NORTHWEST TERRITORIES POWER CORPORATION

Empowering Communities

SPILL CONTINGENCY PLAN

BLUEFISH HYDROELECTRIC FACILITY
PLANT #122
BLUEFISH LAKE, NORTHWEST TERRITORIES

Issue Date: June 2020

Spill Contingency Plan Maintenance and Control

The Director, Health, Safety & Environment is responsible for the distribution, maintenance and updating of the Spill Contingency Plan. This Spill Contingency Plan will be updated:

i. Annually, considering changes in the law, environmental factors, NTPC policies, and Facility characteristics; and/or
ii. Following a major spill incident.

Changes in phone numbers, names of individuals, etc. that do not affect the intent of the plan are to be made on a regular basis. Plan updates will be issued as per the Spill Contingency Plan distribution list. The Spill Contingency Plan holder is responsible for adding new and/or removing obsolete pages upon receipt of updates.

DOCUMENT HISTORY				
Revision #	**Revised Section(s)**	**Description of Revision**	**Prepared by**	**Issue Date**
01	Entire document	Reviewed and modified for legislative changes and for the construction project of new dam.	Golder Associates Ltd.	September, 2010
02	Section 2.3	Added definition on acronyms shown on Figure 2-3	Golder Associates Ltd.	November 2010
03	Entire document	Incorporated final comments in preparation for final submission.	NTPC	March, 2011
04	Section 3.2 and Table 3.1	Table 3.1 changed to require reporting of all fuel spills, regardless of quantity. Section 3.2 updated to implement Emergency Preparedness Plan for spills to Prosperous Lake. Updated site layout map (Figure 1)	Golder Associates Ltd.	August, 2011
05	Section 2.2	Reference to Appendix – H added to provide additional information on sensitive environmental receptors	NTPC	August, 2011
06	Sections 1.1, 1.6.6, and 4.4	Contact information updates and responsibility clarification	NTPC	February, 2013

DOCUMENT HISTORY				
07	All	Reviewed and updated	NTPC	June, 2015
08	All	Reviewed w/ Operations and updated	NTPC	August, 2016
09	All	Reviewed and updated	NTPC	June, 2017
10	All	Reviewed w/ Operations and updated	NTPC	July, 2018
11	All	Reviewed/ updated	NTPC	June, 2020

TABLE OF CONTENTS

SECTION **PAGE**

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

The Northwest Territories Power Corporation (NTPC) has prepared this Spill Contingency Plan (SCP) for the Bluefish Hydroelectric Facility (the Facility) located on the north shore of Prosperous Lake, Northwest Territories.

Bluefish Hydro (62° 42'N and 114° 15'W) is a remote hydroelectric power generating facility located 39 km north of Yellowknife on the north end of Prosperous Lake where the Yellowknife River enters Prosperous Lake from Bluefish Lake. The nearest community is Yellowknife. The Bluefish facility holds a Type A Water License (MV2005L4-0008) and Type A Land Use Permit (MV2017X0005).

The SCP demonstrates that NTPC has appropriate response capabilities and measures in place to effectively address potential spills at the Bluefish Hydroelectric Facility.

1.1 COMPANY INFORMATION

Contact information for the Facility owner is as follows:

Northwest Territories Power Corporation
4 Capital Drive, Hay River, Northwest Territories X0E 1G2
Phone: 874-5200; Fax: 874-5251

Facility Mailing Address: Box 2250, Yellowknife, Northwest Territories X1A 2P7
Facility Main Contact: Stuart Robinson, Interim Manager, Hydro Plant Operations
Phone: (867) 669-3328; Fax: (867) 669-3316
Email: stuartrobinson@ntpc.com

1.2 PURPOSE

The purpose of this SCP is to outline response actions for potential spills of hazardous materials of any quantity, including a worst-case scenario, at the Facility. The plan identifies key response personnel and their roles and responsibilities in the event of a spill, as well as the equipment and other resources available to respond to a spill. It details the spill response procedures that will minimize potential health and safety hazards, environmental damage, and clean-up efforts. The plan has been prepared to ensure quick access to all the information required in responding to a spill. More specifically, the purpose is:

- to comply with NTPC's Environmental Protection Policy (see Section 1.4);

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

This SCP has been prepared in general accordance with the following reference documents:

- Government of Northwest Territories. 1993. Spill Contingency Planning and Reporting Regulations R-068-93. Yellowknife, N.W.T: Author.
- Government of Northwest Territories. January 2002. Guide to the Spill Contingency Planning and Reporting Regulations. Resources, Wildlife & Economic Development. (Updated March 2011)
- Indian and Northern Affairs Canada (INAC). 2007. Guidelines for Spill Contingency Planning. Yellowknife, N.W.T: Water Resources Division of INAC.
- Government of Northwest Territories. 1993. Northwest Territories Waters Regulations SOR/93-303. Yellowknife, N.W.T: Author. Note that the *Northwest Territories Devolution Act* repealed the *Northwest Territories Waters Act,* reflecting its provisions in the amended *Mackenzie Valley Resource Management Act*. The *Northwest Territories Devolution Act* transferred the Northwest Territories Waters Regulations under the authority of the *Mackenzie Valley Resource Management Act*, and deemed the regulations to remain in force until they are repealed or replaced.
- Canadian Council of Ministers of the Environment (CCME). 2003. Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products. Winnipeg, Manitoba: Author.

1.3 SCOPE

This SCP applies to the accidental and/or uncontrolled release of a contaminant into the environment that has the potential for adverse impact. The SCP applies to all casual, permanent, part-time, full-time employees, and contractors who conduct work or provide services at the Facility. This SCP covers activities and operations conducted at the Facility.

1.4 ENVIRONMENTAL POLICY AND PROCEDURES

Policy

NTPC is committed to protecting the environment for existing and future generations by meeting, if not exceeding, environmental regulations. Our environmental principles are based on the fundamental values of responsibility, accountability, and open communication. We will strive for continuous improvement in environmental performance and will manage our operations in an environmentally responsible manner.

NTPC will:

- Comply with all applicable environmental legislation and guidelines;
- Maintain an Environmental Management System;
- Incorporate environmental planning in the design phase of projects;
- Reduce waste and use resources as efficiently as possible;
- Take reasonable measures to prevent and reduce pollution to air, water, and soil;
- Manage hazardous waste in a manner that minimizes risk to the environment;
- Report all hazardous materials spills released to water, regardless of size;
- Report all hazardous materials spills greater than 5 L to ground or floor;
- Policy Review Date: 30/06/2020
- Clean up all hazardous materials spills to meet applicable environmental criteria;
- Promote the efficient use of energy to customers;
- Provide employees with the appropriate training and education to help them fulfill their environmental responsibilities;
- Communicate regularly with indigenous groups, government, regulators, industry, community groups, and the public regarding NTPC activities; and
- Respect the heritages of the people and communities that we serve.

NTPC handles several hazardous substances at its power generation facilities and has a responsibility to protect and conserve the environment. Prevention of spills is important for the protection of the health and safety of employees, the community, and the environment. Therefore, operating procedures are regularly updated, and personnel trained to ensure safe and environmentally sound operations. This SCP will form a component of the Facility's Environmental Management System (EMS). As such, it is a working document that will be reviewed and updated on a regular basis. At a minimum the SCP will be reviewed and updated annually. Training is provided on the following NTPC policies, procedures, and information sources, which are available at the Facility and/or on the NTPC Intranet PowerLine:

- Spill Contingency Plan
- Hazardous Waste Management Plan
- Waste Management Plan
- Fuel Transfer Procedures

- Berm Dewatering SWP
- Safety Handbook

The SCP is presented to all employees and contractors during their on-site orientation sessions. All employees and contractors who work with hazardous materials onsite are made aware of the locations of the SCP at the facility and are made aware of the locations where spill kits are stored, and their individual responsibilities to respond to spills. NTPC is committed to keeping personnel up to date on the latest technologies and spill response methods. Training records are documented and maintained.

1.5 SAFETY DATA SHEETS

In the event of a hazardous materials spill, all responders and/or affected parties must be aware of the hazards and properties associated with the spilled product(s). NTPC maintains Safety Data Sheets (SDS) for all controlled products used, stored, and/or handled at NTPC work sites. SDS are maintained up-to-date and are located in binders at each plant, mechanics garage, and office.

The Corporation's SDS are also available online at **http://3eonline.com**

User name: ntpc

Password: msds

This login information is also available on the NTPC Intranet PowerLine (the PowerLine) under Departments/Environment/Hazardous Waste Management Plan.

1.6 GENERAL RESPONSIBILITIES

1.6.1 General

- No person should handle a substance unless that person is familiar with the hazards.
- No person should use a substance unless that person is familiar with the proper use.

1.6.2 Contractors and Subcontractors

- Know the location of the SCP, spill response materials, first aid stations, emergency and safety equipment, Safety Data Sheets (SDS), emergency exits, and muster stations.
- Wear appropriate personal protective equipment (PPE).
- Know basic spill prevention requirements.
- Know the spill reporting procedures.
- Report all emergencies and spills to the Plant Operator.
- Comply with all NTPC and Facility policies and procedures when performing duties.

1.6.3 Onsite NTPC Employees

- Ensure worksite and personnel safety.
- Know the location of the SCP, spill response materials, first aid stations, emergency and safety equipment, Safety Data Sheets (SDS), emergency exits, and muster stations.
- Wear appropriate personal protective equipment (PPE).
- Know basic spill prevention requirements.
- Know the spill reporting procedures.
- Report all emergencies and spills to the Plant Operator.
- Comply with all NTPC and Facility policies and procedures when performing duties.

1.6.4 Plant Operator / On-Scene Coordinator

The Plant Operator has knowledge of the specific procedures that must be followed to work with and/or near hazardous materials in a safe and secure manner. The Plant Operator is the NTPC On-Scene Coordinator and is responsible for:

- ensuring the safety of all personnel and the site;
- ensuring all new site personnel and contractors are oriented and have access to all the required documentation;
- ensuring all NTPC employees and contractors adhere to the requirements of the SCP;
- acting as the On-Scene Coordinator in responding to spills;
- activating and coordinate the SCP and any other required contingency plans in the case of an emergency or spills involving hazardous materials or wastes and direct any cleanup activity until completion or until authority is passed to other personnel;
- notifying NTPC management and local contractors as required;
- reporting the spill to the NWT 24-HOUR SPILL REPORT LINE;
- assisting in developing and implementing spill response training programs and exercises; and

1.6.5 Manager, Operations

- Ensure that the response initiated at the Facility by the Plant Operator is immediate, effective and sustained.

1.6.6 Director, Health, Safety & Environment

- Maintain and complete the annual review of the SCP.
- Ensure that all SCP documentation remains up-to-date and the updated versions are distributed out to the personnel on site, external agencies and organizations. A formal record is kept of all distribution and amendments.

- Liaise with the Plant Operator and/or Manager, Operations and the appropriate environmental regulatory body to ensure that the response to a spill at the Facility is completed in accordance with existing environmental laws and regulations.
- In coordination with the Plant Operator, prepare and submit any formal reports (within the required time frame) to regulators and NTPC management regarding the management of hazardous materials and spill response.

1.6.7 Third Party Contractors and Suppliers

- Ensure worksite and personnel safety.
- Know the location of the SCP, spill response materials, first aid stations, emergency and safety equipment, Safety Data Sheets (SDS), emergency exits, and muster stations.
- Wear appropriate personal protective equipment (PPE).
- Know basic spill prevention requirements.
- Know the spill reporting procedures.
- Report all emergencies and spills to their supervisor and/or the Plant Operator.
- Comply with all NTPC and Facility policies and procedures when performing duties.

1.7 DISTRIBUTION LIST

The SCP and the most recent revisions are distributed internally to:

i. Environmental Health and Safety Department, Bluefish Hydroelectric Facility/NTPC (control copy)
ii. Manager, Operations and Maintenance, Bluefish Hydroelectric Facility
iii. Plant Operator, Bluefish Hydroelectric Facility
iv. Manager, System Control, Hydro Region
v. Central Control Room, NTPC
vi. Manager, Communications, NTPC
vii. NTPC Intranet PowerLine

Environmental Health and Safety Department is responsible for distribution of the SCP to outside third-party stakeholders, including:

- Environment and Natural Resources (ENR)
- Mackenzie Valley Land and Water Board (MVLWB)
- Third-party responders

2 BLUEFISH HYDROELECTRIC FACILITY

2.1 FACILITY SETTING

Bluefish Hydro (62° 42'N and 114° 15'W) is a remote hydroelectric power generating facility located 39 km north of Yellowknife on the north end of Prosperous Lake where the Yellowknife River enters Prosperous Lake from Bluefish Lake. The nearest community is Yellowknife.

The Facility is located in a remote area, with no road access nor adjacent communities or inhabitants. Thus, the only people immediately affected by a potential spill are the employees and contractors working at the Facility. Personnel and some freight are delivered to the Facility by helicopter in the winter and boat in the summer. During the winter an ice road is constructed across Prosperous Lake connecting the Facility to NWT Highway #4. The winter road allows for fuel, oversized equipment, and freight to be delivered to site.

2.2 SITE DESCRIPTION

The Bluefish Lake Hydroelectric Facility is a remote power generating facility consisting of two dams, a head gate, penstock, and two power plants that house hydro electric generators. The Facility was originally constructed in the 1940s and operates all year round.

Duncan Lake, the main storage lake for the reservoir system is upstream of the Bluefish Lake on the Duncan River System. The Duncan Lake control dam is situated at the outlet of the Duncan Lake. Water flows from Duncan Lake through the McCrea River to Neck Lake, Short Point Lake, Angle Lake, Quyta Lake where the McCrea River and Yellowknife River systems join to Bluefish Lake

The Bluefish dam is situated at the outlet of Bluefish Lake, upstream of Prosperous Lake on the Yellowknife River (see Figure 2-1). There is a control gate on Bluefish Lake and a penstock leads from Bluefish Lake to the two hydro power plants (3.5 MW and 4.0 MW) located on the north shore of Prosperous Lake. The spillway runs from the Bluefish Dam to Prosperous Lake west of the facility.

The Facility layout including the locations of the generators, main buildings, bunkhouse, key facility infrastructure, construction operations infrastructure, waste incinerator, septic system, gray water system, sewage treatment plant, fuel storage areas and surrounding water bodies are shown on Figure 2-1.

The Facility is surrounded with a chain-link fence with access through a vehicle gate located on the southwest corner of the lot near the dock, a vehicle gate on the north end of the site leading to the communications tower, a vehicle gate located next to the substation, and a man gate in the

southeast corner of the site next to plant G1. Two power plants sit on the south end of the site on the shore of Prosperous Lake (see Figure 2-1).

Two crew trailers sit on the east side of the lot with a transient house, an open storage shed, and a fuel storage area in the northeast corner. A garage and drum storage platform sit on the north side of the lot. A small oil storage shed sits to the east of the garage. A communications tower and shed sit north of the site. On the east side of the lot sits a substation, and east of that a helipad.

The penstock runs south from Bluefish Lake through the center of the lot and carries water to the two powerhouses. A surge house building is positioned north of the Facility on the penstock.

Figure 2-1: Bluefish Lake Hydroelectric Facility Location

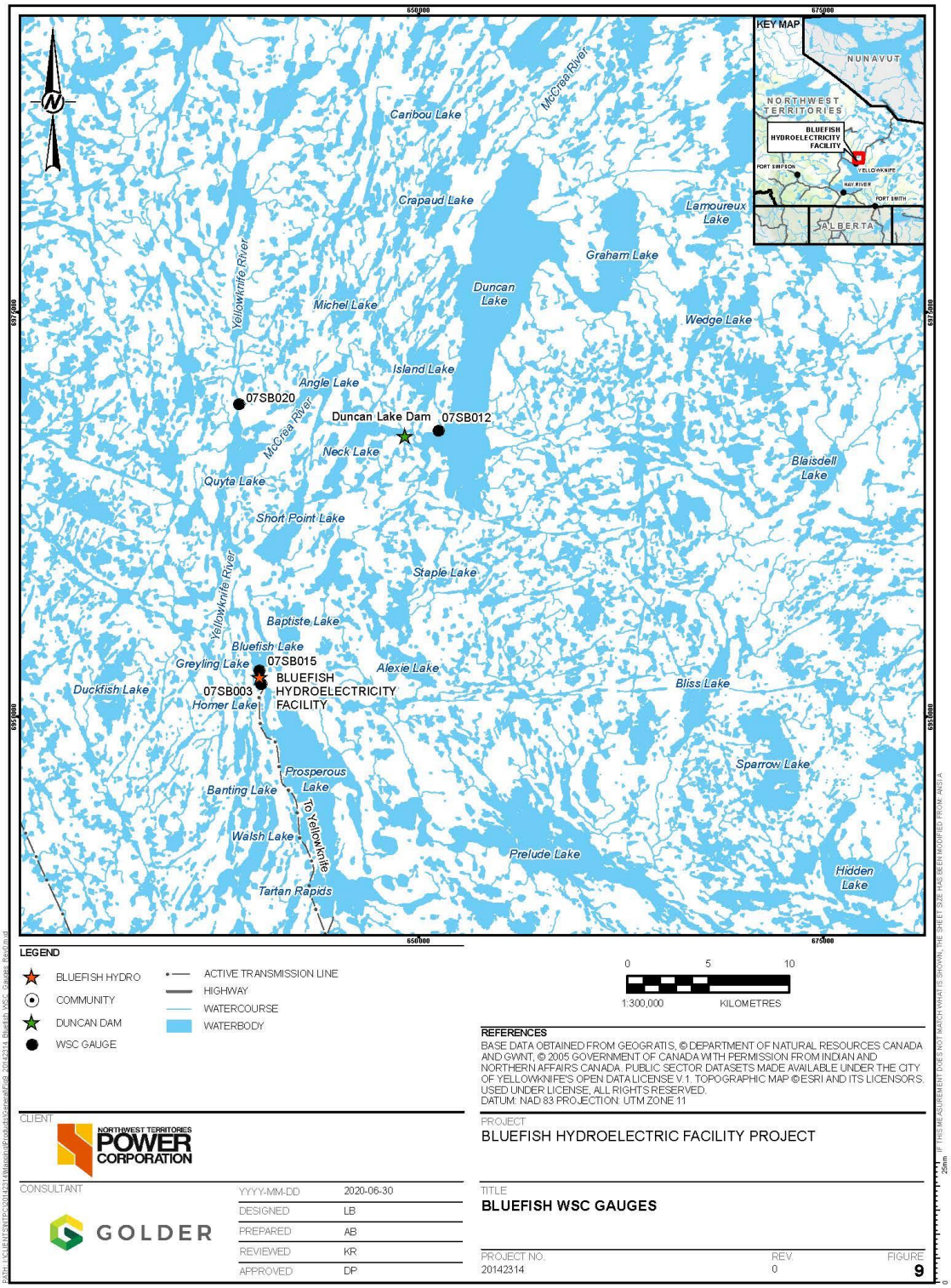
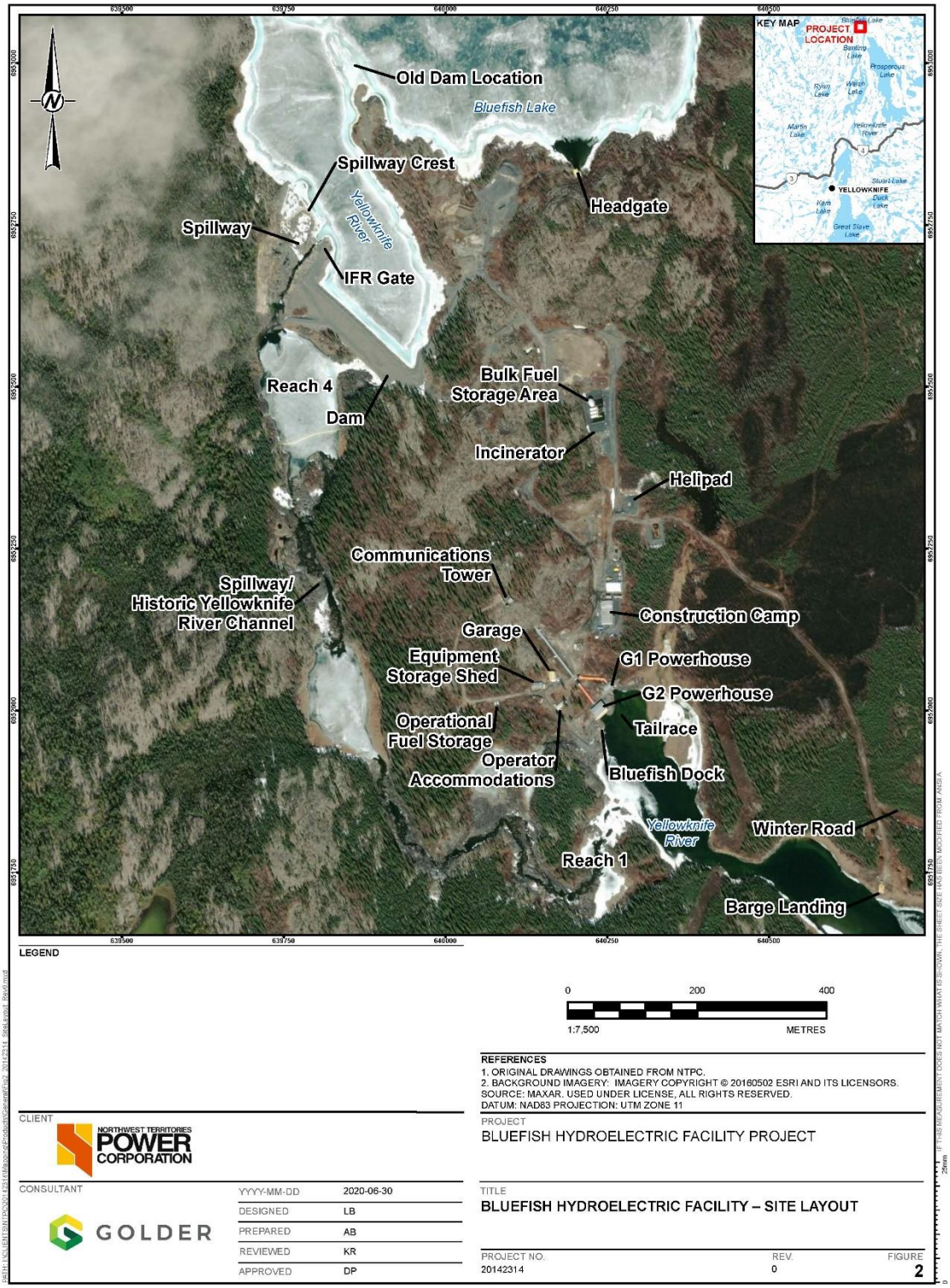


Figure 2-2: Location of Main Hazardous Materials Storage at the Facility



Sensitive Environmental Receptors

The two power plants sit on the north shore of Prosperous Lake. Fuel storage is approximately 60 m north of the spillway and 160 m northwest of the lake. The primary objective of the spill response is to stop spilled product from reaching the spillway and Prosperous Lake. For more information on sensitive environmental receptors see Appendix – H for an excerpt from the *Bluefish Hydro Dam Replacement Project – Terrestrial Environment and Project Effects Scoping Document*.

2.3 LOCATION AND LIST OF HAZARDOUS MATERIALS ON-SITE

The main hazardous materials storage areas include the following: (The code in brackets refers Fuel Storage, Hazardous Materials, and Hazardous Waste storage areas, indicated in Figure 2-2.)

- The Facility's Camp Tank Farm (FS-1 on Figure 2-2);
- The Construction Tank Farm (HM/HW-3);
- The Drum Storage Platform (HW-1);
- The Oil Storage Shed (HM-1);
- The construction storage tent and sea-can (located just north of the water treatment plant but not shown on Figure 2-2) and
- The Material Storage Building (HM/HW-2).

Figure 2-2 identifies the locations of the main hazardous materials storage areas at the Facility as listed above. The locations of speciality spill response material and equipment storage areas are shown on Figure 2-2.

The Facility's Tank Farm includes two 10,000 L double-walled above ground storage tanks (ASTs); one for diesel fuel and one for gasoline. Fuel is used to supply equipment and vehicles. The storage compound is fenced. The tank farm is located approximately 50 m outside and to the west of the fenced portion of the Facility. This tank farm is approximately 60 m north of the spillway and 160 m northwest of the Prosperous Lake. Drip trays are used when transferring fuel to or from the Camp Tank Farm.

The dam's Bulk Fuel Storage Area is located approximately 100 m north of the helipad, and 500 m north of Generator 1. The Bulk Fuel Storage Area includes three 100,000 L double-walled ASTs and one 450,000 L single-walled AST all containing diesel. All four of the ASTs are located within bermed secondary containment constructed with engineered synthetic liner and capacity 700 m^3. The AST were used to supply fuel in association with construction activities for the dam. Now that the new dam is completed, the ASTs will be kept for potential future projects. The vehicle fill area is provided with spill containment. A mobile 2,000 L double-walled diesel AST will

be filled in the Bulk Fuel Storage Area and used for fuel transfers around site. Drip trays will be used when transferring fuel from the mobile AST.

Next to fuel, lube oil and glycol are the two most abundant hazardous goods stored at the Facility. The Oil Storage Shed is used for storing new oil and glycol 20 L containers jugs. The Drum Storage Platform is used for storing waste oil and waste glycol in 205 L drums. Other hazardous materials present on-site include small quantities contained in 205 L drums, 20 L pails, or on pallets in the Materials Storage Building or the generation station plant. The hazardous materials include paint, solvents, lubricants, oil, grease for maintenance of equipment and general cleaning products for kitchen, bathroom and office use. In addition, each of the transformers at the power substation contains 9,100 L of transformer oil.

Table 2-2 presents an estimated list of hazardous materials on-site, the type of container, the average quantities normally stored, the maximum quantity, the storage location and the material use.

Table 2-1: List of Main Hazardous Materials On-Site

Material	Storage Container	Normally On-Site	Maximum On-Site	Storage Location (see Figure 2-2) and Uses
Diesel	450,000 L single-walled AST	0 L (1 AST)	450,000 L (1 AST)	Bulk Fuel Storage Area - located 100 m north of the helipad. Filled during large construction projects.
	100,000 L double-walled above ground storage tank (AST)	0 L (3 AST's)	300,000 L (3 AST's)	Bulk Fuel Storage Area - located 100 m north of the helipad. Filled during large construction projects.
	10,000 L double-walled AST	10,000 L (1 AST)	10,000 L (1 AST)	Operational Fuel Storage – located in a fenced compound located 50 m west of the main Facility. Used for fuel Facility equipment and vehicles.
	2,000 L double-walled AST	2,000 L (1 AST)	2,000 L (1 AST)	Near Construction Tank Farm. Used for fuel transfers.
	200 L tidy tank	200 L (1 tidy tank)	200 L (1 tidy tank)	Facility Tank Farm. Used to transport fuel around camp.
	950 L day tank	950 L (1 day tank)	950 L (1 day tank)	G3 day tank
Gasoline	10,000 L double-walled AST	10,000 L (1 AST)	10,000 L (1 AST)	Camp Tank Farm – located in a fenced compound located 50 m west of the main Facility. Used for fuelling Facility equipment and vehicles.
	200 L tidy tank	200 L (1 tidy tank)	200 L (1 tidy tank)	Camp Tank Farm. Used to transport fuel around camp.
Governor Oil	380 L (G1 accumulator tank)	380 L (1 tank)	380 L (1 tank)	Accumulator tank in G1 Plant.
	1,325 L (G2 accumulator tank)	1,325 L (1 tank)	1,325 L (1 tank)	Accumulator tank in G2 Plant.
Jet Fuel	0	0	0	There is no fuel storage area located on site; it is brought in/out by helicopter. Used for helicopters.
Lubricating Oil	20 L pail	80 L (4 pails)	80 L (4 pails)	Oil Storage Building and the construction tent and heated sea-can. Used for general storage and transfer to smaller containers (1 L bottles).
Glycol	205 L drum	205 L (1 drum)	205 L (1 drum)	New product stored in the Oil Storage Shed, waste product on the Drum Storage Platform, and the Construction tent and heated sea-can. Used for vehicle and equipment antifreeze.

Table 2-2: List of Main Hazardous Materials On-Site (continued)

Material	Storage Container	Normally On-Site	Maximum On-Site	Storage Location (see Figure 2-2) and Uses
Propane	1,000 L tank	2,000 L (2 tanks)	2,000 L (2 tanks)	Near camp and the Cold Storage Building. Used for kitchen stove, barbeque and fridge.
Acetylene	80 lb tank	80 lb (1 tank)	160 lb (2 tanks)	Material Storage Building. Used for welding.
Oxygen	100 lb tank	100 lb (1 tank)	200 lb (2 tanks)	Material Storage Building. Used for welding.
Transformer Oil	9,100 L Transformer	18,200 L (2 Transformers)	18,200 L (2 Transformers)	Substation
	1,100 L (1 Transformer)	1,100 L (1 Transformer)	1,100 L (1 Transformer)	Camp Pad Mount
	760 L (1 Trans-former)	760 L (1 Transformer)	1,100 L (1 Transformer)	Camp Pad Mount
Sewage	Underground concrete tank	<200 L	200 L	Next to Operator's trailer

3 SPILLS

3.1 WHAT IS A SPILL?

For the purposes of this SCP, a spill is defined as an accidental release of a contaminant into the environment that has the potential for adverse impact.

3.2 MATERIALS & REPORTABLE SPILLS ON SITE

According to the NWT Spill Contingency Planning and Reporting Regulations, where there is a reasonable likelihood of a spill in an amount equal to or greater than the amounts set out in Table 3-1, the spill must be reported to the NWT 24-HOUR SPILL REPORT LINE at 867-920-8130.

The Plant Operator, or their designate, is responsible for reporting spills at the Facility. The Plant Operator must be notified immediately of any spill, regardless of quantity to land or water.

In addition, all releases of harmful substances are to be reported to the NWT 24-HOUR SPILL REPORT LINE if the release exceeds that of the NWT SCPR regulations (see Table 3-1) or is into a water body (including frozen).

As a precaution, if there is any doubt as to whether the quantity spilled meets the minimum reportable thresholds listed in Table 2, the spill incident shall be reported to the NWT 24-HOUR SPILL REPORT LINE.

The Facility maintains a detailed log of all spills of hazardous materials, including non-reportable spills. As part of Facility's overall environmental management system, procedures will be implemented to encourage all site workers to communicate non-reportable spill incidents to the Plant Operator.

If there is a spill of any substance into a waterbody or watercourse which may affect or endanger users of Prosperous Lake, the Emergency Preparedness Plan should be implemented.

Table 3-1: Immediately Reportable Quantities

Transportation Class	Description of Contaminant	Amount Spilled
1	Explosives	any amount
2.1	compressed gas (flammable)	any amount of gas from containers with a capacity greater than 100 L
2.2	compressed gas (non-corrosive, non-flammable)	any amount of gas from containers with a capacity greater than 100 L
2.3	compressed gas (toxic)	any amount
2.4	compressed gas (corrosive)	any amount
3.1, 3.2, 3.3	flammable liquid	≥100 L
3.1, 3.2, 3.3	flammable liquid or vehicle fluid	when released on a frozen water body that is being used as a working surface ≥ 20L
4.1	flammable solid	≥ 25 kg
4.2	spontaneously combustible solids	≥ 25 kg
4.3	water reactant solids	≥ 25 kg
5.1	oxidizing substances	≥ 50 L of 50 kg
5.2	organic peroxides	≥ 1 L or 1 kg
6.1	toxic substances	≥ 5 L or 5 kg
6.2	infectious substances	any amount
7	radioactive substances	any amount
8	corrosive substances	≥ 5 L or 5 kg
9.1 (in part)	Miscellaneous products, substances or organisms	≥ 5 L or 5 kg
9.2	environmentally hazardous	≥ 1 L or 1 kg
9.1 (in part)	PCB mixtures of 5 ppm or more	0.5 L or 0.5 kg
None	other contaminants	≥ 100 L or 100 kg
	Sewage and Wastewater	any amount
	Sour natural gas (H2S), sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more
	Unknown Substance	any amount

Notes: L = litre; kg = kilogram; PCB = polychlorinated biphenyls; ppm = parts per million.

3.3 SPILL PREVENTION MEASURES

The first step in hazardous materials spill response is to take steps to prevent the spill from occurring. Planning for an emergency situation is imperative, due to the nature of the materials stored on site as well as the remoteness of the site. Along with the preventative measures outlined below, adequate training of staff and contractors is paramount.

The following general preventative measures are in place to minimize the risk and impact of a potential spill or release:

- Prior to starting work at the Facility, all employees and contractors who work with hazardous materials are required, as a minimum, to go through an orientation session to familiarize themselves with this SCP, the hazardous materials present at the Facility and the Facility spill response procedures.
- All site staff are trained on the safe handling, transfers and dispensing of fuels at the facility. Safe practices include, but are not limited to, required personal protective equipment, constant attendance during fuelling operations, only fuelling when spill kits are available nearby, and awareness of location of pump shut-offs and emergency shut-offs. Records of training are maintained.
- The main fuel and hazardous materials storage and dispensing areas are located more than 100 metres from Prosperous Lake; and/or are stored indoors where spills are not likely to exit from the storage building. Boat refueling is conducted near the lake shore. The tidy tank is transferred to the boat dock and returned to the camp tank farm after use.
- No hazardous materials shall be stored on the surface ice of Prosperous Lake. All fuel and hazardous materials caches are located above the high-water mark of Prosperous Lake.
- Spill kits are provided wherever fuel is stored, used and transferred. The spill kits and their contents are regularly inspected to ensure that adequate supplies are available.
- Fuel and chemical storage areas are provided with secondary containment.
- The Plant Operator conducts daily visual inspections of the facility to check for leaks or damage to the fuel storage containers, as well as for stained or discoloured soils around the fuel and chemical storage areas. Storage areas are kept clear of snow and debris.

NTPC also supports the following general principles for spill prevention:

- Train workers in the use of safe work procedures for hazardous materials, and procedures to clean up spills.
- Encourage workers to take reasonable measures to prevent spills.
- Provide access to up to date Safety Data Sheets (SDSs) for all hazardous materials.
- Conduct inspections of fuel/chemical storage areas.
- Keep drums/containers sealed or closed, except when removing or adding contents.
- Avoid overfilling drums/containers.
- Place drums/containers within a suitable form of secondary or spill containment.

- Keep storage areas secure from unauthorized access.
- Segregate incompatible materials.
- Ensure storage areas are adequately protected from weather and physical damage.
- Provide adequate spill response materials at storage areas.
- Develop and implement good environmental work practises such as the use of oil drip trays and absorbents for servicing vehicles.
- Regularly inspect, clean and maintain machinery which may operate near or perhaps in water.
- Regularly inspect storage areas.

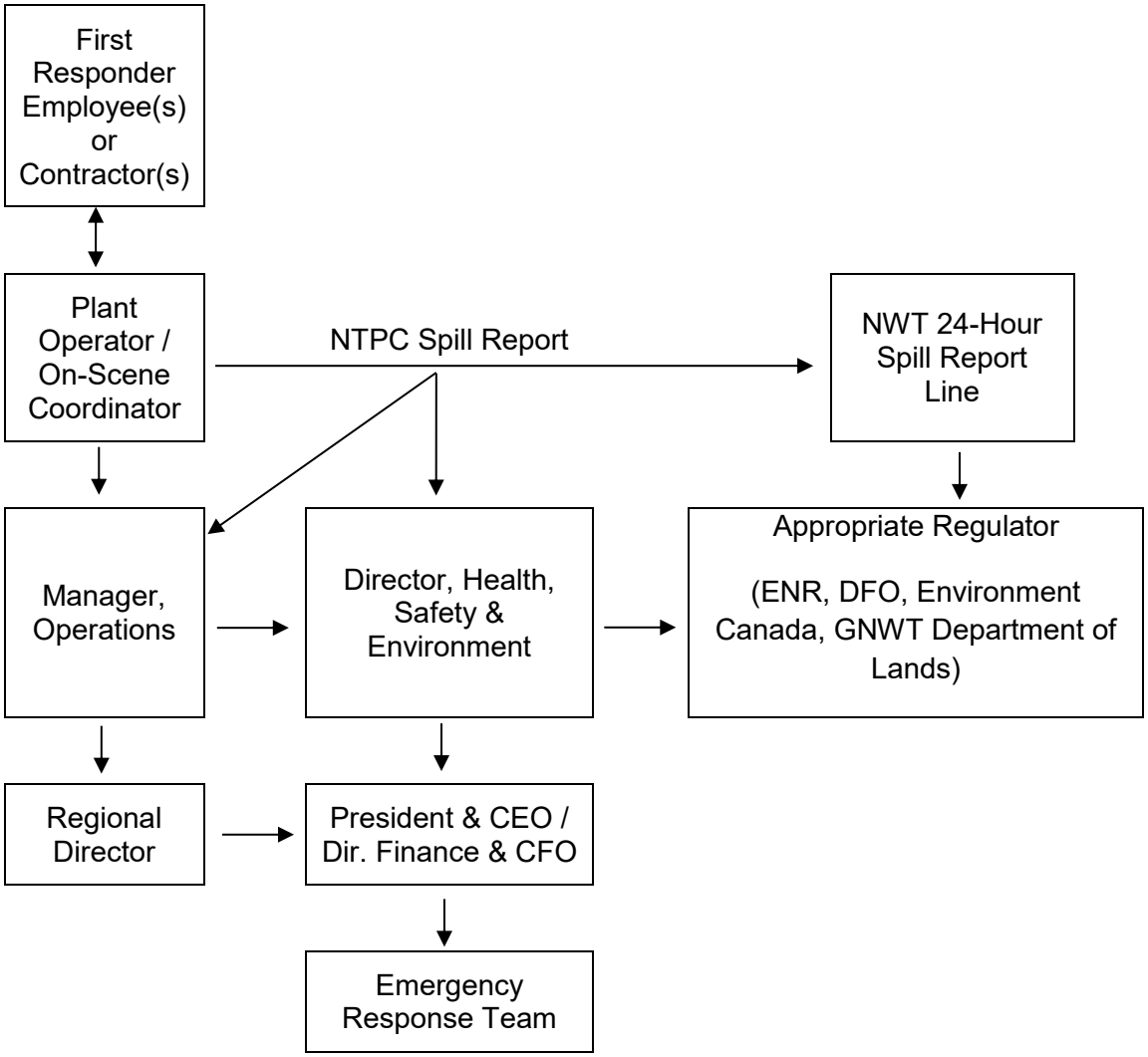
4 RESPONSE ORGANIZATION

4.1 RESPONSE ORGANIZATION

The flowchart depicted in Figure 4-1 identifies the response organization and the chain of command for responding to a spill. In accordance with the action plan described in Section 5, the response organization details the roles and responsibilities of each party involved in the spill and their contact information, including the 24-hr phone numbers for the responsible personnel. Note that post Devolution (as of April 1, 2014), the Government of the Northwest Territories (GNWT) department of Environment and Natural Resources (ENR) has taken over the duties of Indian and Northern Affairs Canada (INAC) Inspectors for issued water licenses. ENR's North Slave region is responsible for spills under NTCP's water license.

All employees and contractors are to carry two-way radios for communication on site, with a repeater tower to allow for communication with Yellowknife. In the event of a spill involving danger to human life these phones will be used to contact emergency response personnel in Yellowknife.

Figure 4-1: Spill Response Organizational Communication Flowchart



4.2 RESPONSE TEAM ROLES AND RESPONSIBILITIES

4.2.1 First Responder

The person who has caused a spill or is the first to observe the spill is the first responder. This includes NTPC employees and contractors working at the Facility. The roles and responsibilities of the first responder are as follows:

- to ensure site and personnel safety
- to assess the preliminary severity and source of the spill
- to identify and contain the spill, if it is safe to do so
- to immediately report to and work with the Plant Operator (On-Scene Coordinator)

- contractor employees are to report through their Supervisors, who in turn are required to report to the On-Scene Coordinator; and
- to participate in spill response as a member of the clean-up crew if requested by the Plant Operator

4.2.2 On-Scene Coordinator / Plant Operator

The On-Scene Coordinator must be knowledgeable regarding site operations, initial response actions, and spill response equipment and facilities. At the Facility, the On-Scene Coordinator is the Plant Operator on duty. Responsibilities of the On-Scene Coordinator are as follows:

- to ensure that on-site personnel have the appropriate training to respond to any spill;
- to assume complete authority over clean up personnel and the spill scene, as well as assume responsibility for all mitigation efforts, as required;
- to evaluate the initial situation and assess the magnitude of the problem;
- to report the spill to the NWT 24-HOUR SPILL REPORT LINE at 867.920.8130 as soon as possible;
- to activate the initial response plan;
- to alert and assemble key personnel in the on-site spill response team, as deemed appropriate, to handle the situation;
- to develop the plan of action for containment and clean-up of the specific incident, as well as direct and implement the plan;
- to ensure assigned responsibilities are carried out and the activities of spill response team members are coordinated;
- to assess the requirements for people, equipment, materials, and tools to contain the spill considering what resources are immediately available; urgency will depend on the nature of the spill;
- to assist the Director, Safety and Environment with regulatory and licensing reporting requirements, including gathering relevant information and submitting any formal reports (within the required time frame) to the applicable regulatory agencies and NTPC management detailing the occurrence of a spill; this includes submitting an incident reporting form;
- if authorized by the Manager, Plant Operations act as a spokesperson with the public, media, and government agencies, as required;
- to ensure that the spill response team is provided with proper PPE and spill response equipment; and, to ensure that all spill response personnel receive adequate training to fulfil their responsibilities in responding to a spill.

4.2.3 On-Site Spill Response Team

The On-Site Spill Response Team consists of the First Responder and specifically trained staff who are on site and ready to aid in the clean-up of a spill. Responsibilities are as follows:

- liaise with On-Scene Coordinator and keep them informed of clean-up activities;
- ensure on-site resources for spill response and clean-up are available;
- assist in obtaining any additional resources not available on site;
- ensure that appropriate PPE is worn properly; and
- conduct clean-up of spills under the direction of the On-Scene Coordinator.

4.2.4 Director, Health, Safety and Environment

In terms of spills, the Director, Health, Safety and Environment is responsible to:

- provide technical advice on the anticipated environmental impacts of the spill;
- advise on the effectiveness of various containment, recoveries, and disposal options, and suggest the most appropriate approach;
- if authorized by the NTPC Manager, Plant Operations may act as a spokesperson with the public, media, and government agencies, as required;
- monitor the effectiveness of the clean-up operation and recommend further work, if necessary;
- communicate with the various regulatory agencies as required; and
- complete and fax (867.873.6924) or email (spills@gov.nt.ca) a NWT SPILL REPORT Form to the NWT 24-HOUR SPILL REPORT LINE.

4.2.5 Manager Operations

In the case of a spill that is deemed to be a potential emergency, the Manger Operations is to:

- call the required senior leadership within NTPC (Table 4-1); and
- ensure that the On-Scene Coordinator is provided will adequate resources to deal with the spill / emergency.

4.2.6 President & CEO and the Director of Finance & CFO

In terms of spill response, responsible to:

- determine if an Emergency Response Team (ERT) is required; and
- determine the personnel on the ERT.

4.3 ORGANIZATIONAL COMMUNICATION PLAN

When a spill has been identified, report the spill to the Plant Operator. The Plant Operators work in two shifts, and one of them will always be on-site. They oversee the facility and of activating the SCP. They will also inform head office for tracking spills in the company database and notify the head office in the event of public inquiries. The Plant Operators can be reached 24 hours a day, as follows:

Plant Operator
Box 2250, Yellowknife, NT, X1A 2P7
(867) 669-3381

If the Plant Operator cannot be reached, contact the NTPC System Control, 24 hours a day, 365 days a year, as follows:

NTPC 24-Hour System Control
Box 2250, Yellowknife, NT, X1A 2P7
(867) 920-4203

If it is not safe to attempt a clean-up effort internally, the Plant Operator / On-Scene Coordinator will contact the Director, Health, Safety and Environment and Operations Manager, or the NTPC On-site Representative and the NWT 24-HOUR SPILL REPORT LINE to coordinate clean-up using external resources.

The President & CEO and the Director of Finance & CFO will determine if an Emergency Response Team (ERT) is required to deal with the emergency, and if so, who will be on the ERT from the various departments.

It is the job of the Director, Health, Safety & Environment, to contact the appropriate regulator, when necessary; either the Government of the Northwest Territories (GNWT) Department of Environment and Natural Resources (ENR), Indian and Northern Affairs Canada (INAC), or Department of Fisheries and Oceans (DFO).

If Regional Manager, Operations cannot be reached, contact **System Control** in Yellowknife (867-669-3370 phone, 867-669-3385 fax).

If spill response requires assistance or is an emergency, Manager, Operations or System Control must call the appropriate numbers according to region (see Table 4-3).

4.4 CALLS THAT MUST BE MADE

***Note**: all phone numbers use **area code 867** unless otherwise specified.*

When a hazardous materials spill is discovered, the Plant Operator notifies both:

- **Regional Manager, Operations** (see contact info in Table 4-1); and
- **24-Hr Spill Report Line** (920-8130 phone, 873-6924 fax).

If Regional Manager, Operations cannot be reached, contact **System Control** in Yellowknife (669-3370 phone, 669-3385 fax).

If spill response requires assistance or is an emergency, Manager, Operations or System Control must call the appropriate numbers according to region (Table 4-1).

Emergency Response Team: For the most serious emergencies (Level-Three Emergency or those involving spills into water) **Senior Leadership** will form the Emergency Response Team immediately (Table 4-2). Senior Leadership may opt to form this team for lesser emergency levels on a case-by-case basis. Should assistance from regulators or government be required (see Table 4-3).

Table 4-1: NTPC Emergency Response Phone List

Region	Position	Name	Phone (867)	Fax
All Regions Must Contact:	Director, Health, Safety & Env.	Edward Smith	874-5327 (work) 875-7737 (cell)	(888) 371-9433
	President & CEO	Noel Voykin	874-5276 (w) 875-7451 (c)	874-5349
	Director of Finance & CFO	Belinda Whitford	874-5219 (w) 780-991-9838 (c) 874-3862 (h)	874-5251
Region	**Position**	**Name**	**Phone (867)**	**Fax (867)**
Hydro Region	Director	Colin Steed	669-3326 (w) 445-4712 (c)	669-3318
	Manager, Operations North Slave	Stuart Robinson (acting)	669-3328 (w) 444-0985 (c)	669-3316
	Manager, Operations South Slave	Ken Bell	872-7110 (w) 872-0452 (c)	872-7149
	Manager, Electrical Services	Robert Burgin	669-3308 (w) 444-8424 (c)	669-3316
	Manager, System Control and Hydro Planning	Vacant		
Thermal Region	Director	Mike Ocko	777-7714 (w) 678-5667 (c)	777-4318
	Manager, Maintenance Services	Trevor Grant	777-7736 (w) 678-5778 (c)	777-4318

Table 4-2: Core Emergency Response Team Phone List

Position	Name	Phone (867)
President & CEO	Noel Voykin	874-5276 (w), 875-7451 (c)
Director, Finance & CFO	Belinda Whitford	874-5234 (w), 780-991-9838 (c)
Director, IT	D'arcy Delorey	874-5206 (w), 876-0168 (c)
Manager, Human Resources	Erin Dean	874-5228 (w) 876-0336 (c)
Director, Hydro Region	Colin Steed	669-3326 (w), 445-4712 (c)
Director, Thermal Region	Mike Ocko	777-7714 (w), 678-5667 (c)
Director, Health, Safety & Env.	Edward Smith	874-5327 (w), 875-7737 (c)
Communications Manager	Doug Pendergast	874-5202 (w), 876-1095 (c)
Manager, Budgeting and Regulatory Affairs	Cory Strang	874-5217 (w), 875-7676 (c)

Table 4-3: Local Agencies (in case of emergency only).

Contact	Phone (867)
Department of Fisheries and Oceans (DFO)	669-4900
Emergency Measures Organization (EMO)	873-7554
Environment and Natural Resources (ENR) North Slave Region Officer on call – after hours	873-7443 or 873-7476 873-7181
Department of Lands Inspectors Clint Ambrose (Manager, Resource Management North Slave Regional Office) (e) clint_ambrose@gov.nt.ca	 767-9188 (c) 446-0769
Public Works - Fort Simpson Region	695-2325
Public Works - Fort Smith Region	872-5526
Public Works - Inuvik Region	777-1298
Public Works - Yellowknife Region	873-1517
Mackenzie Valley Land and Water Board	669-0506
Wek'eezhii Land and Water Board	669-9590

5 ACTION PLAN

5.1 POTENTIAL DISCHARGE EVENTS – WORST CASE SCENARIOS

In Table 5-1, a list of potential discharge events, with associated discharge volumes and directions is presented for the primary hazardous materials stored on site. The most likely discharge volume is indicated, and the spill clean-up procedures will focus on the spills of this quantity. A worst-case scenario is also presented. Specific discharge rates are not indicated for each fuel types as these would vary from a few minutes to several hours, based on the source of leak or puncture.

Table 5-1: List of Hazardous Materials, Potential Discharge Events, Potential Discharge Volumes (Worst Case Scenario in Brackets) and Direction of Potential Discharge

Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Direction of Potential Discharge
Diesel Fuel (Camp Tank Farm, Construction Tank Farm, power generator, vehicles and equipment)	AST secondary containment/shell failure or seam/joint failure due to mechanical damage or corrosion Overfilling of ASTs at fill port Disconnection or failure of fuel transfer hose during AST filling operations from fuel supply tanker truck Overfilling of vehicles or equipment at dispensing area Transfer hose leak while dispensing Leak from fuel tanks on supply tankers, vehicles and equipment due to collision / accident	Likely < 1,000 L (max 750,000 L if catastrophic failure of diesel ASTs in the Construction Tank Farm)	Spills associated with ASTs will generally be contained within bermed secondary containment and/or within the fuel dispensing areas. General small spills to ground will spread out overland in direction of downward slope with potential for underground infiltration. Product released from failure of 450,000 L AST and 3–100,000 L ASTs will be contained with the secondary containment berm.
Gasoline (Camp Tank Farm, vehicles and equipment)	AST secondary containment/shell failure or seam/joint failure due to mechanical damage or corrosion Overfilling of ASTs at fill port Disconnection or failure of fuel transfer hose during AST filling operations from fuel supply tanker truck Overfilling of vehicles or equipment at dispensing area Transfer hose leak while dispensing Leak from fuel tanks on supply tankers, vehicles and equipment due to collision / accident	Likely < 1,000 L (max 10,000 L if catastrophic failure of all three gasoline ASTs in the Construction Tank Farm)	Spills associated with ASTs will spread out overland in direction of downward slope with potential for underground infiltration. General small spills to ground will spread out overland in direction of downward slope with potential for underground infiltration.

Table 5-1: List of Hazardous Materials, Potential Discharge Events, Potential Discharge Volumes (Worst Case Scenario in Brackets) and Direction of Potential Discharge (continued)

Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Direction of Potential Discharge
Jet Fuel (helicopter – none stored on site)	Leak from helicopter fuel tank due to collision / accident	Likely < 500 L (max 500 L)	On flat ground from helicopter pad with potential for underground infiltration.
New and Used Lubricating Oil (Oil Storage Building, Drum Storage Platform, Drummed Product containment at Construction Tank Farm, vehicles and equipment)	Leaks from vehicles / equipment Minor leaking product container or drum Large puncture, fast leaking container / drum in/outside of storage area Overfilling of used oil drums All containers / drums in storage area leaking at once (very unlikely)	Likely < 200 L (max 200 L; 1 drum used oil)	General small spills to ground will spread out overland in direction of downward slope with potential for underground infiltration. Product released at storage area will likely be contained by secondary containment system.
New and Used Glycol (Oil Storage Building, Drum Storage Platform, Drummed Product containment at Construction Tank Farm, vehicles and equipment)	Leaks from vehicles / equipment Minor leaking product container or drum Large puncture, fast leaking container / drum in/outside of storage area Overfilling of used oil drums All containers / drums in storage area leaking at once (very unlikely)	Likely < 200 L (max 200 L; one drum of used glycol)	General small spills to ground will spread out overland in direction of downward slope with potential for underground infiltration. Product released at storage area will likely be contained by secondary containment system.
Transformer Oil (Substation)	Minor slow leak from oil containment Significant failure of oil containment due to corrosion or critical system failure All transformer oil containment systems leaking at once (very unlikely)	Likely < 9,100 L (max 20,060 L)	On flat ground around the substation with potential for underground infiltration.
Propane (Accommodations, Material Storage Building)	Leak from open or failed / corroded valve Corrosion of cylinder shell Cylinder puncture / rupture from mechanical damage	Likely < 2,000 L (max 6,000 L)	To the air in the immediate vicinity of leak, moves laterally in same direction as wind, dissipates readily into the open air
Acetylene (Material Storage Building)	Leak from open or failed / corroded valve Corrosion of cylinder shell Cylinder puncture / rupture from mechanical damage	Likely < 80 lbs (max 160 lbs)	To the air in the immediate vicinity of leak, moves laterally in same direction as wind, dissipates readily into the open air

Table 5-1: List of Hazardous Materials, Potential Discharge Events, Potential Discharge Volumes (Worst Case Scenario in Brackets) and Direction of Potential Discharge (continued)

Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Direction of Potential Discharge
Oxygen (Material Storage Building)	Leak from open or failed / corroded valve Corrosion of cylinder shell Cylinder puncture / rupture from mechanical damage	Likely < 100 lbs (max 200 lbs)	To the air in the immediate vicinity of leak, moves laterally in same direction as wind, dissipates readily into the open air
Sewage	Overflow of underground tank due to overuse.	Likely < 50 L (max 200 L)	On flat ground around the camp trailer. Will move downhill towards the plant road.
Governor Oil	Accumulator tank leak	Likely <1,325 L (max 1,705 L)	Spilled governor oil will collect in the plant sump

5.2 POTENTIAL ENVIRONMENTAL IMPACTS OF SPILL (INCLUDE WORST CASE SCENARIO)

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

5.2.1 Flammable and Combustible Liquids

Flammable liquids have flash points below 37.8°C, evaporate quickly, and within a short period of time can reach high vapor concentrations in air. Flammable liquids at the Facility include, but are not limited to, gasoline and aviation fuel. Although not stored on site, aviation fuel will be present in helicopters landing at the Facility. Spills of flammable liquids represent an extreme fire and explosion hazard if vapour concentrations exceed the lower explosion limit (LEL). They are generally harmful if inhaled and can also be absorbed through the skin.

Combustible liquids such as diesel fuel have a **flash point above 37.8°C but below 93.3°C** and are not fire hazards at room temperature. The principal hazard from non-flammable, volatile liquid spills is exposure to the vapor by inhalation or skin absorption.

The most common flammable and combustible materials stored and handled on site are liquids such as gasoline, diesel, and waste oils. For the purposes of spill response actions, lubricants and motor oil have been included with the flammable and combustible compounds given their petroleum hydrocarbon based nature. Glycol product and used glycol spills will also be handled as flammable/combustible materials.

Gasoline

Environmental impacts: Gasoline may be harmful to wildlife and aquatic life. It is considered a carcinogen and does not readily biodegradable. Gasoline is quick to volatize. It has a relatively low solubility in water and is less dense than water, and hence can form a layer of non-aqueous phase liquid (NAPL) floating on top of water if released in sufficient quantities. Runoff into water bodies must be avoided.

Worst case scenario: Aboveground storage tank secondary containment failure or seam/joint failure and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

Diesel

Environmental impacts: Diesel may be harmful to wildlife and aquatic life. It is not readily biodegradable. Diesel burns slowly and thus the risk to the environment is reduced during recovery as burn can be more readily contained compared with volatile fuels. It has a relatively low solubility in water and is less dense than water, and hence can form a layer of NAPL floating on top of water if released in sufficient quantities. Runoff into water bodies must be avoided.

Worst case scenario: Aboveground storage tank secondary containment failure or seam/joint failure and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

Aviation Fuel

Environmental impacts: Aviation fuel may be harmful to wildlife and aquatic life. It does not readily biodegradable. Aviation fuel is quick to volatize. It has a relatively low solubility in water and is less dense than water, and hence can form a layer of non-aqueous phase liquid (NAPL) floating on top of water if released in sufficient quantities. Runoff into water bodies must be avoided.

Worst case scenario: Helicopter crashed on site, release fuel from its fuel tank. The spilled aviation fuel has the potential to seep into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and the water.

Oil Product, Used Oil and Miscellaneous Oils/Grease

Environmental impacts: Raw oil product, used oils may be harmful to wildlife and aquatic life. They are not readily biodegradable. These compounds generally have a low solubility in water, thereby separating into NAPL. Runoff into water bodies must be avoided.

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

Glycol and Used Glycol

Environmental impacts: Raw glycol (ethylene glycol) product and used glycol may be harmful to wildlife and to a lesser extent aquatic life. Glycol does not bioaccumulate and readily biodegrades in the environment. Glycol is not flammable or combustible. Glycol readily dissolves in water.

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

5.2.2 Compressed Gases

Compressed gases such as propane and acetylene are stored in relatively small quantities at the Facility. However, they are flammable gases and can ignite and explode if exposed to an ignition source. Vapours cannot be contained when released, and it is important that personnel withdraw immediately from any such release. If tanks are damaged, the gas should be allowed to disperse, with no attempt at recovery.

Compressed gas spills/leaks can generally be divided into two categories. The first are those leaks which occur away from the gas cylinder in lines, tubing, or apparatus. These types of leaks can generally be stopped by closing the main cylinder valve, if it is otherwise safe to do so. The second category of leak occurs at the cylinder itself, and cannot be stopped by closing the cylinder valve. In some cases, it may not be possible to close a cylinder valve due to age or poor condition, and as such, this situation falls into the second category of gas leak. **All leaking gas cylinders are considered an emergency if the leak cannot be stopped by closing the cylinder valve.** Leaks of oxygen, flammable gas, or toxic gas are especially dangerous.

Propane

Environmental impacts: Propane is extremely volatile and very flammable; thus, it represents a health hazard for fire and explosion. Propane is not considered toxic or harmful to wildlife or aquatic life or the environment in general. Propane is heavier than air and may travel a considerable distance to an ignition source. Cylinders may vent rapidly or rupture violently from pressure when involved in a fire situation.

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

Acetylene

Environmental impacts: Acetylene is not especially toxic to wildlife, aquatic life or the environment in general. Depending on the manufacturing process it can contain toxic impurities such as traces

of phosphine and arsine. Acetylene is extremely volatile and very flammable; thus, it represents a health hazard for fire and explosion.

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

Oxygen

Environmental impacts: Oxygen is not considered toxic or harmful to wildlife or aquatic life or the environment in general. Highly concentrated sources of oxygen promote rapid combustion and therefore are fire and explosion hazards in the presence of fuels.

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

5.2.3 Infectious Substances / Sewage

Infectious substances such as biological wastes from the sewage treatment plant are potentially hazardous when inhaled, ingested, and in contact with the eye. Initial preventative measures include wearing appropriate personal protective equipment (impermeable gloves, eye protection, and respirators appropriate for the size and type of spill). In the event of a spill on land, the material will be contained by diking or barrier. Liquids spilled in water will be dammed and diverted. Where raw sewage is spilled, the spill material can be sent to the sewage treatment plant to be processed.

Sewage

Environmental impacts: Microbes in raw sewage can enter the body via the nose, mouth, open wounds or by inhalation of aerosols or dusts. Raw sewage contains biological agents such as bacteria, viruses, fungi and parasites (e.g., tetanus bacterium Clostridium tetani, the parasitic worm Leptospira icterohaemorrhegiae, the Hepatitis A virus (HAV), protozoan parasites Giardia and Cryptosporidium, and bacteria E. coli) that can cause serious illness and even death. There is also a risk from contamination with unknown chemicals (such as solvents, fuels, general household cleaning chemicals) discharged with grey water and from toxic, irritant, asphyxiating or flammable gases in confined spaces (e.g., septic tanks). The risk of exposure when handling sewage can be reduced significantly by effective and immediate clean-up and by taking appropriate safety precautions.

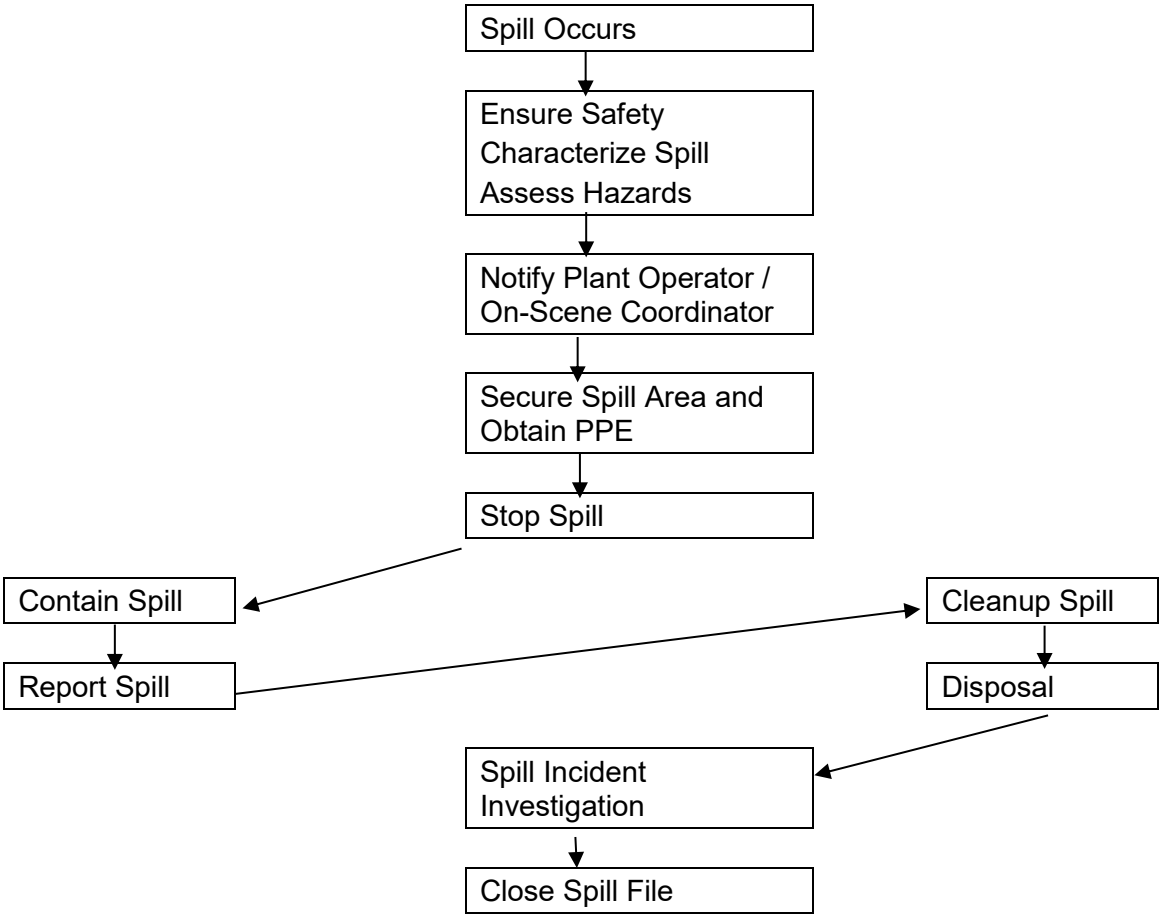
Worst case scenario: A major failure of the sewage treatment plant occurs and releases raw sewage to land. Spilled sewage could leak into the ground and/or flow overland and enter the

nearby lake. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

5.3 SPILL PROCEDURES

The following flowchart (Figure 5-1) outlines the overall steps to be taken in the event of a spill. The detailed description of what is required at each step is outlined in the Spill Response Procedure (Section 5.3.1).

Figure 5-1: Spill Response Flowchart



5.3.1 Spill Response Procedures

STEP 1 – Ensure safety, identify spill and assess hazards and risks

Initial actions for spills include ensuring personnel and site safety. Ensuring personnel and site safety is the responsibility of all parties, particularly the first responder who has the most knowledge of the spill. Upon the identification that a spill or release has occurred, the first responder shall perform the following:

- Ensure safety of yourself and all personnel.
- Alert all persons in the immediate area that a spill has occurred.
- Characterize Spill:
  - identify the material and its hazard potential (refer to SDS if necessary);
  - identify the source of the spill; and
  - identify the amount and the extent of the spill.
- Assess the spill hazards and risks to persons, property and the environment.

Note: *Where life or property is in danger, there is an emergency.* ***Get help.*** *Contact the local fire department, police or municipal authority.*

STEP 2 – Notify the Plant Operator / On-Scene Coordinator

After the details about the spill are known, the First Responder shall contact the Plant Operator / On-Scene Coordinator who will activate the SCP.

Note: *The Plant Operator / On-Scene Coordinator is to immediately contact the Manager, Operations (or NTPC On-site Representative) and/or Director, Health, Safety & Environment if a spill response exceeds the abilities/capabilities of onsite personnel or equipment and/or if there is a high potential of adverse effects to offsite areas and/or sensitive ecological or human receptors. See Figures 4-1 and 4-2 Organizational Communication Flowchart.*

STEP 3 – Secure Area and Obtain Personal Protective Equipment

Upon determining what the spilled product is and its hazard potential, the On-Scene Coordinator shall perform the following:

- Keep all personnel not directly involved with the spill response away from the spill area.
- Ensure all personnel involved in the spill response are aware of the hazards of the spilled product, spill response and the environment.
- Obtain the required response equipment and personal protective equipment for the spill response team members.

STEP 4 – Stop Spill

If Safe to do:

- Locate the spill source and stop it/shut it off (e.g. turn off pump, close valve, turn off equipment, turn off-power source).
- Shut off ignition sources.
- Shut off operating equipment.
- Attend to the injured (refer to SDS for first aid response).
- If a spill occurs from the wall of a tank and cannot be stopped, transfer the product from the leaking tank to another storage tank to reduce the amount spilled. Use secondary containment (drum or pail) to catch the product and prevent further impact where possible.

STEP 5 - Contain Spill

- Determine the direction and speed the spill is moving. Determine what is causing the spill to move (wind, gravity, water, etc.).
- Determine what will be affected by the spill (environment, property).
- Determine the best location where the spill can be contained with available staff and equipment.
- Determine actions to reduce risk/damage to human health, the environment and property because of the spill.
  - Contain the spill. Refer to Appendix E for containment methods. Refer to Section 6 and Appendix F for a list of spill response equipment.
  - First attempt to contain the spill so as to prevent its entry directly into a potable water source, water body or into a ditch or conveyance that eventually discharges in to a water body.
  - **Should the spill reach the water, IMMEDIATELY** shut down both generator plants 1 and 2, and stretch a sorbent boom across at the tailrace narrows, and use sorbent pads and booms to collect product from the water's surface.
- Prepare a contingency plan in case the spill gets out of control of present staff and equipment.

Note: *Do not contain compounds (e.g. gasoline, aviation fuel) if vapours might accumulate and ignite – allow them to volatilise.*

STEP 6 - Report Spill

- Completely fill out a Spill Report Form (Appendix A) and fax to the 24-HOUR SPILL REPORT LINE, Health, Safety & Environment Department, and Manager, Operations as specified on the form. Form also available on PowerLine.
- For large fuel spills follow the Fuel Spill Calculations Procedures (Appendix B) to determine the spill volume.
- Refer to Section 5.3.2 for additional information on spill reporting procedures.
- Contact the INAC Inspector at 669-2768.

STEP 7 - Spill Recovery / Clean-up and Disposal

- Prior to initiating clean-up and disposal procedures, the appropriate regulatory body and the Director, Safety & Environment must approve the procedures.
- Refer to Sections 5.6 to 5.9 of this SCP for information on product recovery / clean-up, storage, disposal, and site clean-up procedures.
- Upon completion of clean-up fill out a Spill Update Form (Appendix C) and fax as directed on form. Form also available on PowerLine.

STEP 8 – Spill Incident Investigation

- Plant Operator in consultation with Director, Health, Safety & Environment and Manager Operations to conduct an internal review of the spill cause, effects, and effectiveness of the SCP procedures.
- Investigation findings to be used to develop corrective actions.

STEP 9 - Close Spill File

- The Director, Health, Safety & Environment will follow up with the appropriate regulatory body to ensure that a satisfactory clean-up and/or remediation of affected areas has been completed.

5.3.2 Spill Reporting Procedures

NTPC policy is to report all spills of fuel or hazardous materials adjacent to or into a water body, regardless of quantity, or spills of hazardous materials over 5 litres unless the minimum quantity specified in the NWT Spill Contingency Planning and Reporting regulation is more stringent (i.e. less than 5 L).

A person reporting a spill shall give as much of the following information as possible:

a) Date and time of spill.
b) Location of spill.

c) Direction the spill is moving.
d) Name and phone number of a contact person close to the location of spill.
e) Type of containment spilled, and quantity spilled.
f) Cause of spill.
g) Whether the spill is continuing or has stopped.
h) Description of existing containment.
I) Action taken to contain, recover, clean up and dispose of spilled contaminants.
j) Name, address and phone number of person reporting spill.
k) Name of owner or person in charge, management or control of contaminants at time of spill.

Reporting shall not be delayed because of the lack of knowledge of any of the factors listed. No person shall knowingly make a false report of a spill or potential spill.

It is the responsibility of the Plant Operator to report the spill to the 24-HOUR SPILL REPORT LINE at (867) 920-8130, and they shall perform the following:

1. Fill out the SPILL REPORT Form as completely as possible. The form is available through the NTPC Intranet PowerLine (Appendix A). If required for a large fuel spill, follow the Fuel Spill Calculation Procedures (Appendix B) to determine the spill volume.
2. Fax or phone in the Spill Report Immediately to the 24-HOUR SPILL REPORT LINE at:

Fax: (867) 873-6924
Phone: (867) 920-8130

***NOTE**: Collect telephone calls can be made by informing the Operator that you wish to report a spill. RCMP communications may be used if other means are not available.*

3. Fax Spill Report to Health, Safety & Environment Department and Manager, Operations. See phone list (Table 4-1) for contact info.

5.4 DECONTAMINATION

Adjacent to, or near the spill zone, decontamination stations will be established. The decontamination stations will be constructed so that personnel will pass through the station prior to leaving the contaminated area. The decontamination stations may be bermed and lined with plastic sheeting. Washing solutions may be placed near the spill site. All solutions in tubs will be clearly marked.

***Note:** Notwithstanding the preceding, all applicable health and safety rules, regulations, and legislation will be adhered to.*

5.5 CONTAINMENT

The following section describes various methods which may be employed to contain a spill to land, water, ice or snow.

5.5.1 Containment of Spills on Land

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

The following methods are described in more detail in Appendix E:

- Dykes
- Trenches
- Dams

5.5.2 Containment of Spills to Water

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

The following methods are described in more detail in Appendix E:

- Booms
- Weirs
- Barriers

5.5.3 Containment of Spills on or Under Ice

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

The following methods are described in more detail in Appendix E:

- Dykes
- Trenches
- Snow Fence and Sorbent Barrier
- Burning
- Ice Slotting

- Vertical Barriers

5.5.3.1 Containment of Spills on Snow

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

The following methods are described in more detail in Appendix E:

- Dykes

5.5.4 Barrel Containment

If liquid is leaking from a barrel and the leak cannot be plugged nor are there overpack drums on hand, the barrel can be rolled onto its side so that the leaking area is at the highest point, and will therefore no longer leak. A leak may be plugged with wooden wedges wrapped with a cloth or heavy-duty tape, or by placing an inner tube around the barrel over top of the leak. The inner tube can be tightened by twisting it with a rod or stick. These methods are to be used as temporary seals only. The liquid needs to be transferred into a new barrel or storage tank as soon as possible to prevent further contamination.

5.6 RECOVERY / CLEANUP

In most cases, spill recovery / clean-up is initiated at the far end of the spill and contained moving toward the centre of the spill. Fuel recovery methods generally include direct suction, mechanical removal, and the use of sorbent material. A water spray mist may be used to herd the fuel to an area for collection.

All materials mentioned in this section are available in the spill kits located at the Facility. Following clean-up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible.

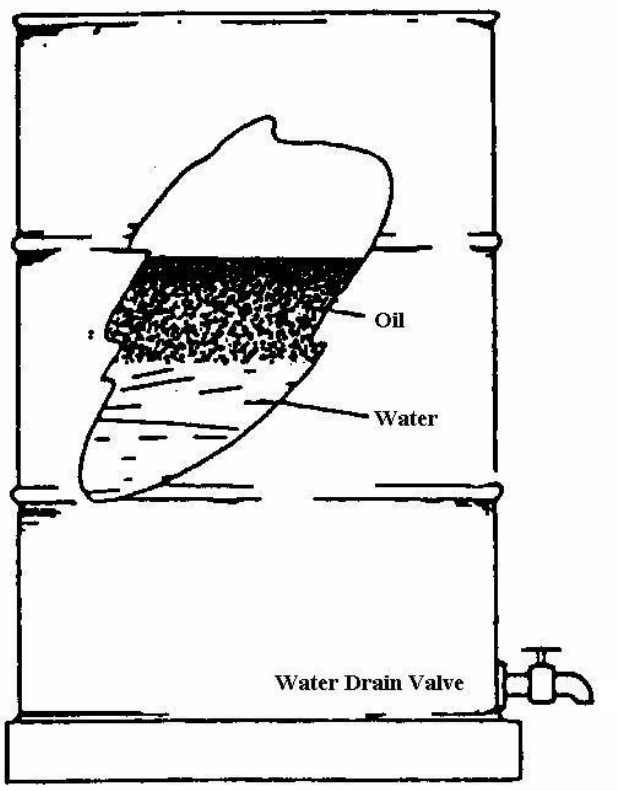
5.6.1 Direct Suction Equipment and Techniques

Direct suction methods include the use of vacuum trucks, portable pumps, or shop vacuums. Vacuum cleaners or portable pumps can be used to directly recover materials from damaged containers or from thick slicks on water.

Shop vacuums are suitable for small spills if a power source is available. Commercial skimmers are available for attachment to vacuum sources. These skimmers serve to skim floating product from the water surface while reducing the amount of water recovered. Suction screens may be required to prevent hose plugging by floating debris and to prevent pump damage.

Care should also be taken to prevent the uptake of water to minimize both the final volume of material that requires disposal and to prevent emulsification of oil and water. Once removed from the water body, however, water and oil can be separated using gravity separation. Valving on vacuum trucks can be used for water/oil separation, or a drum separator may be readily constructed using a 205-litre (45-gallon) drum and plumbing hardware (Figure 5 2).

Figure 5-2: Improvised Oil-Water Separator Drum



5.6.2 Manual and Mechanical Recovery

Manual recovery by use of hand tools (e.g. cans, buckets, shovels, rakes) is an effective means of recovering fuel from small spills or from areas that are inaccessible to larger equipment. This is often the only method available, and in some cases is preferred as it causes the least amount of damage to an area.

Mechanical recovery using heavy construction equipment can be used in some cases for recovery and loading of material for disposal. Caution must be used when operating such equipment around a spill site. In some instances, more damage can be caused from the operation of the equipment than from the spilled product. Escaping petroleum vapours may also be present and pose the danger of explosion and fire.

5.6.3 Sorbent Material

Sorbent materials are commonly used for final clean-up and recovery of small amounts of oil or to remove oil in places that are inaccessible to other means of recovery. They are effective in recovering thin as well as thick layers of oil, however large volumes of sorbent are often required. Used sorbent materials are to be placed in drums and burned in the incinerator.

The types of sorbent materials available at the Facility and generally available for spill response are listed in Section 6 and Appendix F.

Snow and soil can be used as effective sorbent materials. Once mixed, the oil in snow or soil mixture can be shovelled or picked up using construction equipment and taken to a suitable treatment site.

5.7 STORAGE

Storage is required:

- if a suitable location for disposal cannot be found;
- if climatic conditions do not permit disposal at the time of clean-up;
- if the selection of a disposal option requires further assessment; or
- if transportation to a treatment/disposal facility is dependent on the availability of a suitable transport vehicle.

Storage options generally consist of pails, drums, tanks, berms, or pits. The specific type of storage needed is dependent on the volume of recovered material, the degree of contamination of the water and/or soil, the properties of the spilled product, and the duration of storage required.

5.7.1 Vehicle Storage

Vehicles suited for the storage of recovered fuel are tank trucks, vacuum trucks, dump trucks, flatbed trucks, sled-mounted tanks, and transport trailers. Tank trucks may be used to separate oil and water by emptying the water from the bottom of the tank. Tank trucks typically hold up to 20 m3, while vacuum trucks typically hold around 16 m^3.

Flatbed trucks and transport trailers are suitable for carrying tanks and drums braced on pallets.

5.7.2 Open-Topped Tanks

Open-topped tanks such as plastic-lined swimming pools with capacities up to 20 m3 may be quickly assembled on firm, level ground. They may be fed by several hoses at once and can store both liquids and solids. These should be used only for short-term storage when storing fuel.

5.7.3 Drums

Tanks and drums, which are available in all communities, may be used for temporary storage of fuel.

5.8 DISPOSAL

Disposal or destruction of recovered fuel is needed to eliminate the risk of further contamination from the recovered fuel. **No decision, except under emergency conditions, should be made until approval has been obtained from the Director, Safety & Environment and appropriate government agencies.**

5.8.1 Salvage and Recycle

Recovered diesel and lubricating oil may be reused directly as a low-grade heating fuel in waste oil furnaces.

5.8.2 Fuel Burning

Open burning of spilled oil products is not an acceptable disposal method. Open burning is prohibited except in the case of an extreme emergency. Only appropriate government regulators can authorize controlled or open burning of spilled products. This option will only be considered in extreme emergencies (i.e. when humans or environmental receptors are in grave danger of extensive contamination) and following consultations between the Manager, Health, Safety & Environment and INAC.

5.8.1 Glycol Spill Response

As noted above, only very limited quantities of glycol (ethylene glycol) are used and stored at the Facility (for use in the generators). Details on amounts, storage and potential spill scenarios are provided in tables 2-1, 2-2 and 5-1.

Studies have shown that ethylene glycol is readily biodegradable under both aerobic and anaerobic conditions in soils and water. Research has also demonstrated that ethylene glycol has a low toxicity to aquatic organisms. Accidental glycol spills on the ground (and in the snow) will be treated as described for PHC in the sections above. Considering the small quantities stored and the protective measures at the storage locations, it is considered unlikely that accidentally spilled glycol will enter ground or surface water through runoff processes.

5.9 SITE RESTORATION

For spills of reportable sizes, once a spill has been contained, the Manager, Health, Safety and Environment will consult with the INAC or lead agency Inspector assigned to the file to determine the level of clean-up required. The Inspector may require a site-specific study to ensure appropriate clean up levels are met. Methods that may be considered include natural biodegradation of oil and replacement of soil and re-vegetation (see below for further details).

Upon completion of spill clean-up efforts, the Plant Operator will conduct an internal review of the spill cause, effects and SCP procedures and then fill out the Spill Update Form (Appendix C) and fax it as directed on form to the Manager, Health, Safety and Environment and Manager, Operations. The Spill Update Form also available on NTPC Intranet PowerLine.

5.9.1 Natural Assimilation (Biodegradation) and Revegetation

Oil can be degraded naturally by microorganisms under proper temperature and nutrient conditions. Tilling the affected soil to increase exposure of the soil organisms and oil to oxygen can also be beneficial. The utilization of natural assimilation to treat, in whole or in part, soils affected by spilled oils requires the approval of government agencies.

5.9.2 Replacement of Soil

In some cases, it is necessary to replace contaminated soil with clean soil. This can include grass or sod on the upper layer of soil. Before contaminated material is removed, regulatory agencies must be contacted regarding acceptable disposal sites. Spills that take place on tundra receive special attention due to the presence of sensitive soils and plants. Replacing contaminated tundra may be more detrimental to the area than allowing the contamination to naturally degrade.

Shovels, front-end loaders, backhoes, and dozers may be used to excavate contaminated soil.

6 RESOURCE INVENTORY

The facility maintains numerous resources to support spill response including on and off-site resources.

6.1 ON-SITE RESOURCES

Spill materials and/or spill kits are located throughout the Facility at all designated hazardous materials and waste storage areas. Further details on the types of spill material and spill kits that may be present at the Facility is presented in Appendix F.

There are several spill kits at the Facility, locations and sizes of the kits are as follows:

Drum size and quantity	Location	Notes
2x 95 Gallon Drum Kits	G1 and G2 Tailraces	Kits focus on spills to water, altered to include 4 10' booms 
4x 30 Gallon Drum Kits	IFR Head gate, Main Head gate, Helipad, Boat Launch	Standard Kits 
5x 30L Nylon Bag Kits	Loader, Excavator, Truck, Barge and 1 extra	Standard Kits 

If additional response material is required, booms and extra sorbent pads can be found in the open storage shed. In addition, earth moving, and other equipment located at the Facility is also listed below.

- One Excavators, 300 HP
- One Loader, 200 HP
- Pick-up Truck
- Sorbent pads and booms
- Large plastic overpack drum
- Hand tools (shovels and rakes)
- Personal protective equipment
- Pumps and hoses

- Portable fuel storage (empty drums)
- Tiger torch
- Chain saw

7 LOCAL AGENCIES (IN CASE OF EMERGENCY)

Depending on the severity of the spill, heavy equipment is available from Yellowknife for emergency spill clean-up. However, the equipment can only be delivered to site by winter road or barge, and thus will likely take one or more days to arrive on-site, weather permitting. Contact information and equipment available is as follows:

Table 7-1: Heavy Equipment Owners Contact Information

Name	Phone Number	Available Equipment
City of Yellowknife	(867) 920-5600	Fire Truck
Camco Construction Ltd	(867) 873-8522	Front End Loader Dump Truck Backhoe Bull Dozer Grader Snow Plow Vacuum Truck Digger truck with Auger
RTL Robinson Enterprises td.	(867) 873-6271	Front End Loader Dump Truck Backhoe Bull Dozer Grader Snow Plow Vacuum Truck Digger truck with Auger

Table 7-2: Local Agencies (in case of emergency only)

Contact	Phone
Department of Fisheries and Oceans (DFO)	(867) 669-4900
Department of Lands Inspectors Clint Ambrose Manager, Resource Management (Inspector)	(867) 767-9188 (e) clint_ambrose@gov.nt.ca (c) (867) 446-0769
Emergency Measures Organization (EMO)	(867) 873-7554
Environment and Natural Resources (ENR)	(867) 873-7654
Public Works - Fort Simpson Region	(867) 695-2325
Public Works - Fort Smith Region	(867) 872-5526
Public Works - Inuvik Region	(867) 777-1298
Public Works - Yellowknife Region	(867) 873-1517
Mackenzie Valley Land and Water Board	(867) 669-0506
Wek'eezhii Land and Water Board	(867) 669-9590
Environment Canada (Emergency) Yellowknife	(867) 669-4725
Greater NWT (GNWT) Environment Protection Office	(867) 873-7654
GNWT Environmental Health Office	(867) 669-8979
RCMP (Yellowknife)	(867) 669-1111
Coast Guard – Auxiliary Central & Arctic Region	1-800-267-7270
Medivac (Yellowknife)	(867) 669-4115
Great Slave Helicopters (Yellowknife)	(867) 873-2081
Air Tindi (Yellowknife)	(867) 669-8218 or 669-8200
Arctic Sunwest (Yellowknife)	(867) 873-4464

8 TRAINING PROGRAM

NTPC conducts site orientations that include SCP and spill response equipment awareness. Both employees and contractors must complete the NTPC Site Orientation upon entering the Facility for the first time and prior to conducting work. The NTPC Plant Operator or Construction Safety Coordinator provides the site orientation, which provides an overview of this SCP, the locations of spill response equipment (as outlined in Figure 2-4), and the procedures to report and respond to a spill incident. Records of site orientations are maintained.

For key NTPC employees responsible to coordinate a response to spill events, NTPC provides an SCP awareness course. In addition to the information provided during the site orientation, spill responders are given a detailed review of this SCP; introduced to step-by-step methods to identify, assess, and respond to spill situations; participate in a review of hazardous materials located on-site and the associated risks; learn how to use absorbent and other spill response equipment; and learn how to properly dispose of contaminated spill response equipment. A mock spill exercise may be performed to familiarize on-site spill responders with the equipment available and the steps to take during typical spills situations that may occur that the Site.

All contractors are required to have basic first aid and WHMIS training before being allowed to work at the Site. All Site employees and supervisors are also required to have WHMIS and first aid training. Persons involved in the handling and shipping of hazardous materials are required to be trained in the Transportation of Dangerous Goods Regulation (TDG) requirements and must have a valid TDG certificate.

An up-to-date training matrix is kept by the NTPC Training Coordinator and contains records of all environmental, health and safety training completed by employees.

8.1 SPILL CONTINGENCY PLAN TRAINING PROGRAM

The NTPC SCP Training Program is mandatory for all employees. It includes a 55-slide PowerPoint presentation and reviews the following details pertaining to the NTPC spill response processes and this SCP:

- scope;
- person in charge;
- community information;
- facility site specifics;
- layout;
- sensitive environmental receptors;

- spill control;
- on site product storage;
- power transformers;
- bulk petroleum product storage;
- product information;
- spill kits and spill response equipment; and
- heavy equipment.
- health and safety;
- spill response procedures;
- spill reporting;
- general clean-up methods; and
- spill volume calculation procedures.

Employees are not permitted on NTPC facilities without first undergoing the SCP Training Program. Records of employee training are available to all managers.

9 PUBLIC RELATIONS

9.1 GENERAL POLICY ON PUBLIC RELATIONS

If questioned by the public or the media about a spill, refer them to the Regional Director.

Environmental incidents such as spills often attract local interest and media attention. Employees should not make any statements on behalf of the Corporation to the media or to the public. It is the responsibility of the Regional Director and/or the NTPC Marketing & Communications Officer to address the media and thereby the public.

Respond fully to any request from local authorities or emergency workers that will help to control the spill and its damage; however, refer all other requests for information to the Regional Director. This may include questions from reporters, environmental agencies, or people and property owners affected by a spill. When probing questions are asked, it is important that the response is polite and professional; for example:

> *"I'm sorry; I don't have the authority to answer that question. Please contact my Regional Director. His/her phone number is _____."*

Employees should avoid guessing at an answer or making promises that are out of their control, as this can cause problems later for both the employee and the Corporation. No speculation should be made regarding who is at fault, why the spill occurred, spill volume, when clean-up will be completed, or any other issue. It is the responsibility of the company representative at the site to keep the Regional Director informed so that media questions directed to the Corporation can be answered.

APPENDIX A

NWT SPILL REPORT FORM

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

Government of Northwest Territories · Nunavut · Canada · Inuvialuit Land Administration

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: MM DD YY	Report Time:	☐ Original Spill Report **OR** ☐ Update # _____ to the Original Spill Report	**Report Number:**
B	Occurrence Date: MM DD YY	Occurrence Time:		
C	Land Use Permit Number (if applicable):		Water Licence Number (if applicable):	
D	Geographic Place Name or Distance and Direction from the Named Location:		Region: ☐ NT ☐ 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: ☐ Potential Spill	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:	Employer:	Location Called:	Report Line Number:

Lead Agency: ☐ EC ☐ CCG/TCMSS ☐ GNWT ☐ GN ☐ ILA ☐ AANDC ☐ NEB ☐ Other: _____

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:			

APPENDIX B

FUEL SPILL CALCULATION PROCEDURES

FUEL SPILL RESPONSE PROCEDURE

In the even of a fuel spill the following steps must be taken:

1. Assess hazards
2. Shut off source of spill
3. Contain spill
4. Calculate amount of fuel spilled
5. Report Spill
6. Spill cleanup and disposal
7. Debriefing

FUEL SPILL CALCULATIONS

Once the source of the spill is shut off and the initial spill containment is underway it is essential to determine the exact amount of fuel spilled. To do so, the following information must be gathered:

1. Gauge the tank with the fuel spill and record the reading
2. Record the fuel temperature
3. Record the generator kWh readings for each engine in the plant
4. Obtain a copy of the last *Month End Thermal Generation Report* (Month End Report)

FUEL DIFFERENCE CALCULATION

1. Record last month's fuel storage volume (Month End Report pages 4-6, line 7)
   - e.g., 33,737 L

2. Add any fuel received between last month end and the fuel spill
   - e.g., no fuel was received (0 L)

3. Conduct a tank dip and record the depth of fuel
   - e.g., 98 cm

4. From the tank dip chart for that specific tank determine the volume of fuel in the tank
   - e.g., 22,708 L

5. Using the recorded fuel temperature obtain the multiplier from the Temperature Compensation Chart
   - e.g., -28^0C = 1.0383

6. Obtain the amount of temperature compensated fuel in storage
   - e.g., (22,708 L x 1.0383) = 23,578 L

7. Subtract temperature compensated fuel volume from last month end volume to calculate **Fuel Used Since Last Month End**
   - e.g., (33,737 L – 23,578 L) = 10,159 L
   - This means that the fuel used and spilled since last month end totals 10,159 L

FUEL USED IN GENERATION (Table 1 below corresponds with the following steps)

1. Take the present kWh meter readings for each generator from the kWh meter in the generator switchgear
   - e.g.,G1 (17,748,000 kWh), G2 (10,110 kWh), G3 (10,820 kWh)

2. Record the previous meter readings from each generator from Month End Report
   - e.g., G1 (17,735,465 kWh), G2 (10,087 kWh), G3 (10,809 kWh)

3. Subtract the difference between present and last month end readings for each generator
   - e.g., G1 (12,535 kWh), G2 (23 kWh), G3 (11 kWh)

4. Obtain meter multipliers from the meters or the Month End Report
   - e.g., G1(x 1), G2(x 600), and G3 (x 600).

5. Obtain actual kWh generated by each unit in the plant using the multiplier
   - e.g., G1 (12,535), G2 (13,800), G3 (6,600)

6. Add the actual generation for all units to get the total generation from end of last month to present
   - e.g., 32,935 kWh

7. Obtain the fuel efficiency from the Month End Report
   - e.g., 3.47 kWh/L

8. Calculate fuel used to generate 32,935 kWh by applying fuel efficiency to total generation
   - e.g., (32,935 kWh / 3.47 kWh/L) = 9,491 L

9. Calculate the **Actual Spill Volume** (fuel used since last month end minus fuel used to generate during this period)
   - e.g., (10,159 L – 9,491 L) = 668 L

Table 1: Calculation Example – Fuel Used in Generation

Unit	G1	G2	G3
1. Present meter reading (kWh)	17,748,000	10,110	10,820
2. Previous meter reading (kWh)	17,735,465	10,087	10,809
3. Difference (kWh)	12,535	23	11
4. Multiplier	1	600	600
5. Actual kWh per generator	12,535	13,800	6,600
6. Total kWh generated	G1 +G2 + G3		32,935
7. Fuel efficiency (kWh/L)			3.47
8. Fuel used in generation (L)	32,935 kWh / 3.47 kWh/L		9,491 L
9. Total fuel spilled (L)	10,159 L – 9491 L		668 L

APPENDIX C

SPILL UPDATE FORM

NORTHWEST TERRITORIES POWER CORPORATION

Spill Update

Submit

Report Update to Supervisor & Environment Dept. Refer to *Policy EV-05, Hazardous Materials Spill Reporting* for more information	**Environment Dept.** Phone: (867) 874-5327 Fax: 1-888-371-9433

1 Report Date	2 NWT Spill Number and/or Date and Time of Incident

3 Stage of Cleanup	Cleanup Not Required ☐	Cleanup Continuing ☐ Expected Completion Date:	Cleanup Completed ☐ Date Completed:

4 Initial Action Plan: Describe each step.

	Y	N	Brief Description
Step 1: Identify product and hazards	☐	☐	
Step 2: Shut off source of spill	☐	☐	
Step 3: a) Spill containment	☐	☐	
b) Report spill	☐	☐	Supervisor ☐ Env. Dept. ☐ NWT 24-hr Spill Report Line ☐
Step 4: Spill cleanup and disposal	☐	☐	
Step 5: Debriefing	☐	☐	

Cleanup Personnel:

Reported by:	Position:	Location:	Telephone No:
Spill Update reported to (please check boxes):	Environmental Department ☐	Supervisor (enter details below) ☐	
Reported to:	Position:	Location:	Telephone No:

* Place additional comments and notes on page 2.

** Ensure to note any potential impacts to sensitive human or ecological receptors, and any impacts to offsite areas.

Spill Update

Additional Comments

APPENDIX D

ENVIRONMENTAL PROTECTION POLICY

Policy Name: **Environmental Protection**

Policy Number: EV-01

Policy Monitor: Director Health, Safety & Environment

Policy Approver: President & CEO

Approval Date: October 22, 2019

Purpose

The purpose of this policy is to outline the approach to environmental management at the Northwest Territories Power Corporation (NTPC) and to demonstrate NTPC's commitment to environmental protection.

Policy Statement

NTPC is committed to protecting the environment for existing and future generations by meeting, if not exceeding, environmental regulations. Our environmental principles are based on the fundamental values of responsibility, accountability, and open communication. We will strive for continuous improvement in environmental performance and will manage our operations in an environmentally responsible manner.

Guidelines

NTPC will:

- Comply with all applicable environmental legislation, licences, permits, authorizations, and guidelines;
- Maintain an Environmental Management System;
- Incorporate environmental planning in the design phase of projects;
- Reduce waste and use resources as efficiently as possible;
- Take reasonable measures to prevent and reduce pollution to air, water, and soil;
- Manage hazardous waste in a manner that minimizes risk to the environment;
- Report all hazardous materials spills released to water, regardless of size;

- Report all hazardous materials spills greater than 5 L to ground or floor;
- Clean up all hazardous materials spills to meet applicable environmental criteria;
- Promote the efficient use of energy to customers;
- Provide employees with the appropriate training and education to help them fulfill their environmental responsibilities;
- Communicate regularly with indigenous groups, government, regulators, industry, community groups, and the public regarding NTPC activities; and
- Respect the heritages of the people and communities that we serve.

Roles and Responsibilities

- Everyone has a responsibility to protect the environment.
- NTPC is responsible for the implementation of the Environmental Protection Policy and for providing an environmentally responsible workplace.
- Management is responsible for the implementation of the Environmental Management System and for the environmental performance of NTPC employees.
- Employees are responsible to comply with all environmental rules and regulations and to continually practice environmental protection while performing their duties.
- The Environment Department is responsible to maintain the Environmental Protection Policy and the Environmental Management System with input from

employees and other stakeholders.

Policy History

Date	Revision #	Description of Change
June 18, 1993	0	New policy
Sept 11, 1997	1	Wording revision
April 10, 2001	2	Wording revision
November 26, 2006	3	Wording revision
March 17, 2010	4	Whole document revision
November 15, 2012	5	Template changed
February 15, 2018	6	Policy revision
October 22, 2019	7	Policy revision

President & CEO Signature: Date: October 22, 2019

APPENDIX E

SPILL CONTAINMENT METHODS

- **Containment of Spills on Land**
- **Containment of Spills on Water**
- **Containment of Spills on and Under Ice**
- **Containment of Spills on Snow**

Specific Spill Containment Methods for Land, Water, Ice and Snow

The following section describes various methods which may be employed to contain a spill to land, water, ice or snow.

Containment of Spills on Land

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

Dykes

Dykes can be created using soil surrounding a spill on land. These dykes are constructed around the perimeter or down slope of the spilled fuel. A dyke needs to be built up to a size that will ensure the containment of the maximum quantity of fuel that may reach it. A plastic tarp can be placed on and at the base of the dyke such that fuel can pool up and the subsequently be removed with sorbent materials or by pump into barrels or bags. If the spill is migrating very slowly a dyke may not be necessary and sorbents can be used to soak up fuels before they migrate away from the source of the spill.

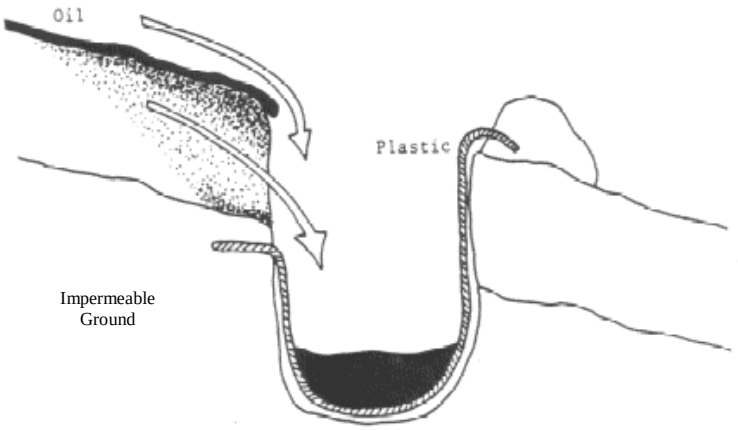
Trenches

Trenches can be dug out to contain spills if the top layer of soil is thawed. Backhoes, loaders, shovels, or pick axes can be used depending on the size of the trench required. It is recommended that the trench be dug to the bedrock or permafrost, which will then provide containment layer for the spilled fuel. Fuel can then be recovered using a pump or sorbent materials. Care must be given when working in or near trenches as fumes can build up, causing fire and respiratory hazards. Ensure proper PPE is worn and ignition sources are removed from the area.

If water is present in the excavated trenches, it should be assumed that groundwater contamination may result and eventually be discharged into surface waters. A waterproof liner should be placed on the bottom and sides of the trench.

Shallow trenches placed downslope of the spill will be effective in trapping fuel travelling both on the surface and below the surface (Figure E-1). Sorbent pads, socks, and booms should be placed in the trench to collect spilled product.

Figure E-1: Trench



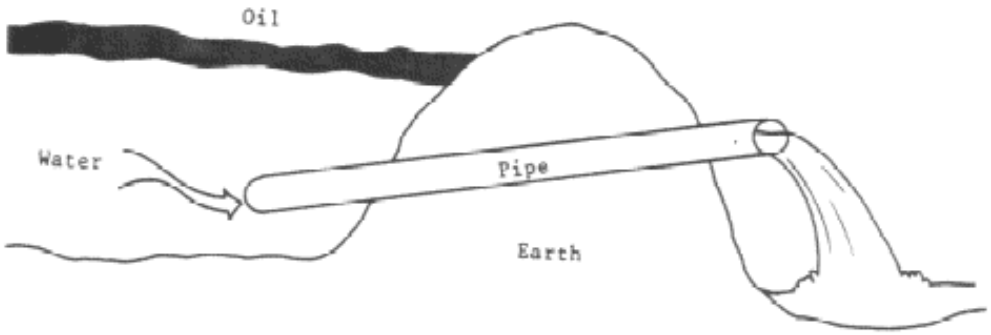
Dams

Dams constructed across ditches can be used to contain a spill and stop its flow. A dam may be built with earth, wood, sandbags, and/or snow. The dam should be lined with plastic sheeting to make it impermeable to the spilled product. In freezing conditions water may be sprayed on a dam to form ice, thereby making the dam impermeable.

Care should be taken to ensure that a dam is large enough to contain the entire spill; insufficient capacity may result in overtopping failure.

For ditches with flowing water or for small streams, it may be necessary to allow water flow to continue while retaining the lighter-than-water liquids (i.e.: hydrocarbons). This can be achieved by building water bypass dams: an earth dam is built stopping the flow of water and oil in the ditch; a pipe is then installed below the water level and passing through the dam. This allows the water to continue flowing while the dam retains the lighter-than-water products (Figure E-2).

Figure E-2: Water Bypass Dam



Containment of Spills to Water

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

Booms

Booms are commonly used to contain a spill of floating liquid or debris, to deflect or divert material to a defined area so that it may be recovered, and to protect sensitive areas from contamination (Figure E-3). Booms are designed to float and have absorbent materials built into them to absorb fuels at the edge of the boom.

Boom deployment is important, as the angle of the boom in relation to the speed of the water affects how well the oil may be contained. The faster the stream, the more angled the boom must be (Figure E-4).

Several booms arranged in parallel may be necessary to contain all the product. These should be spaced to allow product, which may escape the first boom, to float to the surface and be contained by the next boom. In addition, the use of several booms permits one boom to be removed at a time for cleaning.

Booms may be either commercially made or homemade. Commercially made booms are designed to float and keep product from escaping under the boom. Homemade booms may be constructed from logs, railroad ties, power poles, trees, lumber, inflated fire hose, or Styrofoam. These may be used to deflect floating material to shore or to keep floating material within a contained area. Individual sections are connected by rope, chain, or wire. A seal around the joints to prevent leakage can be made by wrapping with plastic sheets or burlap.

Wooden or other floating booms can be used to contain the spilled fluid itself or the sorbent containing the product. They can also be used upstream of sorbent booms to improve the efficiency and longevity of the sorbent material.

Fuel contained within the boom will need to be recovered using sorbent materials or pumps and placed into barrels or bags for disposal.

Figure E-3: Boom Usage

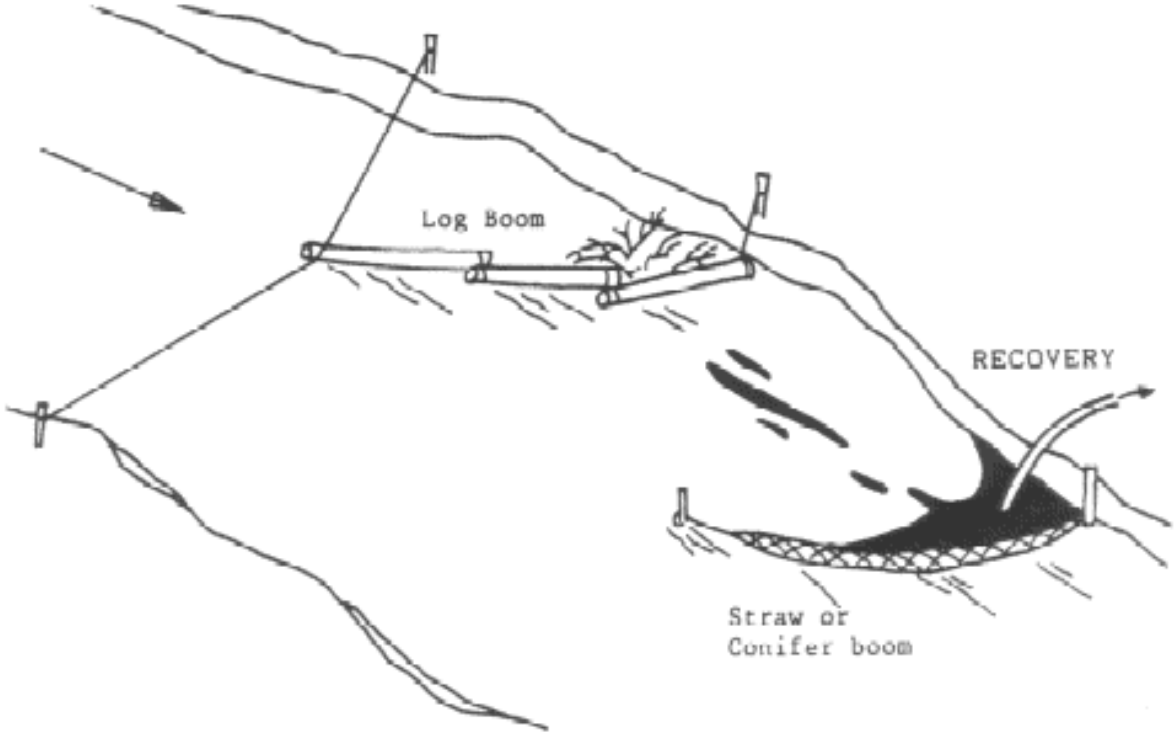
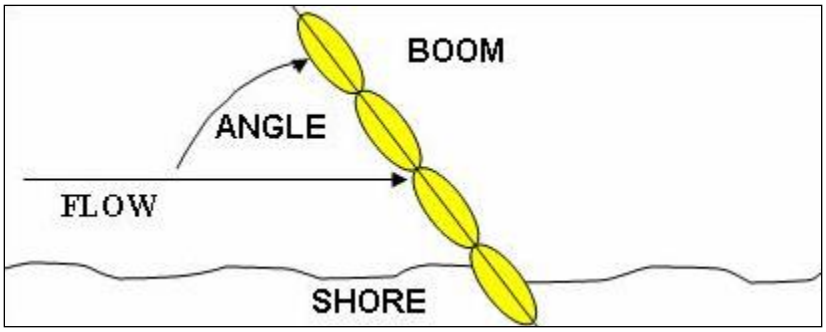


Figure E-4: Boom Deployment

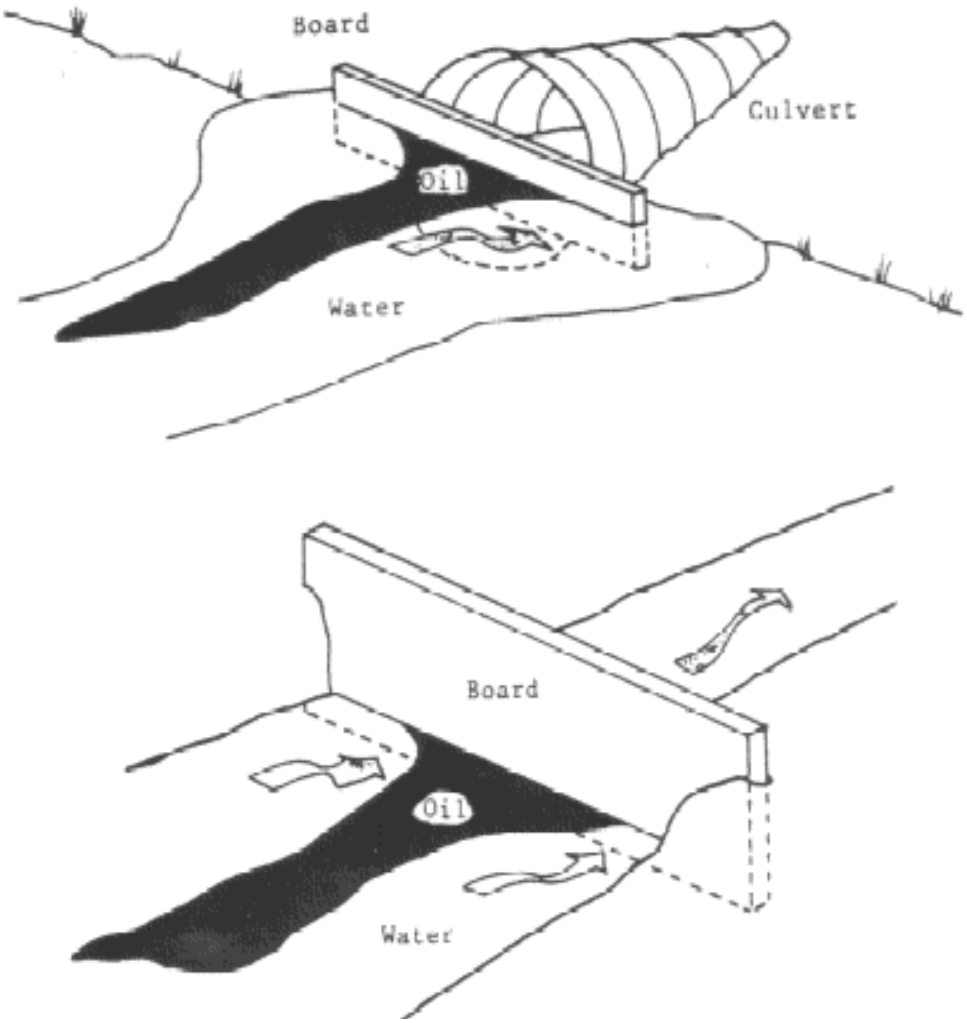


Weirs

Weirs can be used to contain spills in streams, ditches, at culvert entrances and to prevent further migration downstream.

Materials commonly used such as plywood, lumber, and sheet metal may be placed into and across the width of the stream/ditch/culvert such that water can still flow under the weir. Spilled fuel will float on the water surface and be contained at the foot of the weir (Figure E-5). It can then be removed using sorbents, booms or pumps and placed into barrels or plastic bags.

Figure E-5: Weirs



Barriers

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

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

Containment of Spills on and Under Ice

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

Dykes

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

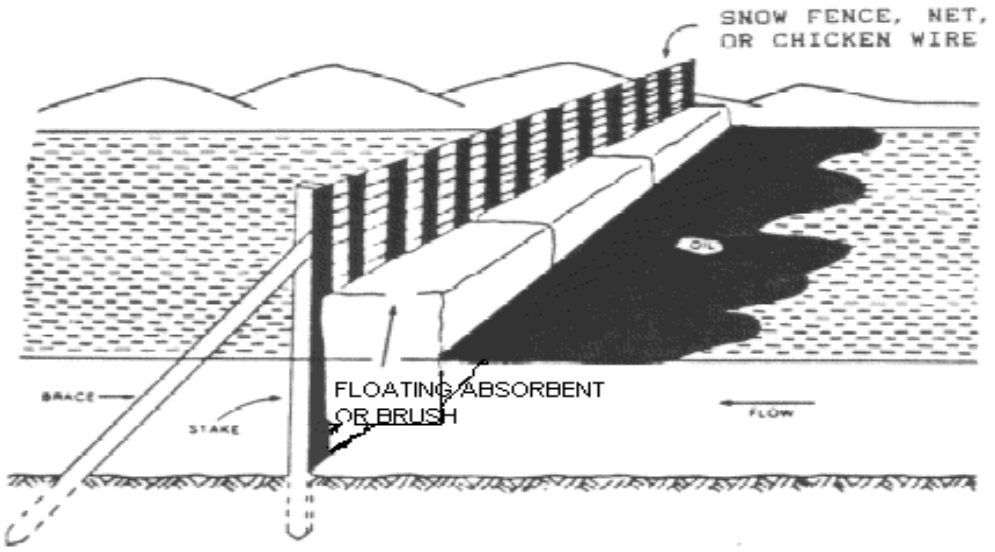
Trenches

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

Snow Fence and Sorbent Barrier

Snow fence and sorbent barriers may be used in streams (less than 1 m deep) with soft beds into which stakes can be driven. This method is limited to summer conditions. A snow fence barrier is installed to span the width of the stream, anchored at both ends, and stakes are driven into the stream bottom at 1 to 2 m intervals along the fence. Commercial sorbents are placed on the upstream side of the fence and are held against it by the current. Sorbents will float against the upstream side of the barrier, but must be replaced before they become soaked with product and sink. The barrier should be angled against the current for shore side collection. Multiple snow fence barriers can provide backup against potential losses from upstream barriers. Net or chicken wire barriers can be constructed in the same way, and are more practical for stronger currents, as water can flow through them more easily (Figure E-6).

Figure E-6: Barrier and Sorbent



Burning

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

Ice Slotting

For spills under the ice in rivers or streams when current speeds are slow (i.e. less than 0.5 m/s), ice slotting may be used. A trench is cut into the ice using a chain saw or trenching machine at an angle to the current, to deflect and concentrate product that passes through the area (Figure E-7, E-8). Because of thick ice encountered during the winter, cutting and removal of ice blocks is often difficult. Loaders or backhoes may be needed to lift blocks out of the slot, or to push blocks down. Product that accumulates in the ice slot may be pumped out, adsorbed, or burned in place.

Figure E-7: Ice Slot

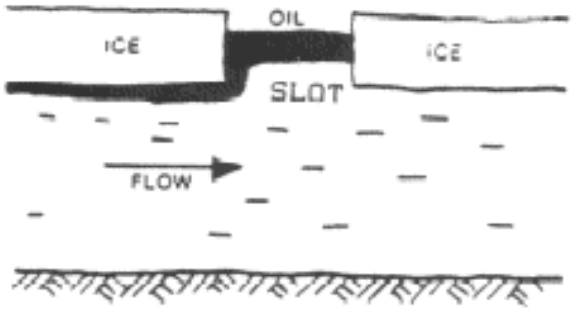
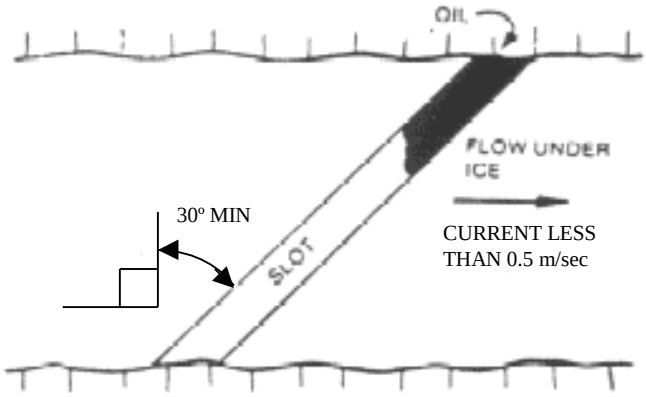


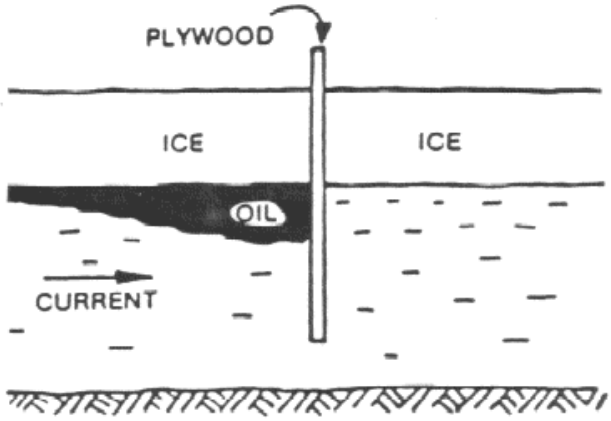
Figure E-8: Angled Ice Slot



Vertical Barriers

If the spill goes under the ice in deep, slow moving water, vertical barriers such as plywood may be used to deflect product (Figure E-9). The ice must be strong enough to support the necessary personnel and equipment. Vertical barriers are put in place by cutting trenches in the ice at an angle to current flow, inserting the plywood barriers, and allowing them to freeze in place. The location of the spilled product may be monitored by drilling observation holes with an ice-auger.

Figure E-9: Vertical Barriers



Containment of Spills on Snow

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

Dykes

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

APPENDIX F

SPILL KITS

9.2 SPILL KITS AND EQUIPMENT

NTPC employs two types of sorbent for spill response.

- **Universal Sorbents:** These sorbents pick up most liquids including fuel, oil, glycol, and water. They are used for general spill cleanup on dry land and will sink if placed on water, as they adsorb the water (hydrophilic). For this reason, universal sorbents are not to be used on hydrocarbon spills into water.
- **Oil Only Sorbents:** These sorbents only pick up hydrocarbons, such as fuel or lube oil. These sorbents float, as they do not pick up water (hydrophobic), and are to be used for any hydrocarbon spill into water.

Higher quality sorbents will wick up, contain, and retain spilled product much faster and more effectively than low quality sorbent, due to a finer weave of material. Low quality sorbent pads are used around the Facility to clean up drips while higher quality sorbents, found in the spill kits, are used for larger spills.

All plants are equipped with universal sorbent pads for day to day use and the cleanup of spills. For any large or significant spills, spill kits are available for containment and cleanup. Spill kits can be stored both indoors and outdoors and are generally contained in one of the following (see Figure F-1):

- **Overpack Drum:** A yellow plastic drum designed to contain a leaking drum or used/unused spill material.
- **Steel Salvage Drum:** A 205 L steel drum with removable top used to contain used/unused spill material, impacted soil or snow, etc.
- **Spill Kit Locker**: A plastic bin used for spill kit material storage.

Figure F-1: Typical Spill Kits

Spill kits generally contain the following spill response materials:

- **Sorbent Booms:** When a spill occurs into water, floating booms are placed around the spill perimeter to provide containment. Typically, a 5 or 8-inch diameter plastic net tube filled with sorbent material, booms prevent the spill from spreading and/or moving downstream to contaminate other areas (see Figure F-2).

Figure F-2: Sorbent Booms

Booms can be clipped together for extra length. The ends should be clipped together so that they overlap, leaving no space at the joint. This ensures that no spilled product leaks out past the boom, and the boom effectively contains and adsorbs the spilled product (see Figure F-3).

- **Sorbent Socks:** Socks are identical to booms in construction; however, they do not clip together. They are generally used for small scale, localized spills.
- **Sorbent Pads**: Individual pads used on drips or leaks.

- **Sorbent Rolls:** A continuous roll of sorbent pads.
- **Printed Disposal Bags**: Soiled absorbent material is put into printed disposal bags which are then tied off for disposal.
- **Instruction Book:** The spill kit instruction book provides information regarding spill kit equipment.
- **Personal Protective Equipment:** Used to augment Facility equipment and supplies. Includes rubber gloves, safety goggles, and protective coveralls.

Figure F-3: Boom Deployment

APPENDIX G

ACRONYMS

ACRONYMS

AST	Aboveground Storage Tank
CE	Chief Engineer
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
CPR	Cardiopulmonary Resuscitation
DFO	Department of Fisheries and Oceans
EC	Environment Canada
EMO	Emergency Measures Organization
ENR	GNWT Dept. of Environment and Natural Resources
ERT	Emergency Response Team
GNWT	Government of the Northwest Territories
INAC	Indian and Northern Affairs Canada
IT	Information Technology
SDS	Safety Data Sheets
NTCL	Northern Transportation Company Ltd.
NTPC	Northwest Territories Power Corporation
NWT	Northwest Territories
PPD	GNWT Petroleum Products Division
PPE	Personal Protective Equipment
RCMP	Royal Canadian Mounted Police
SCP	Spill Contingency Plan
UST	Underground Storage Tank
WHMIS	Workplace Hazardous Materials Information System