Spill Response Plan – Arctic Operations Advisor Course :

1 January 2010
20 September 2012 (1st Revision)
17 September 2015 (2nd Revision)

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1) Introduction

The Canadian Army has prepared this spill contingency plan for the completion of the Arctic Operations Advisor Course (AOA) which takes place annually in the vicinities of Yellowknife, NT and Resolute Bay, NU. While conducting the AOA, support for spills will be provided by Joint Task Force (North) (JTF(N)).

i) Contact Information

Joint Task Force (North)
PO Box 6666, Station Main
Yellowknife, NT
X1A 2R3
Phone: (867) 873-0700 extension 6880
Fax: (867) 766-6803
Attention: Captain Frank Dion, JTF(N)

Canadian Forces Land Advanced Warfare Centre
PO Box 1000, Station Forces
Astra ON
K0K 3W0
Phone: 613-392-2811 ext.2444
Attention: Capt. Wayne Leblanc, Course Commander, AOA

ii) Effective Date of Spill Contingency Plan

January 1, 2010

iii) Last Revision to Spill Contingency Plan

September 17, 2015

iv) Distribution List

The most recent version of this plan has been distributed to:

Capt. Frank Dion, Environmental Officer, JTF(N)

Capt. Wayne Leblanc, Course Commander, AOA

v) Purpose and Scope

The purpose of this plan is to outline response actions for potential spills that could take place during the AOA which will take place annually in the vicinity of Yellowknife, NT and Resolute Bay, NU. The plan identifies key response personnel and their roles and responsibilities in the event of a spill, as well as the resources available for spill responding. It details spill response procedures that will minimize potential hazards to the environment and to human health and safety while also detailing procedures which will facilitate spill containment and recovery. The plan is prepared to ensure quick access to all the information required for spill responding.

vi) Company Environmental Policy

In order to produce a combat effective, sustainable Land Force, the Army requires a healthy and diverse environment to conduct training and support activities today and into the future. Army activities can potentially impact all major Canadian ecosystems; therefore, it is essential to support sustainable management practices. To ensure the sustainable environmental management of our, garrisons, firing ranges, training areas, assets and activities the Army is committed to:

- Complying with Federal legislation and conforming to municipal, provincial/territorial and international standards, as applicable;
- Respecting Federal environmental directives and policies including the Department of National Defence and Canadian Forces Code of Environmental Stewardship;
- Taking environmental factors into account in all decision making;
- Preventing pollution from Army activities and encouraging best practices;
- Establishing Army environmental priorities and objectives though the business planning process; and
- Continually improving our environmental management.

Army Commanders at all levels shall ensure that the requirements outlined in this policy are implemented and communicated throughout their organization. The active involvement of all organizations and personnel supporting the Army mission will help ensure that we meet our environmental management goals.

Prior to the commencement of the AOA course, this plan will be communicated to all course personnel.

vii) Project Description

The AOA course is conducted annually in the months of February and March. The course consists of two phases: A sub-arctic phase which is proposed to occur in the vicinity of Yellowknife, NT and a high-arctic phase which is proposed to occur in the vicinity of Resolute Bay, NU. The purpose of the AOA is to annually train approximately 35 Army Specialists capable of providing advice to their Commanders regarding arctic deployments and training under cold weather conditions.

viii) Site Locations

Exact site locations for the AOA will change annually. However, each year resources will be drawn from facilities within and surrounding the City of Yellowknife, NT and the Community of Resolute Bay, NU for the sub-arctic and high-arctic portions of the course respectively. For the 2010 iteration of the course field training will take place at the following sites:

<u>Sub-Arctic Phase:</u>

Initial Training Area (western edge followed by eastern edge):

- N62° 28’ 04.2’’ W114° 29’ 46.6’’
- N62° 28’ 15.3’’ W114° 28’ 07.3’’

Bivouac Site:

- N62° 21’ 50.7’’ W114° 29’ 59.6’’

Contingency Bivouac Site:
- N62° 21’ 39.4’’ W114° 32’ 29.5’’

Yellowknife Rifle Range:
- N62° 28’ 02.2’’ W114° 28’ 28.0’’

Bluefish Hydroelectric Station:
- N62° 40’ 19.5’’ W114° 15’ 43.8’’

<u>High-Arctic Phase:</u>

Resolute Bay:
- N74º 43’ 01”, W 94º 58' 10"

Cambridge Bay:
- N69º 07' 02", W105º 03' 11"

Gjoa Haven:
- N68º 37' 33", W 95º 52' 30"

Taloyoak:
- N69º 32' 13", W93º 31' 36"

Kugaaruk:
- N68º 31’ 59" , W89º 49’ 36"

Polar Continental Shelf Project (PCSP):
- N74º 43’ 07.1", W94º 59’ 23.9"

Repulse Bay:
- N66º 31' 19", W86º 14' 06"

Arctic Bay:
- N73º 02' 11", W85º 09' 09"

Pond Inlet:
- N72º 41' 57", W77º 57' 33"

Grise Fjord:
- N76º 25' 03", W 82º 53' 38"

Igloolik
- N69° 22’ 34’’, W81° 47’ 58”

Clyde River:
- N70° 28’ 26”, W68° 35’ 10”

ix) List of Hazardous Materials On-site

No permanent storing of hazardous materials will occur during the AOA. Diesel and gasoline for the respective operation of BV-206s and skidoos will be obtained from the City of Yellowknife or

the Community of Resolute Bay and transported into the field daily or as required. In addition to the vehicle tank capacity, all vehicles will carry 1 emergency jerry can of fuel (20 L). With the exception of emergency situations, vehicle refuelling in the field will be done within a bermed POL point located in the vicinity of the bivouac site at a distance greater than 30 m from all water bodies. Ten (10) 1-Litre Bottles of Naphtha will be used per day in each of 4 10-person Army tents. As with vehicle fuel, Naphtha bottles will be transported into the field daily or as required, with empty bottles being redeployed following resupply. Bermed POL points will be established adjacent to individual tents for the storage of camp stove fuel.

Table 1: List of hazardous material stored on-site, type of storage container, the maximum storage quantities, storage locations and uses[1].

Material	Storage Container	Maximum Amount On-site	Storage Location and Uses
Gasoline	20 L vehicle tank 20 L jerry cans	2160 L (54 vehicle tanks + 54 jerry cans)	Jerry Cans secured in/on trail boggans/komaticks or within bivouac POL point. Used to fuel skidoos.
Diesel	120 L vehicle tank 20 L jerry cans	280 L (2 Vehicle Tanks + 2 jerry cans)	Jerry Cans secured in/on trail boggans/komaticks or within bivouac POL point. Used to fuel BV-206.
Naphtha	1 L bottles	40 L (40 bottles)	Individual tent POL points. Used to fuel camp stoves.

x) Existing Preventative Measures

Given the remote nature of the AOA site locations spill prevention is extremely important. The following preventative measures are in place to prevent spills during the course.

- Course participants will be briefed on the spill response plan prior to the commencement of field training;
- A light oversnow vehicle course (skidoo) will precede the field training portion of the course to ensure that all CF personnel can safely operate and maintain their vehicles;
- Drivers of the BV206s will receive appropriate operator training prior to the course;
- The fleet of vehicles used during the course will be maintained in good condition by JTF(N) personnel and/or course staff;
- Fuel will be secured during transport;
- Spill kits will be contained within the BV206s and at the section level (i.e. one spill kit per every 12 skidoos);
- Fuel transfers will take place over drip trays and/or appropriate spill absorbent material;
- Refuelling will be conducted within POL points established at least 30 m away from any water bodies.
- POL points will be bermed.
- Course participants will conduct daily inspections to check for vehicle leaks and/or damage to fuel storage containers.

xi) Additional Copies

[1] MSDS sheets are available in all spill kits.

A copy of this spill response plan will be kept with the course commander and with each spill kit. A copy will also be held by the JTF(N) Environmental Officer.

2) Potential Causes and Consequences of HAZMAT Spills During the AOA

i) Spill Definitions

Major Spills

Major spills are immediately reportable releases that:

- Involve the release of a substance that is likely to be imminently hazardous to human health and safety or to the environment;
- Involve a quantity of material that meets or exceeds the amounts found in appendix A; or
- Involve the release of fuel or hazardous material, **of any quantity**, if the spill occurs adjacent to or within a water body or other sensitive environment.

Minor Spills

Minor spills are those that:

- Do not involve the release of a substance that is likely to be imminently hazardous to human health and safety or to the environment;
- Involve a quantity of material that falls below the amounts found in appendix A; or
- Do not involve the release of fuel or hazardous material adjacent to or within a water body.

The primary hazardous materials used in the AOA (Gasoline, Diesel Fuel, Naphtha) are all POL products.

In accordance with Environmental Directive 4003 – 1/2003 for POL product spills in non-sensitive environments:

- A **major spill** involves a spill **greater than 50 L**
- A **minor spill** involves a spill of **between 1 L and 50 L** where all released product is not recovered.

Table 2: List of Hazardous Materials, Potential Spill Events and Potential Spill Volumes

Hazardous Material	Potential Spill Event	Likely Spill Volume	Worst Case Spill Volume
Gasoline (skidoo)	1) Leak in gas tank 2) Improperly secured lid on jerry can 3) Damaged jerry can 4) Spill during fuel transfer 5) Vehicle turnover	Likely under 20 L (volume of both the vehicle tank and the jerry can).	2160 L (max volume of gasoline in the field at 1 time = 54 vehicle tanks + 54 jerry cans)
Diesel Fuel (BV206)	1) Leak in gas tank 2) Improperly secured lid on jerry can 3) Damaged jerry can 4) Spill during fuel transfer 5) Vehicle turnover	Likely under 120 L (volume of vehicle tank)	280 L (max volume of diesel in the field at 1 time = 2 vehicle tanks + 2 jerry cans)
Naphtha (Camp Stove)	1) Punctured container 2) Spill during fuel transfer	Likely under 1 L (volume of naphtha container)	40 L (max volume of naphtha in the field at 1 time = 40 1 L bottles)

ii) Potential Environmental Impacts

The environmental impacts of the hazardous materials used during the AOA are mitigated to a degree by the time period within which the course takes place annually. Given that snow is a natural sorbent and ice forms a barrier which can limit or eliminate soil and water contamination spills that occur during the AOA are more likely to be readily recovered then spills that would occur at other times of the year.

Gasoline:
Gasoline has the potential to adversely impact upon the health of humans as well as terrestrial and aquatic wildlife. Gasoline is not readily biodegradable and thus has the potential to bioaccumulate in the environment. Gasoline is a highly volatile material which can make complete recovery difficult. Special care should be taken in the event of a spill to ensure that gasoline does not enter any open water bodies.

Diesel Fuel:
Diesel has the potential to adversely impact upon the health of humans as well as terrestrial and aquatic wildlife. Diesel is not readily biodegradable and thus has the potential to bioaccumalte in the environment. Diesel is much less volatile than gasoline and thus diesel spills are more readily recovered than gasoline spills. Special care should be taken in the event of a spill to ensure that diesel fuel does not enter any open water bodies.

Naphtha:
Naphtha has the potential to adversely impact upon the health of humans as well as terrestrial and aquatic wildlife. Terrestrial wildlife can be especially sensitive to naphtha as they may ingest it during pelage cleaning. Naphtha is readily biodegradable; however, biodegradation will be slowed under the winter conditions of the sub-arctic and high-arctic environments. Special care should be taken in the event of a naphtha spill to ensure that the product does not enter any open water bodies.

3) Spill Procedures

This section outlines the steps that will be taken by AOA personnel in the event of a spill. A flowchart outlining the spill response procedure is found in appendix B.

i) Initial Actions

A. Ensure safety of all personnel**.**

B. Determine the hazards and potential hazards of the spill.

C. Remove any possible ignition sources

D. Assess the spill. Take note of any information that will be useful in reporting the incident (material spilled, volume spilled, location of spill, time of the spill, etc.)

E. Notify the Course Commander regardless of the spill volume.

F. In the case of a minor spill:

1. If safe to do so stop the spill at its source. Ensure that appropriate protective equipment is utilized as required.

2. Contain the spill to prevent further environmental contamination.

3. Contact the JTF(N) Operations Duty Officer at *Tel.* 867-873-0700 6772 (CSN 766-6772) *Cell.*(867-765-8607)
4. Inform the JTF(N) Environmental Officer (867-873-0700-6880), *Cell.* (867-445-4062) or JEngr (867-873-0700-6017) or the JTF(N) Environmental Coordinator (867-873-0700-6083)

G. In the case of a major spill:

1. If safely possible limit the amount of contaminate at the source.

2. Contact the JTF(N) Operations Duty Officer at *Tel.* (867-873-0700 6772) (CSN 766-6772), *Cell.*(867-765-8607).

3. If safe to do so, limit the spread of the spill with priority being given to preventing spread into open water bodies.

4. The JTF(N) Operations Duty Officer will contact the JTF(N) Environmental Officer and/or the JTF(N) HAZMAT Emergency Response Team Leader who will determine and mobilize the resource required to further contain the spill.

ii) Spill Reporting

A. All spills, **regardless of their size**, that take place as a result of the Arctic Operations Advisor Course will be reported to the Course Commander as soon as it is safely possible to do so.

B. As required by JTF(N), the course participant who causes or discovers a spill must complete the JTF(N) spill report form (appendix C). The completed form must be submitted to the JTF(N) Environmental Officer or the JTF(N) Environmental Coordinator within 24 h of the spill occurring.[2]

C. In accordance with Environmental Directive 4003 – 1/2003 within 24 h of a spill the JTF(N) Environmental Officer will report the spill up the chain-of-command to NDHQ/DGE. **All spills resulting from the AOA which occur on lands which are not under the administrative control of DND will be reported to NDHQ/DGE**.

D. In accordance with Territorial regulations the JTF(N) Environmental Officer will report any major spills that occur during the Arctic Operations Advisor Course on the **NT-NU 24 hr spill report line (867-920-8130).** The JTF(N) Environmental Officer will also be responsible for completing the associated spill reporting form.

E. All spill kits used during the AOA will contain extra copies of the JTF(N) spill response form.

iii) Spill Reporting Contacts

A. JTF(N) Operations Duty Officer
Phone: 867-765-8607

B. JTF(N) Environmental Officer
Phone: (867-873-0700-6880)

Or

JEngr
Phone: (867-873-0700-6017)

C. JTF(N) Environmental Coordinator
Phone: 867-873-0700-6083

D. NT-NU 24 h Spill Line
Phone : 867-920-8130
Fax : 867-873-6924
Email : spills@gov.nt.ca

[2] Given the nature of the AOA and the potential for a spill to occur in a remote location, the information required in the JTF(N) Spill Report may be provided to the JTF(N) Environmental Officer through other means of communication.

iv) Procedure for Containing and Controlling a Spill

A. Assess the environment and determine what will or has the potential to be impacted upon by the spill.

B. Assess the movement of the spill and cause of the movement (wind, slope, etc.)

C. Determine where and how to contain the spill. Ensure that open water bodies are avoided.

D. Consider alternative containment strategies ahead of time in case initial efforts prove unsuccessful or conditions change.

v) Containment Techniques for Spills Occurring on Snow and Ice

Given the time period and locations within which spills are likely to occur during the AOA this section provides guidance into specific methods that can be used for containing spills that occur on snow and ice. Note that the guidance provided in this section is not intended to be all encompassing and does not supersede any recommendations of the JTF(N) Environmental Officer or the JTF(N) Environmental Coordinator.

A. Spills on snow:

Recovery of spills on snow is facilitated by the fact that snow is a natural sorbent. Generally speaking, small spills on snow can be completely recovered by using shovels to collect and transfer contaminated snow into appropriate plastic bags.

Dykes:
For larger spills occurring on snow, snow can be compacted and mounded down slope from the spill to form a dyke. This method can be augmented by placing a plastic tarp over the dyke in a manner that causes the spill to pool at the base of the barrier. Once the spill is contained, contaminated snow can be shovelled into appropriate plastic bags or collected using appropriate absorbent materials.

B. Spills on ice:

Spills occurring on ice are amongst the easiest to contain as ice is largely impermeable to POL. However, all appropriate measures should be taken to ensure that spills do not enter ice covered water bodies as spills that seep under ice are amongst the most difficult to contain and recover. In general small spills on ice can be recovered using sorbent materials with shovels being used to scrape together and transfer any remaining contaminated ice and slush into appropriate plastic bags.

Dykes:

For larger spills occurring on ice, surrounding snow can be compacted down slope of the spill and mounded to form a dyke to contain the spill. This method can be augmented by placing a plastic tarp over the dyke in a manner that causes the spill to pool at the base of the barrier. Once the spill is contained, contaminated snow can be shovelled into appropriate plastic bags or collected using appropriate absorbent materials.

Trenches:

For more significant spills trenches can be cut into the ice surrounding and/or down slope of the spill to allow for the spill to pool into the trench. Pooled product can subsequently be collected with absorbent materials or mixed with snow and shovelled into appropriate plastic bags. Personnel should contact the JTF(N) Environmental Officer or the JTF(N) Environmental Coordinator prior to trenching as this technique may increase the probability of a spill seeping under the ice.

Burning:

Burning of POL spills on ice is to only be conducted as a last resort and may not occur without the permission of the JTF(N) Environmental Officer or the JTF(N) Environmental Coordinator as burning can not be conducted without the approval of Indian and Northern Affairs Canada.

vi) HAZMAT Disposal

Plastic bags containing contaminated snow, ice, slush and or spill absorbent materials will be transported and disposed of as directed by the JTF(N) Environmental Officer or the JTF(N) Environmental Coordinator. Contaminated materials will not be disposed of at municipal sites without receiving prior authorization from the facility.

vii) Restoration of Affected Areas

As required and once all hazardous materials have been removed, the JTF(N) Environmental Officer will be responsible for coordinating with appropriate territorial and federal authorities to determine the level of site reclamation required.

4) Resource Inventory

i) On-site resources

Four (4) large emergency spill kits will be kept (2 at the bivouac site and 2 with the supply). Each kit contains:

- a spill instruction sheet;
- one 36”x 36” neoprene drain cover;
- one epoxy stick;
- one roll of duct tape; and
- two absorbent packs – stock number CN-ESK-01 (which contain: 5-17”x19” laminated polypropylene absorbent pads; 1-4L bag multizorb universal absorbent; 1-10’ polypropylene sock for oil only; 1-4’ polypropylene sock for oil only; 2 disposal sacks and crossties; 2 adhesive caution labels; and 1 pair of nitrile gloves).

Smaller emergency spill kits will be kept at the section level (i.e. one kit per 9 course candidates, 1 instructor and 2 Canadian Rangers).

ii) Off-site resources

As required off-site resources will be mobilized by the JTF(N) Environmental Officer and/or the JTF(N) HAZMAT Emergency Response Team Leader.

5) Training Program

Participants of the AOA will be briefed prior to the commencement of field training on the spill response plan and will be made aware of the location and contents of spill kits. JTF(N) personnel providing HAZMAT spill response support to the AOA receive spill response training as required for their positions.

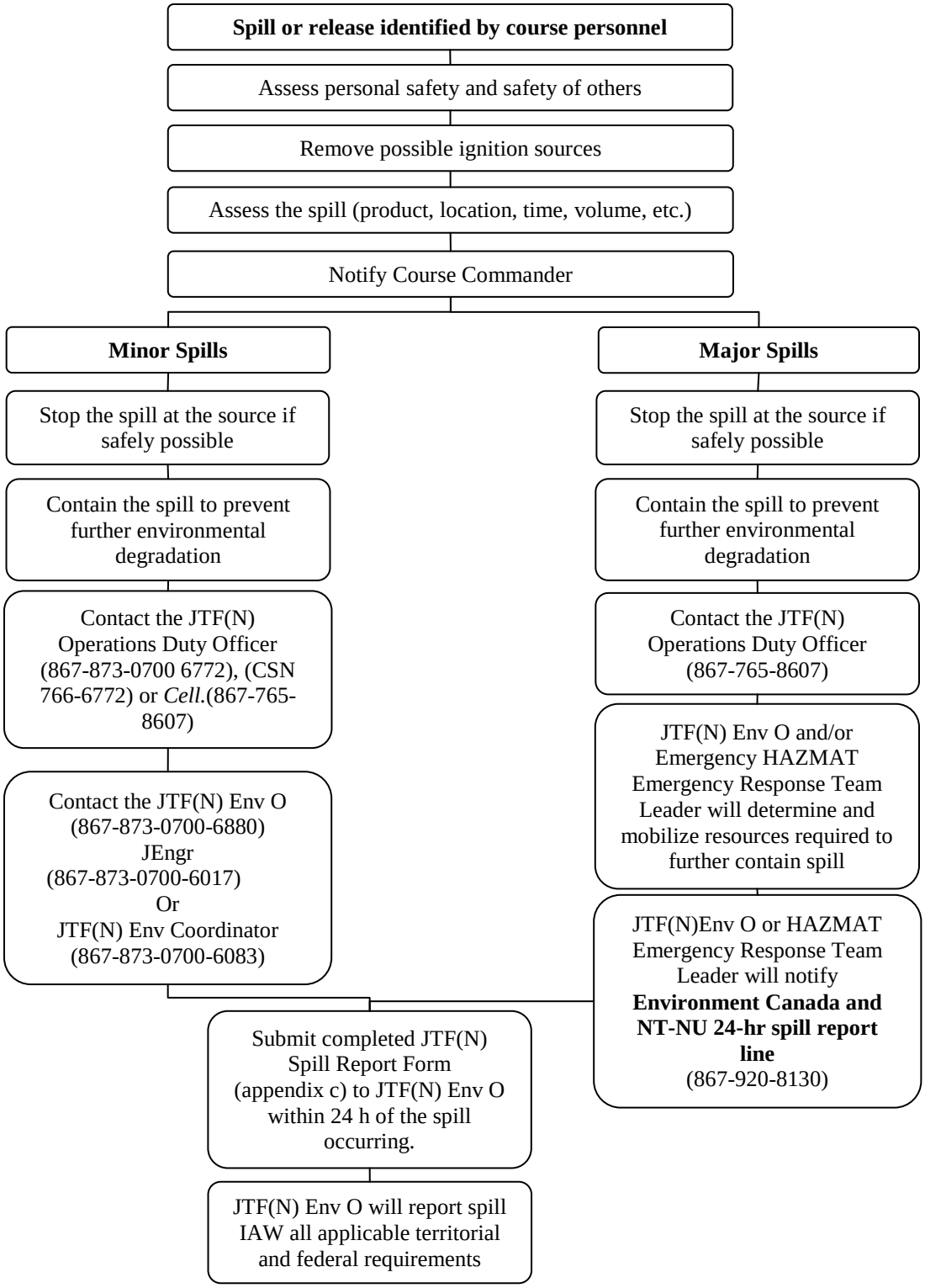
Appendix A: Immediately Reportable Release Quantities

TDG Class	Substance	Immediately Reportable Quantity
1 2.3 2.4 6.2 7 None	Explosive Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive Unknown Substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from a container with a capacity greater that 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 35 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substance excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemical, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

In addition a HAZMAT release of any amount must be immediately reported if it:

- **Poses an imminent threat to human health and safety;**
- **Poses an imminent threat to listed species at risk or its critical habitats;**
- **Occurs within or adjacent to a water body;**
- **Occurs within or adjacent to a designated sensitive environment;**
- **Occurs within or adjacent to a designated wildlife habitat.**

Appendix B: Spill Response Flow Chart



Appendix C: JTF(N) HAZMAT Spill Report Form

<table>
<tr><td colspan="3">JTFN Spill Report</td></tr>
<tr><td>Reported by:</td><td>Local:</td><td>Section:</td></tr>
<tr><td>d. Date of spill:</td><td>Time of spill:</td><td>Date reported:</td></tr>
<tr><td colspan="3">2. Source of Spill:</td></tr>
<tr><td colspan="3">3. Spill location (Bldg #, Address, FOL, Float Dock, GPS coordinates, etc):</td></tr>
<tr><td colspan="3">4. Type of Material Spilled:</td></tr>
<tr><td colspan="2">5. Quantity spilled (kg or litre):</td><td>6. Quantity recovered (kg or litre):</td></tr>
<tr><td colspan="3">7. Events leading up to Spill:</td></tr>
<tr><td colspan="3">8. Action taken to mitigate the effects of the spill:</td></tr>
<tr><td colspan="3">9. Further important information:</td></tr>
<tr><td colspan="3">10. Distance from the point of release to the following (in metres):</td></tr>
<tr><td>e. Ditch:</td><td colspan="2">b. Catch basin or drain :</td></tr>
<tr><td>c. Property boundary :</td><td colspan="2">d. Surface water :</td></tr>
<tr><td colspan="3">Environment File #:

Off-base agencies contacted (name, phone #, time, date):</td></tr>
</table>

Appendix D: References

A) Canadian Army Environmental Policy, 2013
B) JTFNO Hazmat Release Plan 2014
C) AANDC Guidelines for Spill Contingency Planning, April 2007.
D) Environmental Protection Act, Consolidation of Spill Contingency Planning and Reporting regulations, R.R.N.W.T. 1990, c.
E) Material Safety Data Sheet, Unleaded Gasoline, Petro-Canada, 2008
F) Material Safety Data Sheet, Diesel Fuel, Petro-Canada, 2007
G) Material Safety Data Sheet, Coleman Camp Fuel, HOC Industries Inc., 2007