



# **Appendix F**

## **Spill Contingency Plan**



## Nanisivik Naval Facility

Spill Contingency Plan  
Revision 2

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July 2013

**Stantec**

**NANISIVIK NAVAL FACILITY**

**SPILL CONTINGENCY PLAN**

Revision 2

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INITIAL SPILL RESPONSE

ENSURE SAFETY

A. RESPOND QUICKLY

1. Ensure safety of all persons.
2. Identify hazards and risks.
3. If safely feasible, stop the release.
4. Call for help.
5. Contain the spill if safely possible.

B. CONTAINING THE SPILL

1. Ensure safety of all persons
2. Identify what will be affected.
3. Determine the cause(s) for movement of the released substance (wind, slope, water)
4. Identify the best location to contain the spill (avoid water bodies).
5. Consideration must be given to a back-up plan.

C. REPORTING PROCEDURE

1. The Nunavut Spill Report form must be completed to the extent possible prior to submission. The Nunavut Spill Report form is attached in Attachment A.
2. Contact the Nunavut 24-hour Emergency Spill Report Line at 867-920-8130.
3. If fax is available, the Nunavut Spill Report form should be faxed to **867-873-6924**. Or, if email is available, the Nunavut Spill Report form should be sent to [spills@gov.nt.ca](mailto:spills@gov.nt.ca).

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Attachment A – Nunavut Spill Report Form

## **1.0 Introduction**

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Stantec Consulting Ltd. (Stantec) has prepared this Spill Contingency Plan (the Plan) on behalf of the Department of National Defence (DND) and Defence Construction Canada (DCC). This Plan is intended to be a living document.

DND proposes to construct and operate a deep-water docking and refuelling facility at Nanisivik, Nunavut (Nanisivik Naval Facility; the Project). The Project is on 43.7 hectares (ha) of Federal Crown land at approximate latitude 73°N and longitude 84°W, at the northwestern end of Baffin Island. DND and DCC are committed to implementing appropriate procedures to reduce the risk of spills during all phases of the Project. This Plan conforms closely to the Aboriginal Affairs and Northern Development Canada Guidelines for Spill Contingency Planning (Indian and Northern Affairs Canada 2007).

## **2.0 Purpose and Scope**

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The proposed Project will serve primarily as a deep-water berthing and refuelling facility to serve the Arctic Offshore Patrol Ships (AOPS), Canadian Coast Guard and other government ships during the navigable season in the Northwest Passage (i.e., July to October). The nearest community to the Project site is Arctic Bay, which is approximately 33 km southwest of the facility and accessible via a gravel road.

The primary objective of this Spill Contingency Plan is to help reduce or eliminate any adverse environmental effects that may result from a spill of hazardous substances during the construction and operation of the Nanisivik Naval Facility. The Plan proposes guidelines for the safe handling, storage, use and disposal of potentially hazardous materials as well as spill prevention measures.

Access to the Spill Contingency Plan is imperative to help prevent spills and ensure appropriate action in response to a spill. A copy of this Plan will be kept at every location where fuel is stored. Additional copies should also be retained by the contractor and Nanisivik Naval Facility Manager.

### **3.0 Potential Contaminants**

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During construction and operation there are several contaminants that may be used for equipment and by crews working on the Project. The responsibility of spill prevention will be managed by the contractor during construction phases of the Project. The responsibility of spill prevention will be managed by DND during operation of the Project. Some of the anticipated contaminants are listed below:

- Gasoline
- Diesel
- Aviation Fuel
- Naval distillate
- Lubricating oils and grease
- Antifreeze and other coolants
- Hydraulic oil
- Motor oil
- Batteries
- Janitorial supplies
- Paint and corrosion protection coatings

A release of contaminants could unintentionally occur on land or in water. Possible mechanisms for a release of hazardous material include:

- Leaks or ruptures of fuel storage tanks
- Valve or line failure in systems, vehicles or heavy equipment
- Improper storage resulting in overfilling or heat expansion
- Vehicular accidents
- Spill during transfer or contaminant
- Vandalism

#### **3.1 STORAGE ON-SITE**

Below are the details of the anticipated storage facilities, methods of disposal and preventative measures incorporated into the design of the Project to prevent spills.

##### **3.1.1 Fuel**

The Nanisivik Naval Facility will serve as a deep-water refuelling station for the AOPS; therefore, bulk storage of naval distillate will be required, along with diesel and aviation fuel to support operation of the facility. Quantities of fuel stored at the facility, and the location of the storage, is outlined in Table 1.

**Table 1 - Fuel Storage Capacity at the Nanisivik Naval Facility**

Location	Fuel	Volume (L)	Storage
Bulk Liquids Storage Facility	Naval distillate	7.5 million	Two 22-m diameter vertical tanks
	Diesel	100,000	Two 3-m diameter horizontal tanks
	Aviation fuel	3,000	15 drums

Naval distillate will be stored in two 22 m diameter aboveground single-walled, vertical tanks. Each naval distillate tank will have 3,750,000 L storage capacity. This will provide the Nanisivik Naval Facility with the capacity to store 7.5 million litres of naval distillate (a one year fuel supply). Piping and pumping will be designed to allow transfer of naval distillate between the two tanks. Naval distillate will be transferred from the Wharf receiving facility to the Bulk Liquids Storage Facility for storage, and from the Bulk Liquids Storage Facility to refuel vessels at the Wharf. Flow metering equipment will be installed to monitor and control the flow rate.

A one and a half to two year supply of diesel (approximately 100,000 L) will be stored in two pre-fabricated 3 m diameter aboveground double-walled, horizontal tanks. Each diesel tank will have 81,000 L storage capacity. This will provide the Nanisivik Naval Facility with the capacity to store 162,000 L of diesel. Piping and pumping will be designed to allow transfer of diesel between the two tanks, from the Wharf receiving facility to the Bulk Liquids Storage Facility and from the Bulk Liquids Storage Facility to the electrical power generation modules. A dispenser will be installed for fuelling mobile equipment and flow metering equipment will be installed to monitor and control the flow rate.

Each naval distillate tank at the Bulk Liquids Storage Facility will have a separate secondary containment cell. Containment cells will consist of compacted gravel containment berms lined with an arctic-rated geomembrane liner covered with a 0.15 m layer of compacted gravel. The containment berms for the naval distillate storage tanks will be 1.8 m high. Both diesel tanks will be contained in one common cell consisting of an engineered steel containment dike system. The height of the containment walls for the diesel storage tanks will be 0.7 m above the surrounding grade. The containment cells are sized to 110% of the capacity of the respective tank. Leak detection systems and rainwater and melt water collection systems will be installed. A portable pump will be used to manage accumulated water from bermed areas.

Naval distillate and diesel pumps will be located at the northeast corner of the Bulk Liquids Storage Facility. Pipelines will connect the Wharf receiving facilities to the pumps: 250 mm diameter for naval distillate and 150 mm diameter for diesel. The pumps (30 hp for naval distillate and 7.5 hp for diesel) will be mounted on an outdoor structural steel platform and enclosed by a 0.25 m containment berm lined with an arctic-rated geomembrane liner covered with a 0.15 m layer of compacted gravel. Pipelines will be above-ground, supported by concrete foundations on grade and grounded.



Welded steel drip pans will be installed to contain leaks and drips under the Wharf ship-to-shore connection, at all hose connection points and under sample points. Mobile equipment diesel refuelling stations and all areas for storage of hydrocarbons will be equipped with a containment area and liner.

Instrumentation consisting of local indication and manual tank level indication will be either temperature durable or removable for winter storage. All PLC controls for fuel transfers will include a removable system that can be stored securely in a heated area for the winter.

Forty drums of petroleum, oils and lubricants and fifteen drums (3,000 L) of aviation fuel will be stored in the POL storage area within the Bulk Liquids Storage Facility. A portable pump will be used for fuel transfer. The POL storage area will be secure, lined and bermed.

The Bulk Liquids Storage Facility will be a secure, fenced area of approximately 800 m<sup>2</sup>.

### **3.1.2 Oily Wastewater**

The facility will provide a minimum of 10,000 L (50 drums) of storage capacity for oily wastewater (OWW) transferred from AOPS vessels and generated at the site from the Bulk Liquids Storage Facility operations and containment berms. OWW drums will be stored in the petroleum, oils and lubricants (POL) storage area within the Bulk Liquids Storage Facility. Oily wastewater will be collected and shipped off-site to an approved location in southern Canada at the end of the summer season for treatment.

Collection sumps for rainwater and melt water will be located in each secondary containment cell in the Bulk Liquids Storage Facility. Water collected in the sumps will be tested, and if necessary, drained through an oil-water separator. OWW will be stored in the POL storage area and uncontaminated water will be released on land to a location approved by Aboriginal Affairs and Northern Development Canada (AANDC), as indicated on the water licence. A portable pump will be used to manage accumulated water.

### **3.1.3 Chemicals and Hazardous Materials**

In addition to the fuels and oily wastewater described previously, there are several other chemicals that are expected to be stored and used at the Nanisivik Naval Facility such as batteries, lubricants, paints etc.

Petroleum, oils and lubricants will be stored in original shipping drums and pails on pallets or metal racks at the Bulk Liquids Storage Facility. The POL storage area within the Bulk Liquids Storage Facility will be approximately 150 m<sup>2</sup> with storage capacity for up to 250 drums of POL, OWW and aviation fuel. A curbed concrete containment area or welded steel drip pans will provide secondary containment.

All other chemicals will be stored in appropriate hazardous material storage containers in the location of their use at the general purpose storage building, which will be located within the fenced boundaries of the Bulk Liquids Storage Facility.

## 4.0 Potential Environmental Effects

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A release of any type of hazardous materials has the potential to bio-accumulate in the environment and cause illness or death to the biological components directly or indirectly via feeding and interaction with environmental media.

Potential discharge events depicted as the worst case scenario are presented in Table 2 for the primary hazardous material stored on-site. A discharge rate for each material is not specified, as the flow would vary greatly depending on the source and puncture.

**Table 2 - Location, Hazardous Material, Potential Discharge Event, and Worst Case Scenario Discharge Volume**

Location	Fuel	Potential Discharge Event	Worst Case Discharge Volume
Bulk Liquids Storage Facility	Naval distillate	1) Over pumping of fuel 2) Overfilling tank 2) Leaking tank 4) Puncture	7.5 million L / 2 vertical tanks
	Diesel		100,000 L / 2 horizontal tanks
	Aviation fuel		3,000 L / 15 drums

Wastewater, petroleum, oils, lubricants and the other materials listed in Section 3.0 could potentially leak. However the quantity would be quite limited and localized, and accordingly the risk from a release impacting the environment would be low.

## **5.0 Mitigation Measures**

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Fuel transfer has the potential to have an environmental effect on water quality.

Fuel transfer to and from vessels at the Wharf, as well as between the Bulk Liquids Storage Facility and the Wharf will be conducted by qualified personnel following standard procedures. The facility design will include appropriate fuel transfer equipment to safely receive fuel from tankers and to refuel naval vessels. All vessels will deploy a spill boom prior to all refuelling operations; the boom will be in place for containment in the unlikely event of a spill. An Environmental Management System will be developed and implemented to avoid accidental releases of petroleum hydrocarbons from the facility. Leak detection systems will be installed on storage tanks and will be monitored to detect leaks. All fuel storage areas will have secondary containment and sumps to collect oily wastewater for treatment. In the event that an accidental release of petroleum hydrocarbons occurs, the facility will have emergency shut-off that can be activated at the Bulk Liquids Storage Facility, at the Wharf and from vessels. An Emergency Response Plan (under separate cover) will be developed and implemented as part of the environmental Management System and Spill Response equipment will be available to contain and clean up the spill, whether it occurs on land or in the marine environment at the Wharf.

Wastewater from sumps during construction and operation can have an adverse environmental effect on water and sediment quality. Prior to discharge, all wastewater will be tested to ensure that it complies with the criteria outlined in the Water Use Licence issued by the Nunavut Water Board.

Leaks or spills from storage of petroleum hydrocarbons and fuel transfer can have an adverse environmental effect on soil quality. Environmental effects of spills and leaks will be avoided or reduced through implementation of an Environmental Management System, monitoring of leak detection systems, secondary containment and sumps to collect oily wastewater for treatment, emergency shut-off systems, an Emergency Response Plan and availability of spill response equipment.

Spill kits will be stored at every location there is fuel, or hazardous materials stored. The type of supplies and quantities will be determined based on the location of the spill kit and volume of material stored.

## **6.0 Action Plan**

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### **6.1 INITIAL ACTIONS**

- Ensure safety of all persons. The most important consideration when responding to a release is ensuring safety of all personnel. All actions must only be undertaken if it can be done in a safe manner.
- Identify hazards and risks. Determine the source and identify the release substance.
- If safely feasible, stop the release (e.g., turn off pump). Utilize the supplies in the spill kit to stop the release. If the released substance is gasoline or aviation fuel, ensure all ignition sources are eliminated and shut off machinery in the vicinity. If contact with the fuel is a risk, Tyvek suits and chemical master gloves from the spill kit must be donned immediately.
- Use deterrent measures (e.g., ATVs, motorboats) to prevent birds and/or wildlife from entering the spill site, if applicable.
- Call for help. The facility manager must be notified regardless of the size of the release. Contact with the manager via two way radio (a radio must be carried by all employees and contractors if they are not accompanied by an employee).
- Contain the spill if safely possible. Utilize the supplies in the spill kit (e.g., place sorbent materials over the released substance). The most effective technique will depend on the situation of the spill.

### **6.2 CONTAINING AND CONTROLLING THE SPILL**

The methods for containing and controlling the spill will vary depending on the situation, media contaminated, weather, etc. The objective of spill containment is to prevent or minimize dispersion. The following is a basic, step-by-step approach to containing and controlling the spill:

#### **General Spill Containment Procedures**

The successful containment of a spill on land or water depends on a variety of factors including: ground cover and topography, hydrogeology, solubility of the material, viscosity of the liquid, water currents, soil permeability and climatic conditions.

The following general guidelines will be followed for containment of spilled materials.

1. Assess the safety hazards of the situation.

2. Remove sources of ignition, if safe to do so.
3. Identify the product, stop source and physically contain spill as soon as safe to do so.
4. Avoid use of water or fire extinguishing chemicals on nonpetroleum product spills unless it is necessary to control a fire or prevent an explosion, since many chemicals react violently with water and chemical extinguishing agents may release toxic fumes. In addition, chemicals may be soluble in water and dispersal makes containment and clean-up more difficult.
5. Minimize traffic on contaminated soils.
6. Use natural depressions or berms constructed with materials and equipment in proximity to the site to physically contain a spill on land. Deployment of booms will be necessary on water.
7. Clean-up will not be attempted without advice from the responsible manager/contractor.

General clean-up steps for specific accidents are outlined below.

#### **Spills Adjacent to or into a Waterbody**

At a minimum, the following general guidelines will be followed for containment and clean-up of most hazardous materials if spilled adjacent to, or into, a waterbody.

1. Construct berm and/or trenches to contain spilled product prior to entry into a waterbody.
2. Deploy booms, skimmers, sorbents, etc., if feasible, to contain and recover spilled material from waterbody. (Note: All vessels will deploy a spill containment boom prior to all refuelling operations).
3. Recover spilled product.
4. Clean-up contaminated area including downstream shorelines.
5. Dispose of heavily contaminated soil and vegetation at an approved facility. On lightly contaminated soil areas where in situ restoration is feasible, fertilize and then cultivate beyond depth of contamination. Repeat as required.

#### **Spills on Snow/Ice**

At a minimum, the following general guidelines will be followed for containment and clean-up of most hazardous materials if spilled onto snow or ice.

1. Once a spill is identified, all sources of ignition should be turned off (e.g., no smoking, shut off engines).

2. The spilled material (e.g., gasoline, diesel, antifreeze, etc.) should be identified, if possible.
3. The affected area should be secured, ensuring the area is safe for entry and does not represent a threat to human health and safety of the spill responders. Public access of the area should be restricted.
4. If possible, identify where the spill is coming from (the source). Determine if the spill is still occurring (i.e., still leaking) or if the spillage has stopped. If the spill has not stopped, determine if it is safe to stop or control the spill (e.g., plug hole, close valve, upright container).
5. If the spill is too large to be controlled with the spill materials at hand, contact the responsible manager/contractor and report the spill, particularly since a spill occurring on snow or ice presents the potential for immediate access of contaminants into waterways.
6. If the spill is small enough to be controlled with the spill response materials at hand, prevent spilled contaminants from spreading or entering waterways by using sorbent materials or a snow/soil dyke down slope from the spill. This is especially the case with liquid contaminants (e.g. gasoline, diesel).
7. If possible with the spill response materials at hand, clean up the remaining spilled contaminant and store contaminated materials in a secure container for disposal. Impacted snow should also be stored in drums for proper disposal.

### **Spot Spills**

Since effects from small spot spills can generally be minimized if appropriate actions are implemented, all small spills of fuels or noxious materials must be reported immediately to the responsible manager/contractor.

At a minimum, the following general guidelines will be followed while cleaning up spot spills of fuel or other hazardous materials.

1. Suspend activity in the immediate vicinity of the spot spill until permission to resume activity has been granted by the responsible manager/contractor.
2. The responsible manager/contractor will determine appropriate methods to remove or restore contaminated soils. Soil and vegetation heavily contaminated with petroleum products will be disposed of at an approved facility.
3. Locations where spot spills occur are to be flagged or otherwise marked to ensure that post-spill monitoring of the site can be undertaken.

4. Lightly contaminated soil areas where restoration is feasible will be fertilized and then cultivated to a depth below the depth of contamination, then repeated as required.

Once the spill has been controlled and further spreading prevented, contact the responsible manager/contractor if not already done so. The responsible manager/contractor is responsible to report the spill to the 24-Hour Emergency Spill Report Line.

### **Birds and Wildlife**

Birds and wildlife must be protected in the event of a spill. If applicable, deterrent measures (e.g., ATVs and motorboats) will be used to prevent birds and/or wildlife from entering the spill site. In the event of a spill affecting birds and/or wildlife, the appropriate authorities will be contacted. Once appropriate permission and direction is obtained, contaminated birds and/or wildlife will be captured and contained; excessive handling will be avoided. Contaminated birds and/or wildlife will be transported to a treatment facility. First aid will be avoided unless directed by the appropriate authorities. If mortalities occur, the appropriate authorities will be contacted prior to disposal.

## **6.3 SPILL REPORTING**

All spills must immediately be reported to the designated manager and/or contractor. As required by Nunavut, they will be responsible for reporting the spill to the Nunavut 24-Hour Spill Report Line at 867-920-8130.

The Nunavut Spill Report form must be completed (Attachment A) and is available in every spill kit, as well, the designated manager and/or contractor will have copies. The completed form must be submitted via email or fax to the Nunavut 24-Hour Spill Report Line. The report should also be submitted to DND via fax or email and kept on record.

It is required of any person reporting a spill to disclose as much information as possible regarding the incident. All knowledge regarding the spill should be described in the initial spill report. Note that reporting the spill should not be delayed due to lack of information, as further information may be provided later. Important items to document and report regarding the spill include:

- Occurrence date and time
- Geographic place
- Product spilled
- Quantity of product spilled
- Source and cause of the spill
- The status of the spill (i.e., continuing or stopped)
- Area of contamination
- Factors affecting the spill or recovery
- Hazards to person, property or environment
- Action taken, and assistance required



#### **6.4 TRANSFERRING, STORING, AND MANAGING SPILL-RELATED WASTE**

Following spill containment and reporting, the released substance must be recovered and disposed of in an appropriate manner. Generally, clean up begins at the edge of the spill and then moves inward. For smaller spills, sorbent materials and hand tools (cans, shovels, and rakes) are used, whereas for larger releases on land or ice, a pump with a hose attached to a drum is utilized.

Along with the released substance, contaminated objects such as environmental media, material used for the construction of dykes or weirs, and absorbent materials must be recovered and disposed of properly. Tools and sorbent materials used in the containment of petroleum must be sealed in waste oil containers and disposed of via approved disposal methods. Tools from the spill kits must be cleaned, decontaminated and returned or replaced back to the spill kit. Spill kits must be resupplied.

#### **6.5 RESTORING AFFECTED AREAS**

In consultation with Nunavut Department of Environment and DND, an appropriate reclamation plan will be determined. A site specific study may be necessary in order to ensure a safe level of decontamination is attained. Remediation may include contouring, replacement of soil, and revegetation.

## 7.0 Emergency Contacts

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The list of emergency contacts will be updated by the construction contractor to provide emergency contact information during construction of the Nanisivik Naval Facility.

Nunavut 24-Hour Spill Report Line	Phone: 867-920-8130 Fax: 867-873-6924 Email: <a href="mailto:spills@govt.nt.ca">spills@govt.nt.ca</a>
Nunavut Emergency Management 24-Hour Line	1-800-693-1666
Canadian Coast Guard Marine Spill Report 24-Hour Line	1-800-265-0237
Environment Canada 24-Hour Line	867-920-8130
Department of Fisheries and Oceans	867-979-6274
Site Medic	TBD
Site Manager	TBD
Environmental Coordinator	TBD
DND – Rodney Watson, Project Manager (during construction)	613-943-8277 RODNEY.WATSON@forces.gc.ca
MARLANT – Maritime Forces Atlantic, CFB Halifax (during operation)	TBD

## **8.0 Training**

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All employees and contractors working on-site for any phase of the Project must be familiar with the Spill Contingency Plan. Knowledge of the Plan will be required through a mandatory orientation session which will specify locations of spill kits and spill contingency action plans, contents of spill kits, Material Safety Data Sheets and education on completing the Nunavut Spill Report form. Training will include mock spill exercises, specific training to individuals that handle hazardous materials and on appropriate use of the spill kits.

Additional training such as First Aid and WHMIS will be required of all employees and contractors working on-site. Supervisors must have completed advanced level first aid training and transport of dangerous goods training.

The camp manager will have a record of all employees training dates, levels and expiration dates. Annual refreshers regarding this Spill Contingency Plan will be conducted following the mandatory orientation.

## **9.0 References**

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Indian and Northern Affairs Canada (INAC). 2007. Guidelines for Spill Contingency Planning. Yellowknife, NT: Water Resources Division, INAC, 2007. Retrieved August 2011: [www.ainc-inac.gc.ca](http://www.ainc-inac.gc.ca)

Nunavut Department of Environment. No Date. Contingency Planning and Spill Reporting in Nunavut: A Guide to the New Regulations. Retrieved August 2011: [www.env.gov.nu.ca](http://www.env.gov.nu.ca).

# **Attachment A**

**Nunavut Spill Report Form**



# NT-NU SPILL REPORT

NT-NU 24-HOUR SPILL REPORT LINE

FAX: (867) 873-6924

EMAIL: [spills@gov.nt.ca](mailto:spills@gov.nt.ca)

REPORT LINE USE ONLY

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