CITY OF IQALUIT

SPILL CONTINGENCY PLAN

UPDATED: MAY, 2016

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Glossary of Contact Information

EXTERAL ASSISTANCE – GOVERNMENT RESOURCES	
AGENCY	**TELEPHONE #**
24-Hour Spill Line	(867)920-8130

CITY OF IQALUIT			
CONTACT	**PAGER #**	**WORK #**	**CELL #**
Dispatch	N/A	979-5650	-
Chief Administrative Officer (CAO)	N/A	979-5666	222-2953
Director of Public Works & Engineering	N/A	975-8509	222-2965
Operations Superintendent, Public Works	N/A	979-5631	222-2956
Manager of Engineering (Vacant)	N/A	-	-
Utilidor Manager	N/A	979-5632	222-2966
Utilidor on-call	32	N/A	222-3243
Garage/Roads Foreman	N/A	979-5668	N/A
Trucked Services Foreman	N/A	979-5612	222-2947

EMERGENCY SERVICES			
CONTACT	**PAGER #**	**WORK #**	**CELL #**
Dispatch	N/A	979-5650	-
Duty Officer (Fire/Ambulance)	N/A	979-4422	-
Fire Chief	N/A	979-5657	222-5073
Deputy Fire Chief	N/A	979-5650	222-2955
Deputy Fire Chief	N/A	979-5650	222-3981
Chief Municipal Enforcement Officer	N/A	979-5670	222-5521
RCMP	N/A	979-1111 979-0123	

CONTRACTOR	CONTACT #
Baffin Building Systems (BBS)	979-5903
Kudlik Construction Ltd	979-1166
Nunavut Excavating Ltd	975-3320
RL Hanson	979-6004
Tower Arctic Ltd	979-6465
Qikiqtaaluk Environmental (QE)	
Nunatta Environmental	

CONTRACTOR	CONTACT #
Environmental Protection, Government of Nunavut	975-5900
Indian and Northern Affairs Canada, Nunavut District Manager	975-4295
Indian and Northern Affairs Canada, Baffin Sub-District	975-4295
Environment and Climate Change Canada, Iqaluit	975-4636
Department of Fisheries and Oceans, Iqaluit	979-8000
Regional Public Health Officer, Government of Nunavut	979-7652

1.0 INTRODUCTION

The purpose of this spill contingency plan is to outline a formal practical response system which can be implemented immediately in the event of a deleterious material, such as sewage or fuels, being spilled to the natural environment. **The scope of the document includes spills resulting from activities carried out by the City of Iqaluit or from the failure of a system component in the City's infrastructure only.** This plan is intended to promote the safe handling of potentially hazardous materials to minimize health hazards, environmental damage and clean up costs. The plan is written so it can be easily understood and be reasonably comprehensive in providing access to all information required for handling a spill.

It is the City's policy to:

i. Comply with existing regulations;
ii. Provide such protection of the environment as is technically and economically feasible;
iii. Take appropriate action with the necessary resources to remedy a spill situation as soon as it becomes evident;
iv. Cooperate with other groups to protect the environment;
v. Ensure an on-going preventative maintenance program is implemented for all City facilities and to upgrade infrastructure when appropriate; and
vi. Keep employees, government officials and the public informed.

Included with this plan is a one page "If You Discover a Spill" response sheet that is intended to be carried in City vehicles and posted in municipal work areas. In an emergency situation, prompt action is important and quick access to a response checklist may reduce the seriousness of a spill.

A sites plan has been included in Appendix A showing the existing layout of all buildings and waste handling/disposal facilities in the City.

This 2016 version of the Spill Contingency Plan has incorporated all information from the following documents:

1. City of Iqaluit Spill Contingency Plan, Dillon Consulting Limited, 2004.
2. City of Iqaluit Sewage Life Station Spill Contingency Plan, Dillon Consulting Limited, 2003.
3. City of Iqaluit Sewage Lagoon Preparedness Plan, Dillon Consulting Limited, 2003.

2.0 REPORTING PROCEDURES

City of Iqaluit employees have access to mobile radios and key personnel can be reached through dispatch by pager on a 24-hour basis. The dispatch number is monitored 24 hours per day.

All spills that are determined to be the responsibility of the City and only these spills are reported to the dispatch number.

All spills exceeding reportable quantities are to be reported immediately to the NWT 24-hour Spill Report Line. Spill Report Line personnel will provide direction and will ensure that an investigation is undertaken by the appropriate government authority. Appendix C contains a listing of material and the quantities that are reportable in the event of a spill:

Equipment may be dispatched for City spill clean-up by the Director of Public Works & Engineering only.

The 24-Hour Spill Line is currently being run by the GNWT-Resources, Wildlife and Economic Development division. Callers to the spill line will be provided with expert advice regarding hazardous materials spills. The personnel at the spill line will also ensure that the government agencies with jurisdiction over the spill are contacted.

The effectiveness of this spill contingency plan will greatly depend upon the following factors:

- The proper distribution of the plan to those personnel most likely to encounter a spill or release of deleterious substance during the course of their normal work,
- Training of these same personnel as to the objectives and contents of this plan and how they should react upon encountering a spill or system failure that may result in a subsequent release of deleterious substances,
- Training of the response personnel as to what steps they are required to take in the event of the plan being put into action.

2.1 Spill Finder's (First Responder) Response

In most cases, the first responder will be trained on-call personnel experienced in assessing the situation and proceeding in accordance with the strategy as outlined below.

a. Be alert and consider your personal safety first,

b. Assess the hazard to persons in the vicinity of the spill and where possible take action to control danger to human life. If possible, identify the material or products involved in this particular incident,

c. If the spill creates a fire, explosion or other hazard to human life, remove all potential ignition sources, if possible, evacuate the area, contact the RCMP,

d. If safe and practical try to take appropriate action to stop the release of material,

e. Contact Dispatch and report the spill,

f. Contact the Utility Foreman and report the spill,

g. Mark the spill scene to warn the public and prevent access.

2.2 Director of Public Works & Engineering Response

Once notified by the Fire Department or Dispatch, the Director of Public Works & Engineering shall:

a. Proceed to the spill location.

b. Liaise with the Fire Chief.

The Fire Chief and Director of Public Works & Engineering are then responsible to ensure the following steps are carried out:

a. Make the necessary arrangements for first aid and removal of injured personnel. Take the necessary action, where possible, to secure the site to protect human safety.

b. If not already done and if it is safe to do so, take the appropriate action to stop the flow or release of material. If at all possible take the necessary action to contain or prevent the spread of the spilled material,

c. Gather information on the status of the situation,

d. Fill out as completely as possible, a spill report form (attached) and then contact the 24 Hour Spill Line,

e. If required, contact the CAO.

The Director of Public Works & Engineering will be the overall municipal coordinator for any spill response action, and as such the Director will:

- Work in conjunction with the lead agency to coordinate clean up personnel,
- Be responsible for evaluating the initial situation and assessing the magnitude of the problem,
- Activate the response plan and call out the key personnel in the response team, as deemed appropriate, to meet the situation.
- Assist in developing the overall plan of action for containment and clean up of the specific incident and delegate the responsibility for implementing the plan,
- Ensure that the assigned responsibilities are carried out and that coordination exists between supervisory team members,
- Assess the requirements for personnel, equipment, materials and tools to contain the spill in light of what resources are immediately available. The urgency will depend on the nature and magnitude of the spill.

Additionally, it will be the Director of Public Works & Engineering responsibility to ensure that all City spill response personnel receive adequate training in order to fulfill their responsibilities as part of the spill response team.

3.0 SITE INFORMATION AND FAILURE PREVENTION

3.1 Sewage Spills

It is the purpose of this section to outline possible failures of the waste handling/treatment system and the control measures in place to prevent such failures. The location of the lift stations and force main are shown in Figure 1 in Appendix A. Material that is released due to a spill will be collected and disposed of in the sewage lagoon.

3.1.1 Sewage Lift Station

There are two lift stations currently servicing the sewage system in Iqaluit. Lift Station No. 1 is located by the break water and Lift Station No. 2 is located by the sea lift beach (location of all facilities is shown in Appendix A). In the event of a pump shut down, both sewage lift stations will eventually overflow into Koojesse Inlet. The pumps are electrically powered, and will not operate if there is a power failure. The lift stations are physically checked on a daily basis.

In the event of a pump shutdown, there is approximately 20 minutes storage capacity in the wet wells before the sewage will overflow. Each lift station is equipped with fluid high level alarms that trigger auto dialers which contact the 20 Hour Dispatch number. Sewage trucks are dispatched to manually pump out the wet wells. The lift stations are equipped with diesel powered pumps and piping that may be connected for manual operation during power outages.

Upon shut down, all sewage lift stations will eventually overflow to a designated low lying area or body of water to prevent a public health hazard through contact with raw sewage. The following is a list of the lift stations and the body of water or lift station that will receive sewage overflows:

- Liftstation No. 1: Koojesse Inlet
- Liftstation No. 2: Koojesse Inlet

Each lift station has the following main components:

- A wet-well that receives the raw sewage.
- Two self-priming centrifugal pumps.
- Float levels in the wet-well that control the pumps
- Monitoring for high level of sewage in the wet-wells.
- Building low temperature alarms.
- Motor starters, domestic electrical (lighting) and electric heat.
- Alarms result in activation of the autodialer that will notify Town Dispatch of the alarm at the lift station.

Rating of the lift station pumps are as follows;

	Sewage Lift Station 1	Sewage Lift Station 2
Manufacturer	Gorman Rupp	Gorman Rupp
Model	T6A3S – B	T3A3S – B
Size	150 mm	75 mm
Impeller Diameter	314.3 mm	215.9 mm
RPM	1770	1160
Motor	30 HP	5 HP
Design Discharge	44 l/s	12.6 l/s
Head	17.7 m	11.6 m

All lift stations are checked once per day, 7 days per week. Daily records are kept on the status of the lift stations.

3.1.2 Sewage Force Main

The sewage force main is routed entirely beneath the ground surface and is not monitored.

3.1.3 Sewage Lagoon

The sewage lagoon is located at the head of Koojesse Inlet on the southwest side of the Municipality.

The Iqaluit sewage lagoon was originally constructed in 1978 by erecting two dykes stretching from the northwestern shoreline to a nearby island in Koojesse Inlet. The lagoon covered an area of approximately 17,000 m^2 with a retention volume of 32,000 m^3. The lagoon was reconstructed in 1991, and the retention volume was reduced to a maximum of 25,000 m^3. At the current sewage production rate of 1,800 m^3/day, retention times vary between 6.7 and 13.8 days.

Sewage is transferred to the lagoon by truck and through the force main by gravity flow. The inlet is located on the north side of the lagoon. Outflow from the lagoon is primarily through the west dyke, which was designed to be “leaky”. Seepage through the dyke provides some level of solids removal. The effluent discharges directly into Koojesse Inlet.

The majority of the discharge occurs, as intended, though the west dyke as it is at a lower elevation than the east dyke. Seeps have appeared on the west dyke on two separate occasions, prompting concern regarding the structural integrity of the dyke. The lagoon has an operation detention volume of between 12,000 m3 and 25,000 m3 at operating water levels of 0.7 m to 1.5 m. Sewage enters the lagoon at a rate of approximately 1,800 m3/day.

In the event of dyke failure, sewage will drain directly into Koojesse Inlet.

3.2 Fuel and Gasoline Storage

Diesel fuel and gasoline is stored in above ground self-contained tanks at the main municipal garage. Diesel is kept in a 20,000L tank and gasoline is kept in a 4,500L tank. Spill clean-up material at the garage consists of "Absorball" pellets which are taken to the landfill and burned after use.

A 2,000L above ground self contained tank is located adjacent to the water treatment plant. It is used to store heating fuel.

The fuel storage tanks are not located near areas considered to be environmentally sensitive.

3.3 Chlorine Gas

Chlorine gas is stored at the water treatment plant. Two Class 'A' response suites, 2 Scott pack and personal chlorine detectors are stored at this location. A fixed chlorine detector is also mounted in the storage area.

3.4 Calcium Chloride

Calcium chloride for use on the roads is stored in Tyvex bags at the main garage.

3.5 Glycol

Glycol in 45 gallon drums is stored at the main garage. There are generally no more than 10 drums present at any given time.

3.6 Hydrofluosilicic Acid

Hydrofluosilicic acid for fluoridating the City water supply is stored at the water treatment plant.

3.7 Lime

A maximum of 150 – 25lb bags of lime are stored at the water treatment center for use in controlling the pH of the municipal water supply.

3.8 Sodium Hypochlorite, 12%

Up to 12-20L containers of sodium hypochlorite are stored at the entrance to the water treatment plant.

3.9 Propane

Two 40lb propane cylinders, used to fuel the Zamboni, are stored in the Zamboni room at the arena.

3.10 Sodium Hydroxide Solution

(Caustic Soda 50%) is stored at the water treatment plant.

3.11 Carus UPZ 985

(Zinc Ortho Phosphate) is stored at the water treatment plant.

4.0 SYSTEM COMPONENT FAILURE PREVENTION

4.1 Sewage Lift Station

Should a spill become apparent at either Lift station, the Utility Foreman would:

- Ensure public safety at all times and if required, notify Dispatch and the Fire Department.
- Contact the 24-Hour Spill Report Line
- Mobilize staff to determine the cause of the problem, whether in the lift station or dump station and repair if possible with staff and outside resources, where required.
- Contact the Operations Superintendent or Trucked Services Foreman to request sewage pumper trucks and mobilize the City's equipment as well. Sewage would be taken from the wet well and hauled to the lagoon.
- Mobilize equipment, including loaders, backhoes and dump trucks, to construct a temporary berm to prevent sewage from entering Koojesse Inlet.
- Clean up contaminated areas and haul material to the lagoon for disposal.

A similar response would be undertaken with other lift stations with the exception of berm construction which is site specific.

The City has had to respond to lift station sewage overflows in the past. The response team and measures taken to date have proven effective. The City seeks to improve its contingency planning with input from the regulating authorities and other parties.

4.2 Sewage Force Main

The sewage force main is completely buried and is not monitored.

4.3 Sewage Lagoon

Under normal conditions, the lagoon is monitored seven days per week. The lagoon level is checked and the dykes are inspected for leaks. If problems are suspected with the lagoon, the monitoring frequency will increase.

4.4 Chlorine Gas Storage

A fixed chlorine gas detector is installed in the chlorine gas storage room.

5.0 RESPONSE TEAM, ACTION AND EQUIPMENT

Key personnel have been identified for emergency spill response. They are identified below with their key role in the event of a spill:

Director of Public Works & Engineering	Personnel, Loaders and Trucks
Chief Administrative Officer	Media
Fire Chief	Trucks, Fire Retardant Foam and Emergency Measures Organizations

- The Director of Public Works & Engineering and the Fire Chief work together to coordinate the mobilization of men and equipment as required to contain the spill.
- The Chief Administrative Officer is in charge of coordinating the information and messages flow to the media.
- The Fire Chief will provide personnel and equipment to assist in a spill response action. If the situation is deemed to require it, the Fire Chief will call out the Emergency Measures Organization (EMO).

The following details the response to be taken in case of a spill or leak at the locations outlined in section 3:

5.1 Sewage Spills

Should a sewage spill become apparent, the Director of Public Works & Engineering would be responsible to:

- Ensure the public safety at all times and if required, notify the Fire Department and CAO,
- Contact the NWT 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem, and act to stop the release of the sewage,
- Mobilize equipment as required to contain the spill through trenching, berming, etc. to prevent sewage from entering Koojesse Inlet,
- Clean up contaminated areas with suction trucks, loaders, dump trucks and absorbent materials as required.

5.2 Sewage Lagoon

In the event of a dyke breach, essentially raw sewage will be discharged directly into Koojesse Inlet with potentially negative effects on the local fish and shellfish populations. As such, it is important that potential dyke failures be dealt with as quickly as possible. The Director of Public Works & Engineering should be informed immediately if liquid is detected seeping or flowing through the dyke walls.

Upon notification of seepage through the dyke, the Director of Public Works & Engineering should:

- Proceed to the site to evaluate the nature of and extent of the problem,

- Contact the 24-hour Spill Report Line,
- Mobilize equipment and manpower as required to contain the sewage and carry our repairs to the dyke.

These actions are more fully outlined in Section 2.2. If possible, any sewage released through the dyke breach should be pumped back into the lagoon.

5.3 Fuel and Gasoline Spills

In the event of a fuel or gasoline spill, the Fire Chief would be contacted by Dispatch and would be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works & Engineering and the CAO.

The Director of Public Works & Engineering is then responsible to:

- Contact the NWT 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem, and to act to stop the release of the product,
- Mobilize equipment as required to contain the spill through trenching, berming, etc.
- Clean up contaminated areas with hand tools, suction trucks, loaders, dump trucks and absorbent materials as required.

5.4 Chlorine Gas Leaks

In the event of a chlorine gas leak, the Fire Chief would be contacted by dispatch and would be responsible to:

- Ensure the public safety at all times and to notify the Director of Public Works & Engineering and the CAO,

The Director of Public Works & Engineering is then responsible to:

- Contact the 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem and to act to contain the material, if possible to do so in a safe manner, using the available capping tools,
- If the cylinder cannot be capped, arrange for their transport to a safe area and allow the gas to escape,
- Dispose of the faulty cylinders in such a manner as to minimize the risk to human health.

5.5 Hydrofluosilicic Acid

Spills of this material less than 5L will be cleaned up by the Water Treatment Plant Operator using acid neutralizing material. The Water Treatment Plant Operator will notify the Utilidor Foreman of the spill. For spills in excess of 5L, the Water Treatment Plant Operator will

evacuate the immediate area and notify Dispatch. Dispatch will contact the Fire Department. The Fire Chief will then be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works & Engineering and the CAO,

Upon notification by the Fire Chief or Dispatch, the Director of Public Works & Engineering will be responsible to:

- Contact the 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem and act to contain the material if possible to do so in a safe manner,
- Dispose of the neutralized material according to GNWT regulations.

5.6 Sodium Hypochlorite

Spills of this material less than 5L will be cleaned up by the Water Treatment Plant Operator using appropriate neutralizing material. The Water Treatment Plant Operator will notify the Utilidor Foreman of the spill. For spills in excess of 5L, the Water Treatment Plant Operator will evacuate the immediate area and notify Dispatch. Dispatch will contact the Fire Department. The Fire Chief will then be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works & Engineering and the CAO.

  Upon notification by the Fire Chief or the Dispatch, the Director of Public Works & Engineering will be responsible to:

- Contact the 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem and act to contain the material if possible to do so in a safe manner,
- Dispose of the neutralized material according to GNWT regulations.

6.0 GENERAL SPILLS

The following sections provide general information on the handling of large volume spills to a variety of receptors. In Iqaluit, sewage and petroleum products are stored in sufficient quantities that a large volume spill could occur.

6.1 Sewage Spills

6.1.1 Containment on Land

Containment of large volume sewage spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. The location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

6.1.2 Containment on Surface Water

As sewage will readily mix with water it may prove impossible to contain the spill once water is reached. Strong action should be taken to prevent the material from entering a water body and to stop the material discharge at the source. Care should be taken to ensure public health and safety (eg. Protect water intakes, etc.) and the long term environmental effects of the spill should be monitored.

If the water is flowing through a drainage ditch or smaller stream, a channel should be constructed to divert the water flow around the spill area. A dam should be constructed to contain the water the sewage has already entered.

6.1.3 Containment on Ice

Containment of spills on ice will be affected by the load bearing strength of the ice. If it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dykes should be lined with plastic to make it impermeable to the sewage. Water may be sprayed on snow dams/dykes to form a impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

6.1.4 Containment on Snow

Snow will readily absorb liquids, which may facilitate the removal of spilled material to a recovery or disposal site. Saturated contaminated snow may be collected relatively easily and hauled away. Compacted snow can be used to create an effective physical barrier to reduce the spread of spilled materials.

Several types of snow containment structures may be constructed to contain spilled materials. Snow dykes and dams can be erected and then lined with an impermeable liner or sprayed with water to form an impermeable ice layer. Initially the snow around the perimeter of the spill can be compacted, eg. With a snowmobile, to slow the movement of contaminants. The saturated snow can be collected with hand tools or heavy equipment and removed to the sewage lagoon for disposal.

Caution should be exercised as spilled materials can migrate under snow cover for considerable distances and not be visible from above.

6.1.5 Material Removal

Removal of the spilled sewage may be accomplished using several techniques depending on the nature of the spill. Generally, methods used include suction, mechanical removal and the application of absorbent material.

Suction methods may be used initially if there is a significant quantity of free product on the ground. Equipment used to recover material in this fashion may include vacuum trucks, portable pumps or shop vacuums.

Suction screens may be required to prevent hose plugging and possible pump drainage.

Mechanical recovery using hand tools or heavy equipment should be used to collect soils or other loose material contaminated by the sewage. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause a greater environmental impact from the operation of the equipment than from the spill itself.

Recovered liquids and saturated soils will be disposed of in the sewage lagoon.

6.2 Fuel and Gasoline Spills

Extreme caution should be exercised when containing and cleaning up spilled petroleum products due to high fire and explosion hazards associated with these materials.

Depending on the size of the spill and surrounding conditions, personal protective equipment such as rubber gloves (nitrile, neoprene, butyl rubber or PVC), rubber boots (neoprene or butyl rubber), chemical safety goggles and NIOSH/MSHA approved half mask respirators with organic vapor cartridges may be required. In poorly ventilated areas where there is the potential for vapors to concentrate, the use of heavy equipment should be carefully evaluated due to the potential explosion hazard.

6.2.1 Containment on Land

Containment of large volume fuel spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of the material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. This location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

6.2.2 Containment on Surface Water

As diesel fuels and gasoline are less dense than water, they will float on the surface. Spills of these materials to surface water bodies may be contained using booms and their floating devices.

In standing water, booms should be deployed to contain the floating material close to the shore, thereby facilitating contaminant recovery. If the water is flowing, the booms should be stretched across the width of the water surface and angled against the current to allow for shore side collection.

If the water is flowing through a drainage ditch or smaller stream, an underpass or water bypass dam should be constructed. An earthen dam is constructed to completely stop the flow of water. Piping is then installed to allow water to flow through below the level of the floating fuel. Alternately, a channel may be constructed to divert the water flow around the spill area. A dam should be constructed to contain the water the fuel has already entered.

Weirs constructed of sheet metal, plywood, etc. may be constructed to prevent material flow through culverts or ditches. The sheet is inserted into the stream to below the level of the fuel. The water flows under the weir and spilled material will collect at the surface for removal.

If commercial booms are not readily available, improvising booms can be constructed of virtually any material that will float and form a barrier, eg. logs, inflated fire hoses, etc. These materials may be used alone or, preferably, as supports for absorbent materials.

6.2.3 Containment on or Under Ice

Containment of spills on ice will be affected by the load bearing strength of the ice. If it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dyke should be lined with plastic to make it impermeable to the fuel. Water may be sprayed on snow dams/dykes to form an impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

If the spill penetrates the ice, containment becomes more difficult. If the water beneath the ice is standing, the ice will be broken to install a containment boom.

If the water is flowing slowly, ice slotting may be used. A trench is cut into the ice downstream of the spill and at an angle to the current to deflect and concentrate the spill. Spilled material that collects in the ice slot may be pumped out, absorbed or burned in place.

Vertical barriers, e.g. plywood sheets, may be inserted into the ice to deflect the movement of spilled material. Trenches should be cut in the ice at an angle to the direction of flow. The vertical barriers are inserted in the slots and allowed to freeze into place. The extent of the under ice spill may be monitored by boring observation holes into the ice with an auger.

6.2.4 Containment on Snow

Snow will readily absorb liquids, which may facilitate the removal of spilled material to a recovery or disposal site. Saturated contaminated snow may be collected relatively easily and hauled away. Compacted snow can be used to create an effective physical barrier to reduce the spread of spilled materials.

Several types of snow containment structures may be constructed to contain spilled material. Snow dykes and dams can be constructed and then lined with an impermeable liner or sprayed with water to form an impermeable ice layer. Initially the snow around the perimeter of the spill can be compacted, eg. with a snowmobile, to slow the movement of contaminants. The saturated snow can be collected with hand tools or heavy equipment and removed to the land fill for disposal or recovery.

Caution should be exercised as spilled material can migrate under snow cover for considerable distances and cannot be visible from above.

6.2.5 Fire or Explosion

The first step to be taken at a site where there is a fire or explosion risk, or if the material is on fire is to evacuate people from the surrounding area. Dykes or trenches are then constructed down slope of the spilled material to minimize spread of unburned liquids and/or the fire. The fire may then be extinguished using suitable methods and action may be taken to prevent further spillage, contain the material and begin clean-up procedures.

6.2.6 Material Removal

Removal of the spilled fuels may be accomplished using several techniques. Generally, methods used include suction, mechanical removal and the application of absorbent material.

Suction methods may be used initially if there is a significant quantity of free product on the ground or on the surface of a water body. Equipment used to recover material in this fashion may include vacuum trucks, portable pumps or shop vacuums.

Suction screens may be required to prevent hose plugging and possible dump damage.

Mechanical recovery using hand tools or heavy equipment should be used to collect soils or other loose material contaminated by the fuel. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause a greater environmental impact from the operation of the equipment than from the material itself.

Absorbents may be used to soak up petroleum product. They are commonly used for final clean-up, recovery of small amounts of fuel or to remove fuel from places which are inaccessible to other spill clean up methods. Snow and soil can be used as absorbent

material for a variety of petroleum products. The saturated absorbent can be collected mechanically and moved to a suitable disposal location.

Recovered liquids will be disposed of in accordance with appropriate GNWT regulations. Saturated soils and absorbents will be transported to the landfill for disposal

6.3 Chlorine Gas Leak

Chlorine is a very toxic gas. Appropriate personal safety equipment must be worn by personnel attempting to contain a leak. Two Class A response suites with Scott packs are located at the Fire Department for use in the event of a leak.

6.3.1 Containment and Disposal

Capping tools are available for sealing leaking cylinders. If a cylinder is capped successfully, it may be returned to the supplier for disposal. If the cylinder cannot be capped, remove the cylinder to a safe location downwind of any populated area and allow the gas to escape.

7.0 SPILL EQUIPMENT INVENTORY

7.1 Spill Equipment

The following is a listing of equipment owned by the City of Iqaluit that may be used in the event of a spill emergency. The usual location of the equipment is also indicated.

MUNICIPAL SPILL EMERGENCY EQUIPMENT	
EQUIPMENT	**STORAGE LOCATION**
5 Cat 950 Loaders	5 at the Municipal Garage
2 Rubber Tired Backhoe	2 at the Municipal Garage (outside)
2 Dump Trucks	2 at the Apex Parking Garage (winter) 2 at the Municipal Garage (non-winter)
1 Cat 814 Wheel Dozer	Municipal Garage (outside) / Air Base Garage (winter)
2 Road Graders	1 at Air Base Garage 1 at the Apex Parking Garage
1 Cat M322 Excavator with hammer	1 at the Municipal Garage (outside)
4 Sewage Trucks	4 at the Airbase Parking Garage
5 Water Trucks	1 at the Airbase Parking Garage 4 at the Apex Parking Garage
1 Cat 966 Loader	1 at the Municipal Garage

7.2 Resource Contact

The following is a listing of internal and external resources that may be contacted for aid in the event of a spill:

CONTACT	RESOURCE PROVIDED
Fire Department: Volunteers	Manpower, Trucks, Foam
Fire Department: Ambulance	Medical, Rescue Equipment
Fire Department: EMO	Evacuation, Rescue
24-Hour Spill Report Line	Expert Advice
External Contractors	Manpower, Equipment

8.0 TRAINING EXERCISES

Training and communication exercises should be carried on an annual basis to determine the actual readiness and ability of the City to handle a spill emergency. The exercises should be served to train key personnel and determine any weaknesses in the plan prior to the occurrence of an emergency situation. A variety of scenarios should be tested, eg. sewage spills from the force main, sewage lagoon dam failures, chlorine gas leaks, fuel spills, etc. to ensure that appropriate action can be taken quickly.
The Fire Department and the Emergency Measures Organization (EMO) currently conduct disaster training exercises in the City of Iqaluit. Neither of these groups target hazardous materials scenarios specifically, but a spill situation is often included as part of the larger exercise.
The Worker's Compensation Board will provide funding for employees to participate in hazardous materials courses if contact with hazardous materials is a component of the employee's job description. Courses available include Materials Safety Data Sheets (MSDS), Workplace Hazardous Materials Systems (WHMIS) and First Aid.

9.0 REFERENCES

Guidelines for Contingency Planning, Northwest Territories Water Board, January, 1987.

Spill Containment and Clean-up Course, Renewable Resources, Pollution Control Division, 1991.

Guidelines for the Preparation of Hazardous Material Spill Contingency Plan, Environmental Protection, Conservation and Protection, Environment of Canada, Western and Northern Region, Northwest Territories District Office, Yellowknife, NT, March 1990.

Contingency Planning and Spill Reporting in the NWT, A Guide to the New Regulations, Resources, Wildlife and Economic Development, Environmental Protection Service, 1993.

Spill Contingency Planning and Reporting Regulations, Environmental Protection Act, Government of the Northwest Territories, 1993.

Emergency Planning for Industry, CAN/CSA-Z731-95, Canadian Standards Association, 1995.

Sewage System Evaluation, Frobisher Bay, Final Report, F.J. Reinders and Associates Limited, October, 1982.

Iqaluit Sewage Lagoon Investigation – Preliminary Report, Ferguson Simek Clark, January, 1998.

Seepage from a Sewage Lagoon, What is a Reasonable Rate? – Draft Discussion Paper, Ferguson Simek Clark, January 1998.

The City of Yellowknife Spill Contingency Plan, October, 1993.

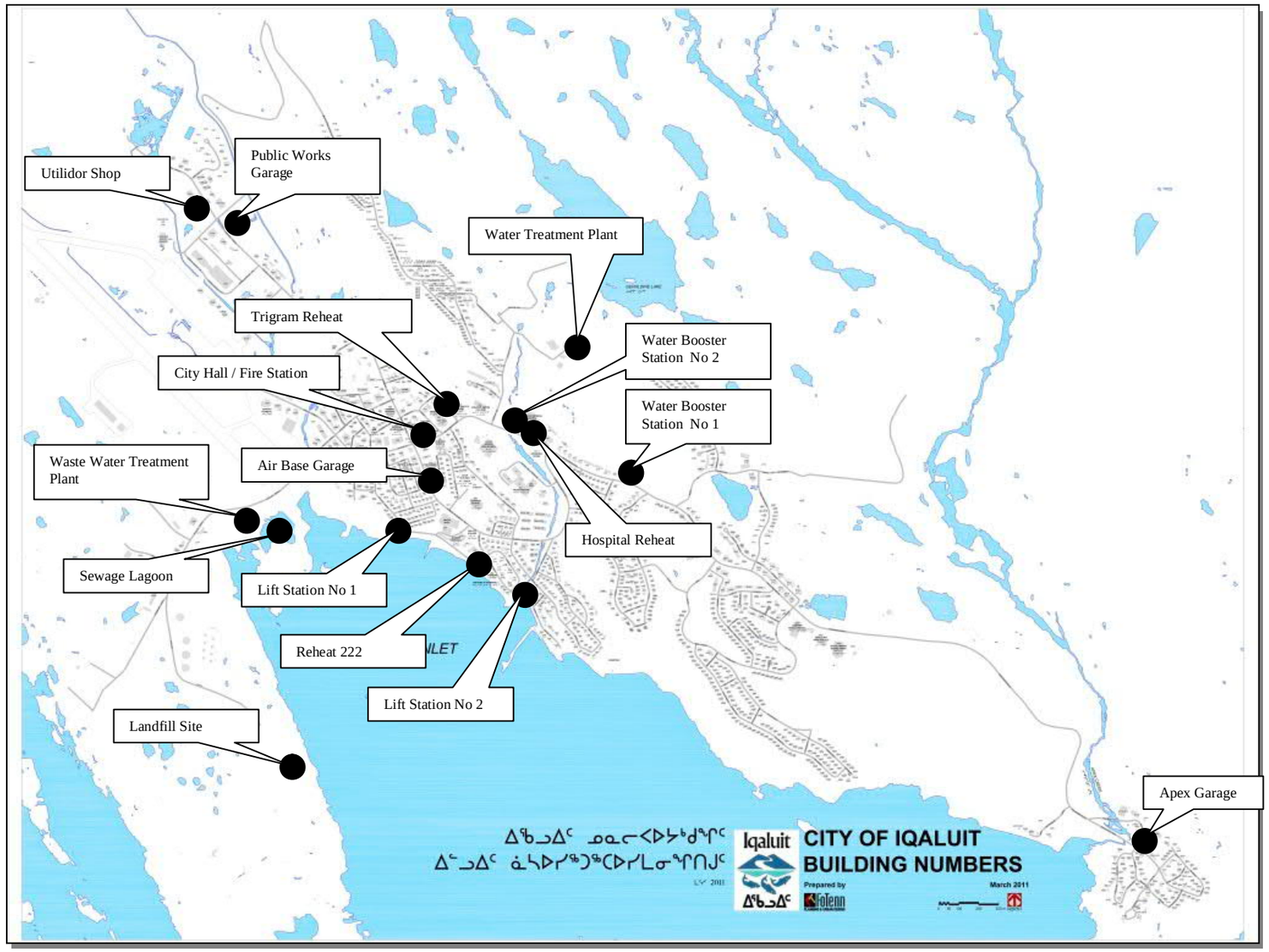
City of Iqaluit Spill Contingency Plan, Dillon Consulting Limited, 2004.

City of Iqaluit Sewage Life Station Spill Contingency Plan, Dillon Consulting Limited, 2003.

City of Iqaluit Sewage Lagoon Preparedness Plan, Dillon Consulting Limited, 2003.

APPENDIX A

CITY OF IQALUIT SITE PLAN


Utilidor Shop
Public Works Garage
Water Treatment Plant
Trigram Reheat
Water Booster Station No 2
City Hall / Fire Station
Water Booster Station No 1
Waste Water Treatment Plant
Air Base Garage
Hospital Reheat
Sewage Lagoon
Lift Station No 1
Reheat 222
Lift Station No 2
Landfill Site
Apex Garage
CITY OF IQALUIT
BUILDING NUMBERS
Iqaluit
Prepared by
March 2011

APPENDIX B

MATERIALS AND REPORTABLE QUANTITIES LIST (SAFETY DATA SHEETS)

SCHEDULE B

(*Section 9)*

ITEM NO.	TDGA CLASS	DESCRIPTION OF CONTAMINANT	AMOUNT SPILLED
1	1	Explosives	Any Amount
2	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 lt.
3	2.2	Compressed gas (non-corrosive, non flammable)	Any amount of gas from containers with a capacity greater than 100 lt.
4	2.3	Compressed gas (toxic)	Any amount
5	2.4	Compressed gas (corrosive)	Any Amount
6	3.1, 3.2, 3.3	Flammable Liquid	100 lt.
7	4.1	Flammable solid	25 kg
8	4.2	Spontaneously combustible solids	25 kg
9	4.3	Water reactant solids	25 kg
10	5.1	Oxidizing substances	50 lt. or 50 kg
11	5.2	Organic Peroxides	1 lt. or 1 kg
12	6.1	Poisonous substances	5 lt. or 5 kg
13	6.2	Infectious substances	Any amount
14	7	Radioactive	Any amount
15	8	Corrosive Substances	5 lt. or 5 kg
16	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 lt. or 50 kg.
17	9.2	Environmentally hazardous	1 lt. or 1 kg
18	9.3	Dangerous wastes	5 lt. or 5 kg
19	9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 lt. or 0.5 kg
20	None	Other contaminants	100 lt. or 100 kg

APPENDIX C

SEWAGE LIFT STATION – PUMP DATA

	Sewage Lift Station 1	Sewage Lift Station 2
Manufacturer	Gorman Rupp	Gorman Rupp
Model	T6A3S – B	T3A3S – B
Size	150 mm	75 mm
Impeller Diameter	314.3 mm	215.9 mm
RPM	1770	1160
Motor	30 HP	5 HP
Design Discharge	44 l/s	12.6 l/s
Head	17.7 m	11.6 m

APPENDIX D

SPILL REPORT FORMS