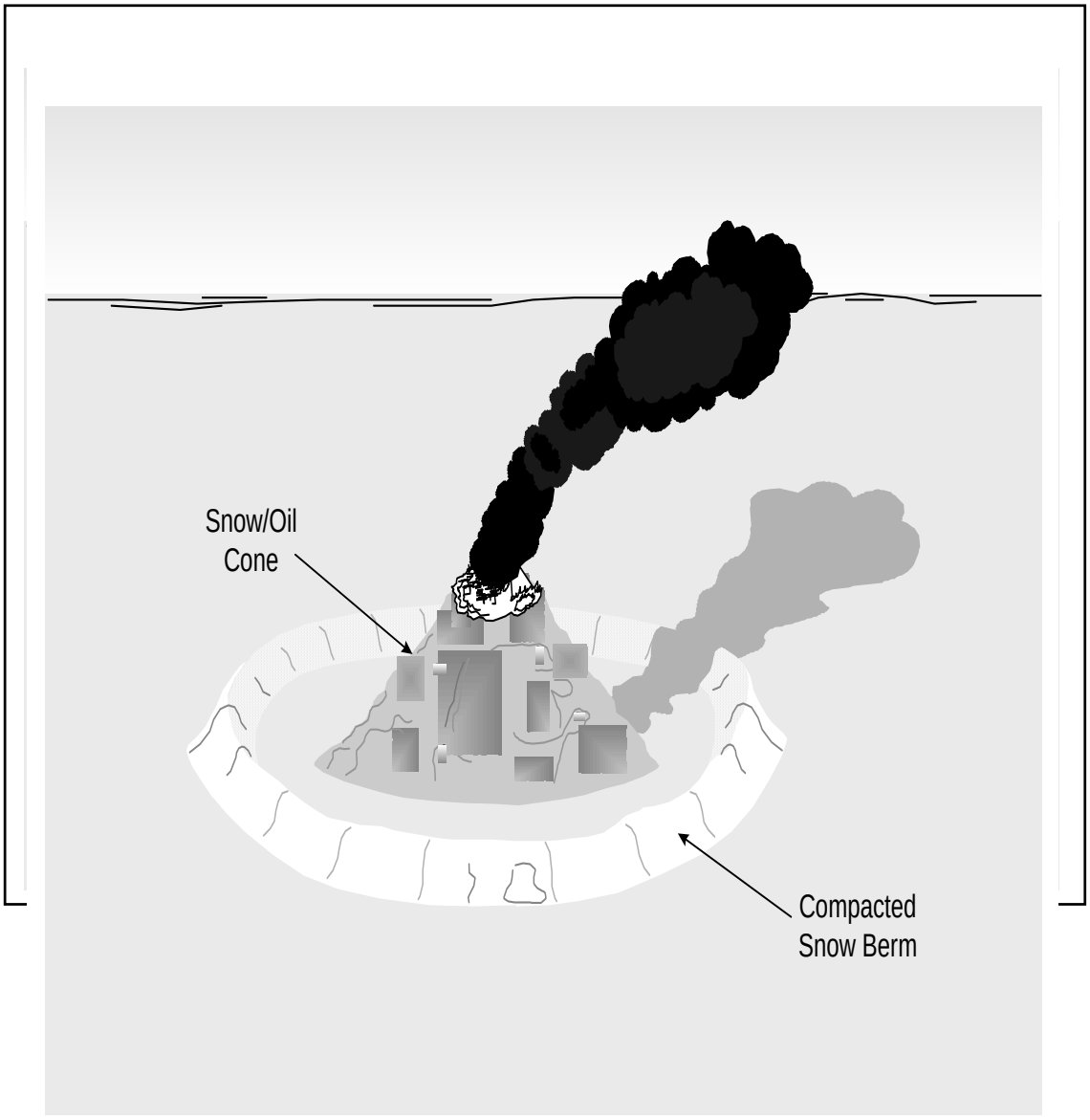
Containment

Snow and ice can be used to create berms to keep spills from spreading. In frozen rivers, angled slots about 1 m wide or holes can be cut in the ice, where safety permits, to allow possible spill recovery. The oil will rise up into the openings where it will concentrate and be available for recovery using skimmers or pumps.

Disposal

Oil spills in snow and ice can sometimes be burned if the spill can be isolated from the source. Although there is generally a reduced fire hazard, due attention to safety of operations is still required. If burning is not effective, recovered contaminated material will be collected and transported to a designated disposal/treatment facility.

Burning Snow Cone:



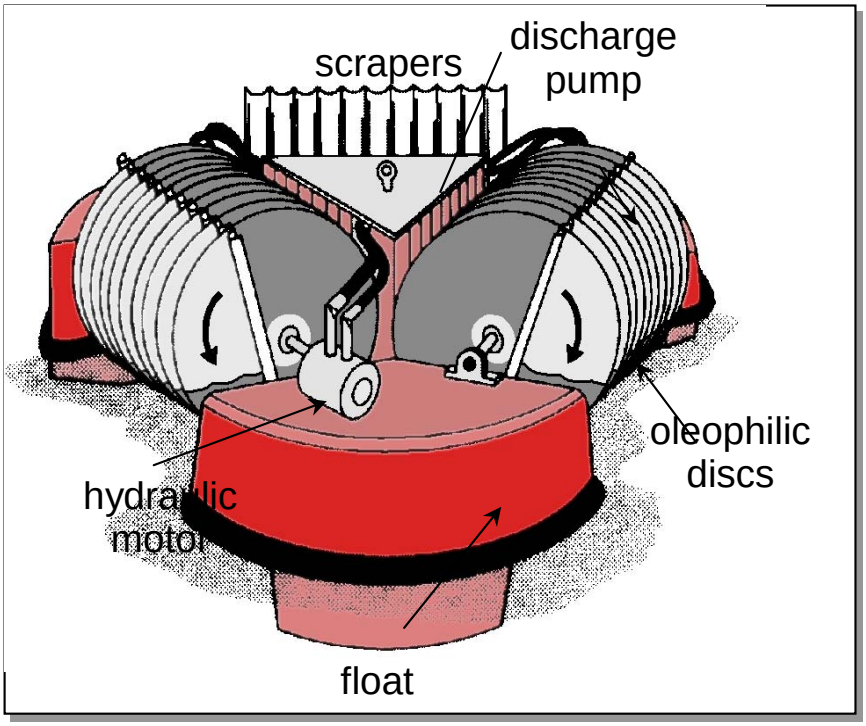
When large volumes of oil have been contained either through natural or mechanical containment, it will be necessary to remove or recover the accumulated oil. This will generally occur in excavated trenches or adjacent to berms or natural barriers and occasionally in slow running streams or quiet ponds.

Vacuum trucks are not feasible at fly-in sites, but would be suitable for sites served by a seasonal or winter road and where a large volume of oil has pooled that is generally free of water. The truck must be positioned at a safe distance so that there is no possibility of fire or explosion.

Oleophillic devices, such as disc or drum skimmers, can selectively recover oil in water, and are better suited to applications where the oil has formed a distinct layer on top of quiet water. Accumulations adjacent to an inverted weir are an example. A vacuum truck would be largely ineffective in this instance, since it would recover large amounts of water, particularly in a thin layer of oil with water flowing through the pipe or culvert.

When using disc or drum skimmers, ensure that small items of debris are periodically removed from the scrapers to ensure their efficient operation.

Disc Skimmer



APPENDIX TO SPILL CONTINGENCY PLAN – NANUQ NORTH PROPERTY

MATERIAL SAFETY DATA SHEETS (MSDS)

(See MSDS on CD accompanying original applications for a land-use permit and water licence). Should additional products be added, a new CD will be issued.)

MATERIAL SAFETY DATA SHEETS

FUELS, FUEL ADDITIVES, OIL
Nanuq Project – Spring-Summer 2011 [5] Programme

(See MSDS on accompanying CD)

MSDS-ATF Type F Oil-Petro-Canada-2010-CURRENT-Added to List
MSDS-Bombardier BRP XP-S Mineral 2-Stroke Injection Oil-413803000-Unregulated
MSDS-ChainOil-Light-Shell-2008-CURRENT
MSDS-Diesel Fuel Oil Conditioner-Kleen-Flo-2009-CURRENT
MSDS-DIESEL Fuel-PetroCan-2009-CURRENT
MSDS-Duron 10W-30 Heavy Duty EngineOil-PetroCan-2009-CURRENT
MSDS-Duron 15W-40 Heavy Duty EngineOil-PetroCan-2010-CURRENT
MSDS-HYDREX_MV 22_36_60-PetroCan-2009-CURRENT
MSDS-HYDREX_MV_Arctic_15-PetroCan-2008-CURRENT
MSDS-Jet A1-Shell-2008-CURRENT
MSDS-Jet A-A1-PetroCan-2009-CURRENT
MSDS-Jet B-PetroCan-2009-CURRENT
MSDS-Kleen Start-Starting Fluid-Kleen-Flo-2010-CURRENT
MSDS-Mobil Jet Oil 254-Esso-2008-CURRENT
MSDS-Mobil Jet Oil II-Esso-2007-CURRENT
MSDS-Petrol Unleaded-Shell-2010-CURRENT
MSDS-Petrol-Unleaded-PetroCan-2010-CURRENT
MSDS-Polaris 2T VES Synthetic Oil-2007-CURRENT
MSDS-Polaris Prem. Blue Semi-Synthetic Blend Oil-2007-CURRENT
MSDS-Propane-SuperiorPropane-2011-CURRENT-Updated
MSDS-Quaker State SAE 30 Motor Oil-2008-CURRENT
MSDS-Quick Start Ether Cylinders-2011-CURRENT-Added to List
MSDS-Rotella T 10W-30-CJ-4-Engine Oil-Shell-2009-CURRENT
MSDS-Rotella T 15W-40-CJ-4-Engine Oil-Shell-2009-CURRENT
MSDS-Snowmobile Motor Oil-PetroCan-2009-CURRENT
MSDS-Delo LE 400 Synthetic SAE 5W40-2008-CURRENT-Added to List

DRILLING MUDS, GREASES, LUBRICANTS
Nanuq Project – Spring-Summer 2011 [5] Programme

(See MSDS on accompanying CD)

MSDS-Aeroshell Fluid 41-Aircraft-2009-CURRENT
MSDS-Aeroshell Grease 7-Aircraft-2008-CURRENT
MSDS-Aeroshell Grease 22-Aircraft-2008-CURRENT
MSDS-API ModifThreadCompound-PetroCan-2009-CURRENT
MSDS-Brazilian WW Gum Rosin-2008-CURRENT-Added to List
MSDS-DD2000-MATEX-Control Chemical-2011-CURRENT-Updated
MSDS-Drill Rod Grease-PetroCan-2010-CURRENT
MSDS-Duron Synthetic Oil-Petro-Canada-2010-CURRENT-Added to List
MSDS-Enviro Grease- Drill Rod Grease-Poly-Drill-2008-CURRENT
MSDS-EP1_EP2-Precision-General-Purpose-2010-CURRENT-Added to List
MSDS-Grease OG-0-1-2-PetroCan-2010-CURRENT
MSDS-Insulating Cement R-ANH Refractories-2009-CURRENT-Added to List
MSDS-Lithium Complex Moly 3 or 5-Grease Warehouse-2007-CURRENT
MSDS-LPS 1 Premium Lubricant-2008-CURRENT
MSDS-LPS 2 Aerosol-PetrolDistillate-2009-CURRENT
MSDS-PD1300-Poly-Drill-2008-CURRENT
MSDS-Pure Vis-Mineral Oil Viscosifier-Poly-Drill-2009-CURRENT
MSDS-Traxon-80W-90-85W-140-PetroCan-2009-CURRENT
MSDS-Traxon Synthetic 75W-90-PtroCan-2009-CURRENT
MSDS-WD40-Aerosol-2008-CURRENT
MSDS-WD40-BulkLiquid-2008-CURRENT
MSDS-White Lithium Grease-Bulk-2010-CURRENT-Added to List
MSDS-CSB-Beet Juice Antifreeze-Westway-2007-most CURRENT-Added to List
MSDS-Rando HDZ Lubricating Oil-Chevron-2008-CURRENT-Added to List
MSDS-Bio Foam-Diversity Tech-2008-most CURRENT-Added to List
MSDS-Compro Compressor Fluid 32 68 100 150-Petro-Canada-2009-CURRENT-Added to List
MSDS-Alcomer 120L OS-Additive-Diversity Tech-2008-most CURRENT-Added to List
MSDS-Precision XL 3 Moly Arctic-Petro-Canada-2009-CURRENT-Added to List
MSDS-Rod Ease-Miswaco-2009-CURRENT-Added to List

MISCELLANEOUS CHEMICALS
Nanuq Project – Spring-Summer 2011 [5] Programme

(See MSDS on accompanying CD)

MSDS-ABC Fire Extinguisher-PyroChem-2011-CURRENT-Updated
MSDS-Acetylene-Air Liquide-2011-CURRENT-Added to List
MSDS-Back Off Bear Deterrent--2010-CURRENT
MSDS-Blueshield Pro Gouging Electrode-Air Liquide-2008-most CURRENT-Added to List
MSDS-Brake & Elec. Contact Kleen-2009-CURRENT
MSDS-Calcium Aluminate Cement-Kerneosinc-2010-CURRENT-Added to List
MSDS-Chevrolet Orange Spray Paint-Seymour Paint-2011-CURRENT-Added to List
MSDS-Dow Corning 736 Heat-Resistant Sealant-2010-CURRENT
MSDS-Electro Contact Cleaner-LPS Labs-2008-CURRENT
MSDS-Gloss Red-Barnes Distribution-Seymour Paint-2007-most CURRENT-Added to List
MSDS-Gloss White-Barnes Distribution-Seymour Paint-2010-CURRENT-Added to List
MSDS-Gun Blue-Bushnell-Aug2007-CURRENT
MSDS High Strength Threadlocker Red Automotive GradeHenkel-2008-CURRENT-Added to List
MSDS-Kleen-Flo Silicone Gasket Maker-2009-CURRENT
MSDS-Lacquer Thinner 13-554-Recochem-2007-CURRENT
MSDS-LaFarge Portland Cement--2008-CURRENT
MSDS-Lead-Acid-BATTERY-Exide-2008-CURRENT
MSDS-LePage Prestite Contact Cement-2008-Unregulated
MSDS-LePage Speed-Set Epoxy Hardener-2008-CURRENT
MSDS-LePage Speed-Set Epoxy Resin-2008-CURRENT
MSDS-Liqui-Bac-RML Co-2005-Unregulated
MSDS-Lock De-Icer-Kleen-Flo-2009-CURRENT-Added to List
MSDS-LPS A-151 Solvent Degreaser-incl. Aerosol-2010-CURRENT
MSDS-Marking SPRAY PAINT-RustOLeum-2008-CURRENT
MSDS-Methyl Ethyl Ketone Solvent-Scienlabs-2008-CURRENT
MSDS-Methyl Hydrate 13-390-Alcohol Solvent-Recochem-2009-CURRENT
MSDS-Motomaster Elec. Contact Cleaner-ShraderCanada-2008-CURRENT
MSDS-Nitrogen-Inert-Undated-CURRENT
MSDS-Non-Flammable Gas Mixture-Gas Liquide-2010-CURRENT-Added to I
MSDS-Original Gas Line Anti-Freeze-Kleen-Flo-2009-CURRENT-Added to List
MSDS-Oxygen (gas liquid)-Various Uses-Air Liquide-2008-CURRENT
MSDS-Oxygen Medical-Airgas Company-2007-CURRENT
MSDS-Petro-Canada-Antifreeze-2010-CURRENT-Added to List
MSDS-PRIST Aviation Glass Cleaner Aerosol-2010-CURRENT
MSDS-Rad Seal Radiator Stop Leak-Kleen-Flo-2009-CURRENT-Added to List
MSDS-RTV Red Silicon Sensor-Safe Hi-Temp GasketMaker-LocTite-2008-most CURRENT-Added to List
MSDS-Snowmobile Antifreeze 50-50 PreMix PG-Polaris-2007-CURRENT

MISCELLANEOUS CHEMICALS (cont.)

MSDS-Winter Universal Gas Line Antifreeze-PetroCan-2010-CURRENT
MSDS-Wurth Brake Cleaner 4L-2009-CURRENT
MSDS-Boss Lubricants Propylene Glycol Antifreeze-2009-CURRENT
MSDS-Univar Propylene Glycol USP/EP-2009-CURRENT