

MINTO EXPLORATIONS LTD.

YUKON TERRITORY
MINER BOARD

1997 MAY -7 P 12:00

REC'D BY Courier

APPL. NO QZ96-006

**MINTO PROJECT
YUKON**

SPILL CONTINGENCY PLAN

**QZ96-006
EXHIBIT 1.4**

Remember!

THE EMPHASIS MUST ALWAYS BE ON SPILL AVOIDANCE

Report any incident that may result in a spill.

SAFETY IS UP TO YOU

Remember that on any job, YOU are the key to safety. Good safety practices not only protect the workers around you - they are your own best protection.

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MINTO EXPLORATIONS LTD.

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YUKON**

SPILL CONTINGENCY PLAN

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SPILL CONTINGENCY PLAN

DISCOVERY OF A SPILL

In The Event A Spill Is Discovered:

Report the spill by any available means to the designated Spill Response Co-ordinator - this will trigger the INITIAL SPILL RESPONSE below. Be prepared to answer the following questions:

What materials are involved in the spill?

Any injury or risk of injury?

Any fire or fire hazard?

Any risk of an increase in the size of the spill? Contain the spill if possible!

Assist the Spill Response Co-ordinator as required. Complete the spill check list.

INITIAL SPILL RESPONSE

Determine:

Who is reporting the spill?

What materials are involved in the spill?

Any injury or risk of injury?

Any fire or risk of fire?

The location and extent of the spill and any action taken?

Notify:

Notify the designated Spill Response Co-ordinator on shift. The Senior Employee on shift will be the alternate to the designated Spill Response Co-ordinator.

The Spill Response Co-ordinator will have overall responsibility for the spill and may delegate certain responsibilities as required.

Mobilise:

The Spill Response Co-ordinator will assess the severity of the spill in order to determine an appropriate level of response and mobilise the Spill Response Team.

Is the environment endangered?

Are employees endangered?

Any fire or risk of fire?

Can the spill be confined?

Can the Spill Response Team cope with the spill?

Communicate:

The Spill Response Co-ordinator will alert the Spill Report Hotline and seek guidance and assistance, if required, as per the contact list on the reverse side of this check sheet.

Follow-up:

The Spill Response Co-ordinator will call out other employees not currently on shift and obtain additional services and equipment as required. The Spill Response Co-ordinator will also control access to the site of the spill and notify mine management and the corporate office of the spill.

A specific Spill Response Plan will be triggered by the nature and location of the spill.

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SPILL CONTINGENCY PLAN

COMMUNICATION

Spill Report Hotline Phone (403) 667-7244

A single contact for notification of spills in the Yukon is being manned on a 24-hour basis by Environment Canada.

In case medical assistance is required:

Hospital And Ambulance:
Ambulance - Carmacks Phone (403) 863-4444
Nursing Station - Carmacks Phone (403) 863-4444

In case of an explosives incident:

BXL Bulk Explosives Limited:
Emergency contact 24 hours per day Phone (403) 255-7776

If RCMP assistance is required:

Royal Canadian Mounted Police:
Pelly Crossing (Responsible for Minto) Phone (403) 537-5555
Carmacks Phone (403) 863-5555

In case of a forest fire:

Forest Fire Alert Phone 0 - Zenith 5555
or CB Channel 9

To notify the corporate office:

Minto Explorations Ltd:
H.L. Klingmann - President Phone(O) (604) 921-7570
Phone(H) (604) 921-8815
J. Proc - Project Manager Phone(O) (604) 921-7570
Phone(H) (604) 985-2534

To alert the Yukon Emergency Measures Organization:

Yukon Emergency Measures Organization:
Paul Albertson - Director Phone(O) (403) 667-5220

If mine rescue services are required:

Yukon Workers' Compensation Health And Safety Board:
General Phone (403) 667-5645
Fax (403) 668-2079
Naresh Prasad, Chief - Mine Engineering Phone(O) (403) 667-3777

The RCMP, the Yukon Ambulance System and Whitehorse General Hospital and vehicles and camps of the Yukon Community and Transportation Services are linked by the Yukon Government Enhanced Multi-Departmental Mobile Radio System, a VHF communication system. This system is accessible in an emergency.

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SPILL CONTINGENCY PLAN

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SECTION 1 - PURPOSE AND SCOPE

1.1 Purpose

An incident may result in a spill, either on the access road from the highway turnoff to the mine or at the mine.

An effective response to a spill will depend upon prompt action by properly equipped and trained personnel.

It is therefore the purpose of the **SPILL CONTINGENCY PLAN** (the **PLAN**) to provide the framework for such a response.

1.2 Scope

The **PLAN** is specifically focused on spills. Reference is made to other plans and programs instituted by the Company, e.g. and employee **SAFETY GUIDE** and an **MSDS GUIDE**. The focus of management effort is directed towards spill avoidance and this is covered in a number of programs and by numerous standard and documented operating procedures.

The areas covered by the **PLAN** are the access road from the highway to the mine including the barge and the Big Creek bridge plus the mine, mill, ancillary facilities and site services. The environmental sensitivities of this area have been reviewed with all employees.

Effective implementation of the **PLAN** is the key coping with a spill. Provision has therefore been made for familiarizing all employees with the **PLAN** as per **SECTION 12 - TRAINING** and for training a number of Spill Response Teams.

Provision has been made for regular reviews of the **PLAN** as per **SECTION 13 - PLAN MAINTENANCE AND DISTRIBUTION**.

Reference is made to various acts and regulations in **APPENDIX 4 - ACTS AND REGULATIONS** to provide information on the regulatory framework that exists in the Yukon.

1.3 "Inbound" Freight

The Company regularly purchases goods from a number of suppliers and these goods are delivered to the mine by truck. The most important products delivered are fuel such as gasoline, diesel fuel, and propane in bulk, ammonium nitrate in bulk, various lubricants and reagents in drums and packaged explosives (Class 1.1 and 1.5). **It is expected that on average two loads of freight will be delivered to the mine per day.**

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It is the policy of the Company, in its contractual arrangements with suppliers, to take possession of goods only upon delivery to the mine. It is further the policy of the Company to purchase goods only from suppliers who have the resources to respond to a spill and have filed Spill Contingency Plans under the Transportation of Dangerous Goods Act for designated substances. Therefore, although the Company will assist with communication and the clean-up of a spill which may occur along the access road between the highway turnoff and the mine, the Company will not assume liability for a spill which is the result of an incident which occurs before goods have been delivered to the mine.

1.4 "Outbound" Freight

The mine produces approximately 32, 000 t of copper concentrate per year. A description of the concentrate is given in **SECTION 9 - MSDS INFORMATION**. The concentrate is loaded into pots at the mine under the supervision of the mill leadhand on shift. Each pot holds approximately 12.5 t. The loaded pots are hauled by truck to Skagway in Alaska under contract with NEWCO. Responsibility for the concentrate is accepted by NEWCO once loading had been completed. **It is expected that on average two loads of concentrate will be hauled per day.**

NEWCO is responsible for notification and clean-up in case of a concentrate spill as per the Spill Contingency Plan filed by NEWCO. Therefore, although the Company will assist with communication and the clean-up of a concentrate spill which may occur along the access road between the mine and the highway turnoff, the Company does not accept liability for a spill which is the result of an incident which occurs after the truck has left the mine.

1.5 A Spill On Site

Current engineering standards have been used in the design and construction of the mill and ancillary facilities and site services. Detailed information is available in Maintenance Planning. The facilities will be monitored on a regular basis 24 hours per day and it is expected that a spill will be discovered, contained and the clean-up done relatively quickly.

1.6 Independent Audit

An independent audit will be performed once per year to ensure that the Spill Response Plan is current and that the necessary spill response training is being performed. This audit may be performed by a government agency. See also **SECTION 12 - TRAINING**.

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SECTION 2 - DISCOVERY OF A SPILL**2.1 In The Event A Spill Is Discovered:**

Report the spill by any available means to the designated Spill Response Co-ordinator or to the Senior Employee on shift. This will trigger the **INITIAL RESPONSE** as per **SECTION 3** of this **PLAN**.

Be prepared to answer the following questions and take initial action as follows:

- a. What materials are involved in the spill?
- b. Any injury or risk of injury?
- c. Any fire or fire hazard?
- d. Any risk of an increase in the size of the spill?
- e. Contain the spill if possible!

Assist the Spill Response Co-ordinator as required. Complete the Incident Report.

SECTION 3 - INITIAL SPILL RESPONSE**Determine:**

- Who is reporting the spill?
- What materials are involved in the spill?
- Any injury or risk of injury?
- Any fire or risk of fire?
- The location and extent of the spill and any action taken?

Notify:

Notify the designated Spill Response Co-ordinator on shift. The Senior Employee on shift will be the alternate to the designated Spill Response Co-ordinator.

The Spill Response Co-ordinator will have overall responsibility for the spill and may delegate certain responsibilities as required.

Mobilise:

The Spill Response Co-ordinator will assess the severity of the spill in order to determine an appropriate level of response and mobilize the Spill Response Team.

- Is the environment endangered?
- Are employees endangered?
- Any fire or risk of fire?
- Can the spill be confined?
- Can the Spill Response Team cope with the spill?

Communicate:

The Spill Response Co-ordinator will alert the Spill Report Hotline and seek guidance and assistance, if required, as per the contact list.

Follow-up:

The Spill Response Co-ordinator will call out other employees not currently on shift and obtain additional services and equipment as required. The Spill Response Co-ordinator will also control access to the site of the spill and notify mine management and the corporate office of the spill.

A specific Spill Response Plan will be triggered by the nature and location of the spill.

SECTION 4 - COMMUNICATION

4.1 Introduction

A recommended sequence of calls and key telephone numbers have been included in the instruction sheet included at the beginning of the **PLAN**. Contacts with phone and fax numbers are given in sub-section 4.2 in alphabetic order.

Hand-held radios are used for communication on site.

4.2 Telephone And Fax Numbers

BXL Bulk Explosives Limited: Emergency contact 24 hours per day	Phone	(403) 255-7776
Fisheries and Oceans: Habitat Biologist - Whitehorse	Phone	(403) 668-4611
Hospital And Ambulance: Ambulance - Carmack	Phone	(403) 863-4444
Nursing Station - Carmacks	Phone	(403) 863-4444
Indian and Northern Affairs: Forest Resources	Phone	(403) 667-3136
Resource Management Officer - Carmacks	Phone	(403) 863-5271
Forest Fire Alert	Phone	0 - Zenith 5555 or CB Channel 9
Minto Explorations Ltd: H.L. Klingmann - President	Phone(O)	(604) 921-7570
	Fax	(604) 921-9446
	Phone(H)	(604) 921-8815
J. Proc - Project Manager	Phone(O)	(604) 921-7570
	Phone(H)	(604) 985-2534
NorthwesTel: Information	Phone	411
Repair And Other Services	Phone	611
Poison Control - Whitehorse	Phone	(403) 667-8700
Rescue Co-ordination Centre - Air Search & Rescue	Phone	1-800-661-5631
Royal Canadian Mounted Police: Pelly Crossing (Responsible for Minto)	Phone	(403) 537-5555
Carmacks	Phone	(403) 863-5555

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Selkirk First Nation:

Pelly Crossing

Phone (403) 537-3331

Spill Report Hotline

Phone (403) 667-7244

A single contact for notification of spills in the Yukon is being manned on a 24-hour basis by Environment Canada (see **APPENDIX 2 - LETTER OF UNDERSTANDING**).

Trans North Air - Helicopter Service:

Carmacks

Phone (403) 863-5551

Whitehorse

Phone (403) 668-2177

Operations Manager - Whitehorse - Bob Cameron Phone (H) (403) 667-2760

Yukon Community and Transportation Services:

Chief Inspector - Dangerous Goods

Phone (403) 667-3032

Fax (403) 668-7864

Yukon Emergency Measures Organization:

Paul Albertson - Director

Phone (403) 667-5220

Yukon Workers' Compensation Health And Safety Board:

General

Phone (403) 667-5645

Fax (403) 668-2079

Naresh Prasad, Chief - Mine Engineering

Phone(O) (403) 667-3777

The RCMP, the Yukon Ambulance System and Whitehorse General Hospital and vehicles and camps of the Yukon Community and Transportation Services are linked by the Yukon Government Enhanced Multi-Departmental Mobile Radio System, a VHF communication system. This system is not accessible by the general public but access is available via one of the above entities in an emergency.

For information on dangerous goods in an emergency:

PHONE CANUTEC (613) 996-6666 COLLECT 24 HOURS PER DAY

or

PHONE 1-800-424-9300 24 HOURS PER DAY

(This is the CHEMTREC or Chemical Manufacturer's Association emergency number)

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SECTION 5 - RESPONSE ORGANIZATION

5.1 Response Organization

5.2 Other Employees

All employees not assigned to specific spill response duties or not directly involved with the spill, must remain at their assigned places of work.

5.3 Public Relations

The General Manager is the designated spokesman for the Company. The General Manager may delegate his responsibility for public relations if forced to do so by the scale of the incident.

The following are key elements of a public relations strategy:

- a. Provide information to the news media and the public on a timely basis.
- b. Co-ordinate the release of information with a release by a government official to avoid duplication and/or confusion. Inform the RCMP if necessary.
- c. Provide facts only.
- d. Avoid potentially controversial subjects.
- e. Ensure that next-of-kin have been informed before the name of an injured person or a casualty is released.

5.4 Responsibility Of The Safety/Training Manager

The Safety/Training Manager will ensure that various reports are completed and submitted in the time allowed. The Safety/Training Manager will also ensure that a full review of an incident is done as per sub-section 11.3 **In-house Report And Follow-up**.

SECTION 6 - MAPS AND PLANS

6.1 Maps

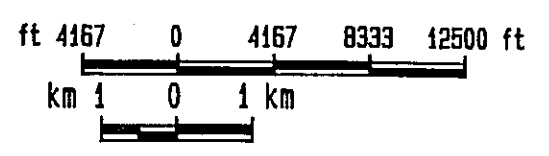
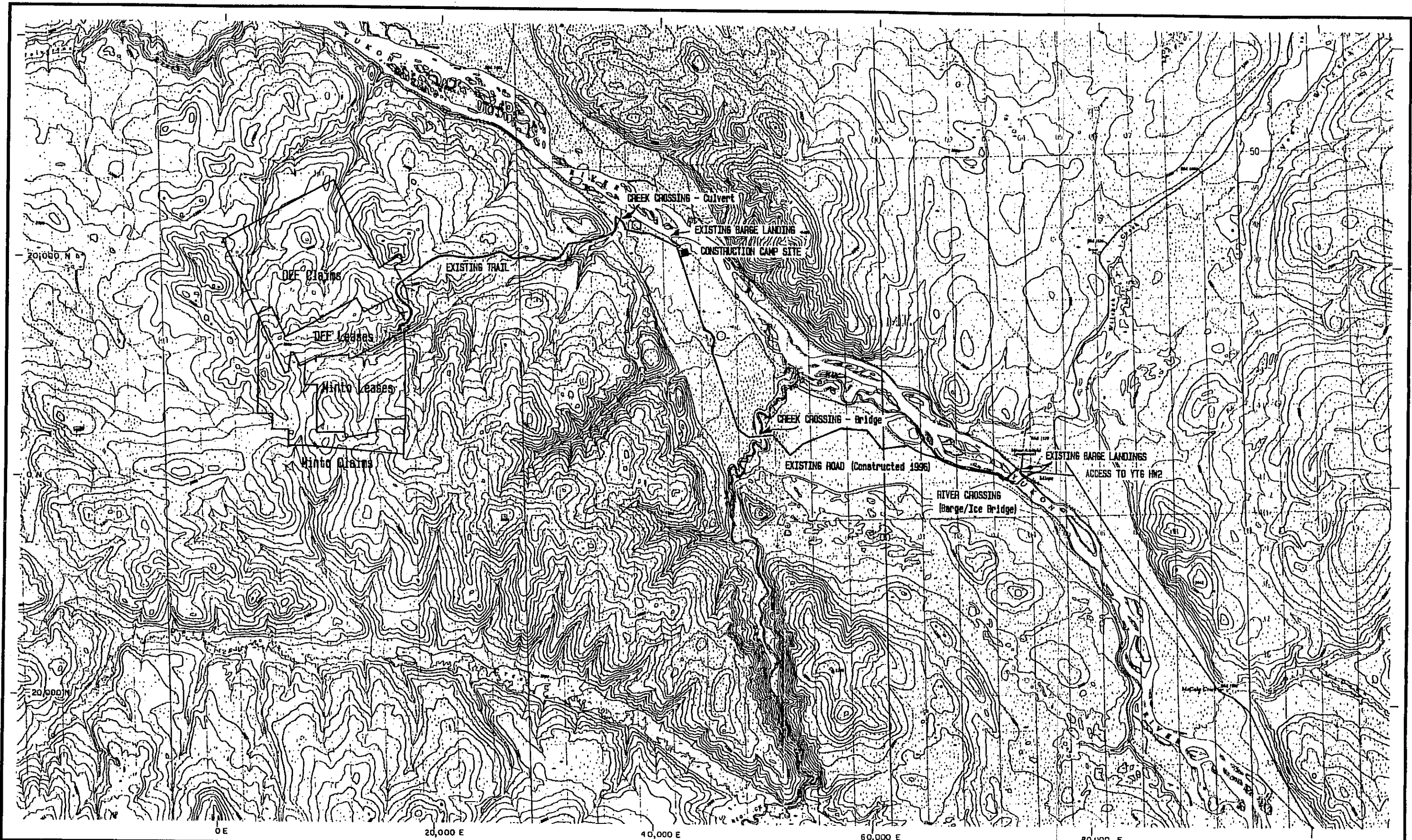
The location of the barge crossing, the Big Creek bridge, the access road to the mine and the mine are shown in Figure 6.1. The route followed by freight trucks to and from the mine has been highlighted.

The map also shows the Yukon River from McCabe Creek to Minto Creek. Note that the location and outline of sand bars in the river may change from year to year.

6.2 Plans

The site layout is shown in Figure 6.2.

Detailed information for the facilities such as the fuel tanks and equipment is available in Maintenance Planning.

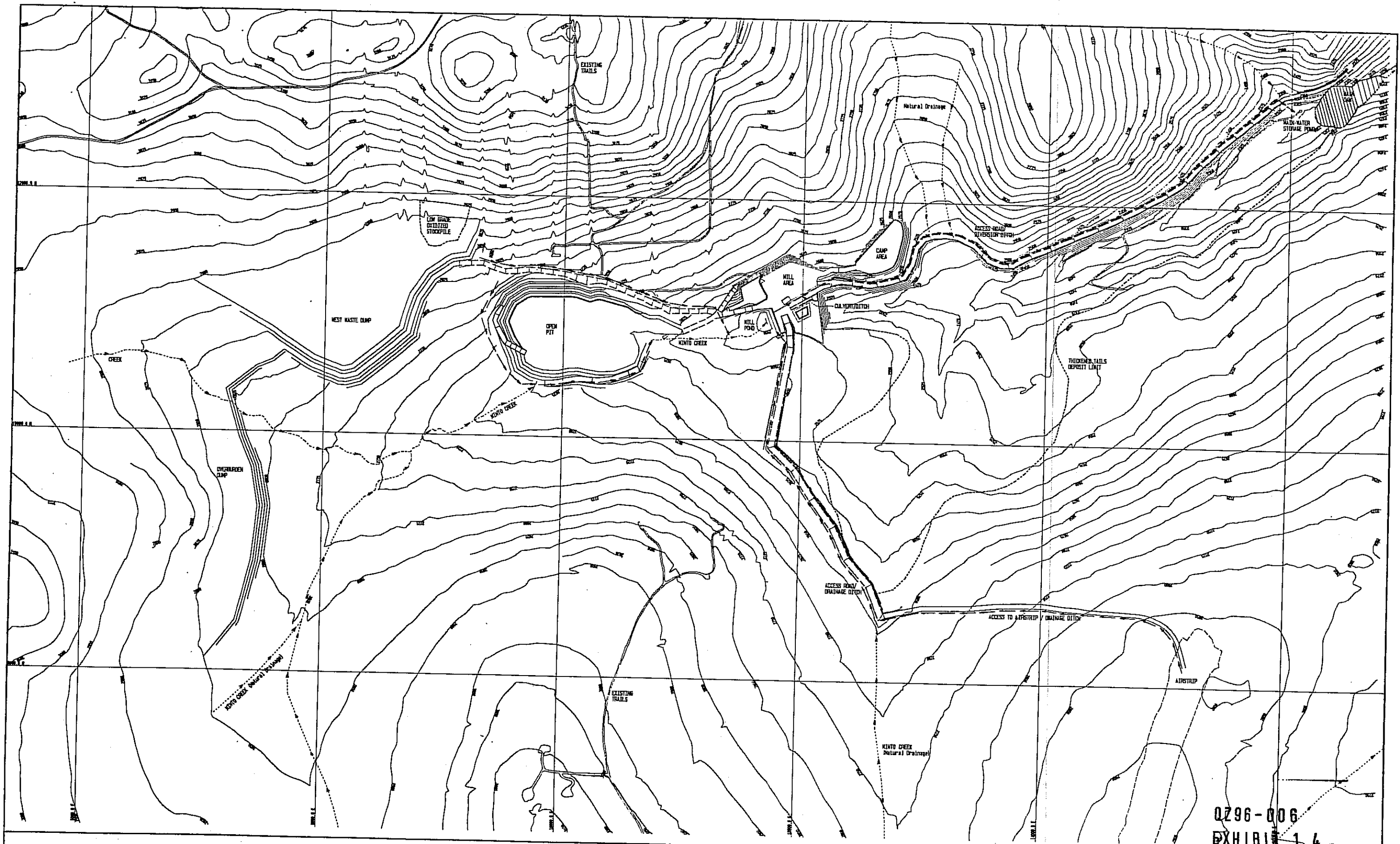


○ GRAVEL BORROW SITE

GENERAL LOCATION
YUKON, CANADA
Division: Whitehorse
Township: Carmacks

MINTO EXPLORATIONS LTD.	
MINTO PROJECT	
Proposed Access Road	
DATE: 97/02/10	DRAWING NO:
SCALE: 1: 100,000	296-006
Figure 6.1	

EXHIBIT 1 /



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REVISION	BY	DATE	MINTO EXPLORATIONS LTD.	
			MINTO PROJECT, Yukon	
			SITE DRAINAGE LAYOUT	
			PHASE AT END OF CONSTRUCTION	
			SCALE	1" = 50'
			DATE	07/02/96

SECTION 7 - RESPONSE STRATEGIES

7.1 Initial Response

The Spill Response Team, which consists of the designated Spill Response Co-ordinator plus 2 other employees on shift, is available for the initial response to a spill as per **SECTION 3 - INITIAL RESPONSE**. See also **SECTION 12 - TRAINING** for a comment on the Spill Response Teams.

The primary objective of the initial response is to ensure the safety of employees and to limit damage to the environment.

The fire hazard will be evaluated and the spill contained if possible with the resources immediately available until additional services and equipment can be mobilized as required.

A list of key contacts with telephone numbers is provided in **SECTION 4 - COMMUNICATION**.

A specific Spill Response Plan will be triggered by the nature and location of the spill as per **APPENDIX 1 - SPILL CONTAINMENT AND CLEAN-UP**.

7.2 Containment And Clean-up

Containment and clean-up are 2nd and 3rd steps in the Spill Response Plan.

The equipment and supplies available for containment and clean-up are detailed in **SECTION 9 - EQUIPMENT AND SUPPLIES**.

The containment and clean-up techniques used will depend upon the particular circumstances of the spill and a number of techniques may be required for a single spill. Guidelines for containment and clean-up are given in **APPENDIX 1 - CONTAINMENT AND CLEAN-UP**.

SECTION 8 - HEALTH AND SAFETY**8.1 Introduction**

Employees must abide by Company safety rules and standard practices and procedures and comply with the Occupational Health And Safety Act and Mine Safety Regulations of the Yukon Territory.

8.2 Personal Protective Equipment

- a. Wear approved boots or shoes with safety toes while at work. Laces must be tied.
- b. Wear a hard hat in the designated areas.
- c. Do not wear loose, baggy or ragged clothing when working around machinery. Long hair must be completely confined by a cap or net.
- d. Eye Protection:
 - Wear safety glasses when doing any work that might cause particles to fly such as during chipping or grinding.
 - Wear goggles or a faceshield when using the steamcleaner or compressed air for cleaning.
 - Wear goggles and/or a faceshield when handling reagents or where there is a risk of a chemical splash.
- e. Wear a dust mask when working in dusty conditions.
- f. Wear gloves when handling materials with sharp or jagged edges, wire rope or lumber.
- g. Use hearing protection when operating mobile equipment such as a loader or backhoe and in designated areas.
- h. Wear a safety belt and life line when doing work at heights.
- i. A ring can be dangerous - do not wear one at work.

THE CONDITION OF THE PERSONAL PROTECTIVE EQUIPMENT IS THE RESPONSIBILITY OF THE INDIVIDUAL EMPLOYEE

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8.3 Procedure In Case Of Injury

The first aid room is located in the first office trailer and is clearly marked. A first-aid kit and stretcher are available in EMERGENCY SUPPLIES.

First aid coverage is provided on all shifts.

In case of minor injury:

- a. Report injuries, no matter how slight, before the end of the shift on which the incident occurred.
- b. Have minor injuries examined and treated by the first aid attendant on shift and complete and sign the First Aid Record Book.

It is important to establish the fact that an injury is work-related to ensure that the injured person is covered by Workers' Compensation.

In case of serious injury:

- a. Protect the injured person from further injury. Do not expose YOURSELF to serious risk of injury to help the injured person.
- b. Do not move a severely injured person until a thorough examination has been made by a first aid attendant, unless there is a risk of further injury. If the injured person must be moved, drag the person in a horizontal position by grabbing clothes around the shoulders. If there is a danger of choking, grab the person by the armpits. Support the head. Always suspect fractures and never carry the injured person in your arms or on your back. This may aggravate existing injuries.
- c. Render first aid and obtain help as soon as possible.
- d. Have a stretcher, blanket and first aid kit brought to the scene of the incident.
- e. Make the injured person comfortable - keep warm and dry if possible.
- f. Transport the injured person to the hospital as soon as possible. It may be necessary to bring a doctor to site under certain circumstances.
- g. Do not permit the injured person to walk around or to travel to the first aid room alone. All head injuries, apart from minor cuts, must be examined by a doctor.
- h. Where practical, leave the scene of an accident as undisturbed as possible until an investigation has been completed.

8.4 Procedure In Case Of A Fire

General

ALWAYS SOUND THE ALARM BEFORE ATTEMPTING TO EXTINGUISH A FIRE

If the fire can be controlled with equipment at hand, fight fire until help arrives and/or the fire has been extinguished. If the fire cannot be controlled with available equipment, retreat to a safe place.

Type Of Fire

A fire may be classed into one of four general categories depending upon the medium required to extinguish the fire.

Class A Fire - fire in wood, paper, rags or similar materials. Use water or dry chemical to extinguish the fire.

Class B Fire - fire in gasoline, oil, grease, paints, thinner and similar flammable liquids. Use a dry chemical, carbon dioxide or foam to extinguish the fire. Do not use water on a Class B fire as this will tend to spread the fire.

Class C Fire - fire in or near electrical equipment. Use a non-conducting medium such as a dry chemical or carbon dioxide to extinguish the fire. Foam and water are good conductors of electricity and must not be used.

Class D Fire - fire in combustible metals such a magnesium, titanium, zirconium, lithium or sodium.

Fire Extinguishers

NEVER MISUSE FIRE FIGHTING EQUIPMENT

Fire extinguishers are located in the mill, workshop/warehouse, offices, camp and are mounted on all mobile equipment. Additional fire extinguishers are available in EMERGENCY SUPPLIES.

The label on a fire extinguisher shows for which class of fire the extinguisher is suitable. Note the time it will take to discharge the extinguisher. For an American La France dry chemical 5 lb extinguisher, approximately 60 seconds.

The following general rules apply:

- a. Do not tamper with the seals on fire extinguishers.

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- b. Use fire extinguishers in an upright position.
- c. Discharge the extinguisher initially approximately 2.5 m from the fire with the flow of air from behind if possible.
- d. With a dry chemical extinguisher - attack the base of the fire with a rapid, side-to-side motion.
- e. With a carbon dioxide extinguisher - attack the base of the fire and sweep the flame off the burning surface with a slow, side-to-side motion.
- f. Return empty fire extinguishers or extinguishers that have lost their charge to the warehouse for filling and/or recharging. Obtain a fully charged fire extinguisher and replace.

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8.5 Small Boat Safety And Cold Water Survival

General do's and don'ts

- a. Always wear an approved life vest or approved personal flotation device when travelling in a boat on the Yukon River.
- b. Overloading a boat is dangerous.
- c. Do not stand up when starting an outboard motor.
- d. Do not stand up or change seats in a small boat, particularly when it is fully loaded. If it is necessary to move, crouch low, keep weight on the centreline and hold on to both gunwales.
- e. Do not leave the tiller or steering wheel unattended when under way.
- f. When someone falls overboard:
 - i. Sound the alarm.
 - ii. Throw a buoyant object to assist the person in the water.
 - iii. Carefully manoeuvre to effect recovery.
 - iv. Be careful when assisting the person in the water - many would-be rescuers have been pulled into the water by the person in distress.
 - v. Always re-enter the boat over the stern and not over the side.

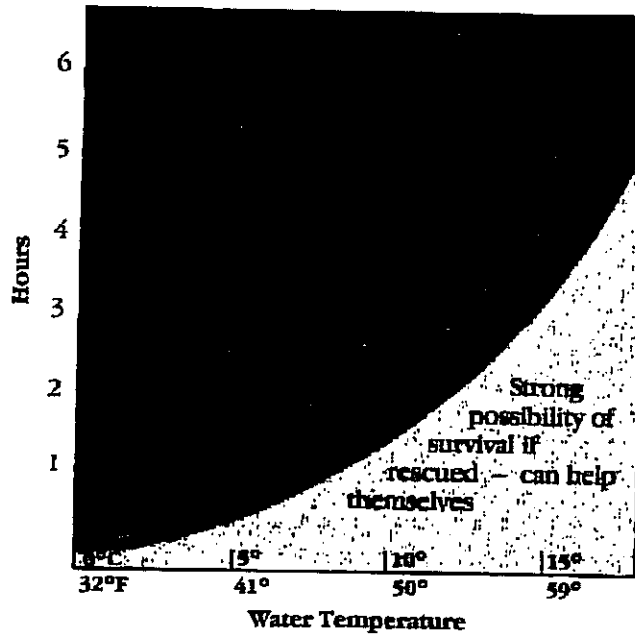
Life vests or personal flotation devices must have Department Of Transport approval.

Hypothermia

Hypothermia is the lowering of deep body or core temperature by loss of body heat. Once cooling begins, the body temperature falls steadily and unconsciousness can occur when the deep body or core temperature drops from the normal 37°C to approximately 32°C. Cardiac arrest is the usual cause of death when the core temperature falls below 30°C. Early symptoms of hypothermia are shivering, confusion and numbness in the hands and feet.

The estimated survival time for the average human being in water at different temperatures is shown in the figure below.

COLD WATER SURVIVAL CHART



The following do's and don'ts apply to a boating incident in cold water:

- Remain calm if faced with a cold water emergency.
- Consciously control breathing as much as possible.
- Support body, partially or completely, on some form of flotation device, for example the overturned boat, if possible.
- Do not swim to keep warm. Swim to shore if possible. Note however that the average person can swim only 1/10 the distance in cold water that the person could normally swim in warm water before being overcome by hypothermia.
- Tread water if not wearing a life vest.
- Adopt the HELP position if necessary as shown below:

● HELP (Heat Escape Lessening Position)



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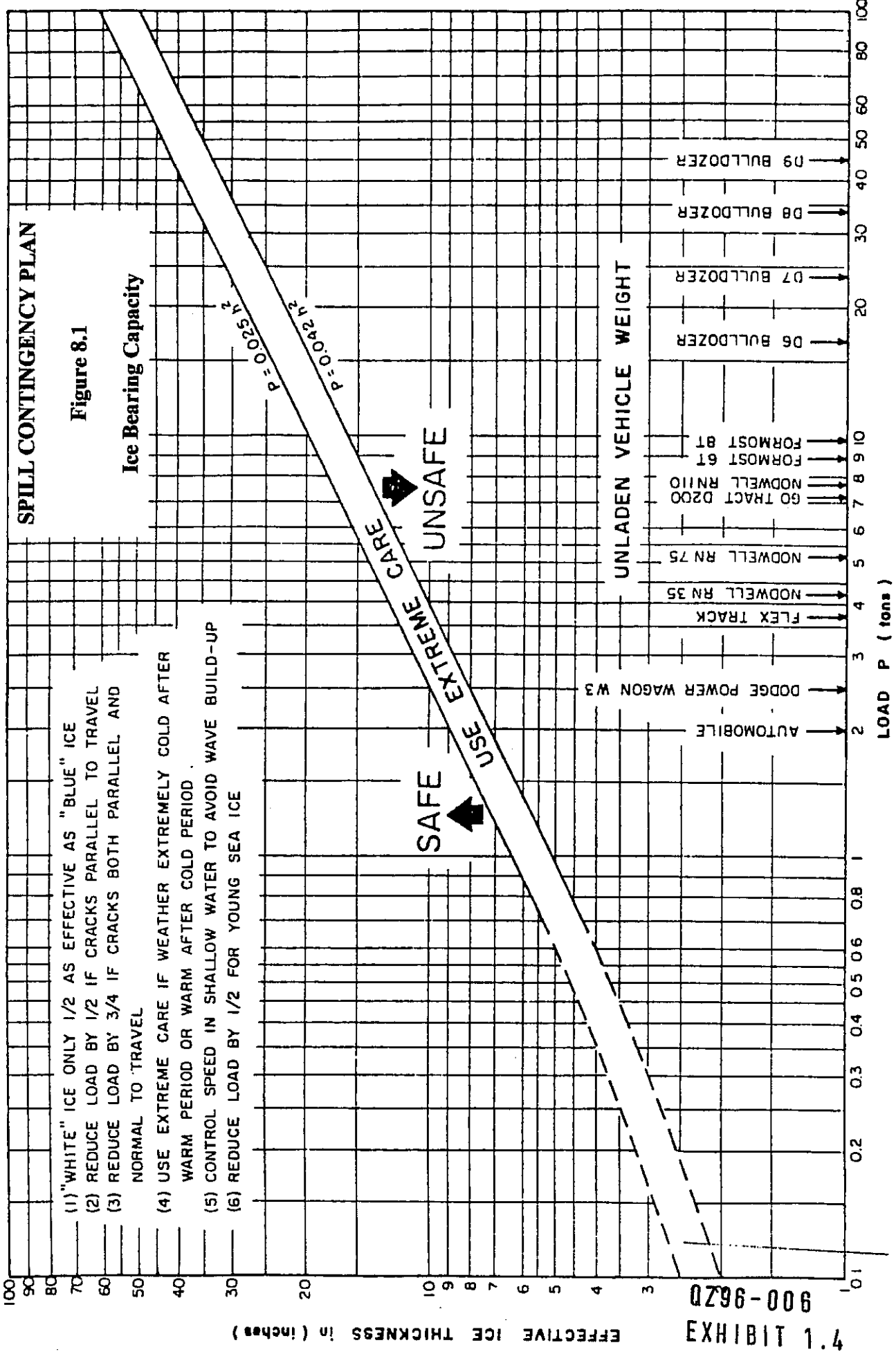
8.6 Ice Bridge

The ice bridge is used for crossing the Yukon River during the winter months. Refer to the **SAFETY GUIDE FOR THE CONSTRUCTION AND USE OF AN ICE BRIDGE**.

The Company's road maintenance crew is responsible for the maintenance of the ice bridge. The ice bridge has been clearly marked with flagging and warning signs. The bridge is being checked daily and will be closed to traffic if it is considered to be unsafe. Do not use the ice bridge if it has been closed to traffic. A ice bearing capacity chart is shown in **Figure 8.1**.

ALWAYS USE THE "BUDDY SYSTEM" WHEN DOING WORK ON ICE

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- (1) "WHITE" ICE ONLY 1/2 AS EFFECTIVE AS "BLUE" ICE
- (2) REDUCE LOAD BY 1/2 IF CRACKS PARALLEL TO TRAVEL
- (3) REDUCE LOAD BY 3/4 IF CRACKS BOTH PARALLEL AND NORMAL TO TRAVEL
- (4) USE EXTREME CARE IF WEATHER EXTREMELY COLD AFTER WARM PERIOD OR WARM AFTER COLD PERIOD
- (5) CONTROL SPEED IN SHALLOW WATER TO AVOID WAVE BUILD-UP
- (6) REDUCE LOAD BY 1/2 FOR YOUNG SEA ICE

EXHIBIT 1.1
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SECTION 9 - EQUIPMENT AND SUPPLIES

9.1 Emergency Supplies

The location of two containers with emergency supplies is show in **Figure 6.1**. Both containers contain the supplies shown in **Table 9.1**. Emergency supplies are also available at the mine in **EMERGENCY SUPPLIES**.

It is the responsibility of the Safety/Training Manager to check the contents of the containers and **EMERGENCY SUPPLIES** once per month and to replace items that have been used or are missing.

9.2 Equipment Available At The Mine

A list of the equipment available at the mine is shown in **Table 9.2**.

9.3 Equipment Available In Carmacks

The Emergency Measures Organization has an Emergency Resource Location in Carmacks (See also **APPENDIX 3 - EMERGENCY MEASURES ORGANIZATION** for a description of the organization, a map showing the Emergency Resource Locations in the Yukon and a full description of the equipment available in Carmacks):

Carmacks EMO - Tyrone Mogenson - Phone: (403) 863-5321 (Highways Dept.)
or (403) 863-5194 (H)

Oil spill response kit
Water rescue equipment
Jaws of life

A partial list of the support equipment available in Carmacks is shown in **Table 9.3**.
Contact:

Burdoe Enterprises - Ken Roberts
Box 96, Carmacks Y0B 1C0
Phone: (403) 863-6301 or Minto Channel 2M-3192

9.4 Lifting Equipment Available In Whitehorse

Heavy lifting equipment (40 ton truck-mounted crane) is available in Whitehorse as follows:

General Waste Management - Glen Mickey
175 Alsek Road, Whitehorse Y1A 4L8
Phone: (403) 668-4004 or (403) 668-4040 for a 24-hour emergency contact.

9.5 Boats And A Barge

Boats are available at Minto Landing during the summer months. Contact:

Pristine River Runs - Heinz Sauer
Box 127, Carmacks Y0B 1C0
Phone: Minto Channel 2M4551

A barge, capable of carrying loads up to 50 t, is available on the Yukon River during the summer months. Contact:

Jacobs Industries Ltd.
4269 - 4 th Avenue, Whitehorse Y1A 1K5
Phone: (403) 667-7606
Fax : (403)667-7604

To do water quality analyses:

Analytical Service Laboratories Ltd.
1988 Triumph Street, Vancouver, B.C. V5L AK5
Phone: (604) 253-4188; Fax: (604) 253-6700

Quanta Trace Laboratories Inc.
401-3700 Gilmore Way, Burnaby, B.C. V5G 4M1
Phone: (604) 438-5226; Fax: (604) 436-0565

A comprehensive source of information for equipment and services available in the Yukon with the necessary phone and fax numbers is THE YUKON MINER'S DIRECTORY. A copy is available in the warehouse or in EMERGENCY SUPPLIES.

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Table 9.1**Supplies Available In Containers 1 And 2**

The following supplies are available in containers 1 and 2:

Empty drums	2
Work gloves - pairs	4
Mitts - pairs	4
Respirators	2
Rope - coils	1
Tape - random colours and lengths	3
Surveyors stakes - bundles	2
Flashers	2
Safety vests with reflective tape	2
Life vest	2
Safety harness	1
Shovels	2
Sledge hammer	1
Fire extinguishers - 5 lb	2
Fire extinguishers - 10 lb	2
Oil Spill Response Kit	1

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Table 9.2

Equipment Available At The Mine

The following equipment is available at the mine:

Utility loader	1
Grader	1
Hiab truck	1
Forklift	1
Water truck/sand truck	1
Backhoe	1
Pickup trucks	5
Ambulance	1
Crew bus	1
Emergency lighting	2

Miscellaneous tools and equipment such as a chainsaw and an ice auger are available in the tool crib.

The following mining equipment is available at the mine:

Loader	1
Dozer	1
Haulage trucks	4

Emergency response equipment is available in EMERGENCY SUPPLIES.

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Table 9.3

Equipment Available In Carmacks

The following equipment is available in the Village of Carmacks:

PART F
VILLAGE OF CARMACKS RESOURCE LIST

RESOURCE - COMMUNICATION	LOCATION
2 - 4441 BAND RADIOS	KANDO ENTERPRISES
TELEPHONE	CARMACKS HOTEL
FAX	CARMACKS HOTEL
COMPUTER C/W MODEM	CARMACKS HOTEL
PHOTOCOPIER	CARMACKS HOTEL
MOBILE RADIOS FOR EQUIPMENT	YTG HIGHWAYS
2 - HAND HELD RADIOS	YTG HIGHWAYS
4 TELEPHONES	TANTALUS SCHOOL
FAX	TANTALUS SCHOOL
2 PHOTOCOPIERS	TANTALUS SCHOOL
INTERCOM	TANTALUS SCHOOL
PORTABLE P. A.	TANTALUS SCHOOL
LARGE VARIETY OF APPLE COMPUTERS	TANTALUS SCHOOL
COMPUTER MODEM	TANTALUS SCHOOL
T. V. SATELLITE DISH	TANTALUS SCHOOL
FAX	VILLAGE OF CARMACKS OFFICE
2 LINE TELEPHONE	VILLAGE OF CARMACKS OFFICE
3 - MACINTOSH COMPUTERS	VILLAGE OF CARMACKS OFFICE
3 - HAND HELD RADIOS, LOCAL DROP & LINK REPEATERS	SAR TEAM
2 - HAND HELD RADIOS + 15 PAGERS	VOLUNTEER FIRE DEPT.
3 - HAND HELD RADIOS	VILLAGE OF CARMACKS
1 - BASE RADIO	VILLAGE OF CARMACKS
2 LINE TELEPHONE	NORTHERN AFFAIRS
FAX	NORTHERN AFFAIRS
COMPUTER C/W MODEM	NORTHERN AFFAIRS
1 - BASE RADIO	NORTHERN AFFAIRS
13 - TR/RC PORTABLE RADIOS	NORTHERN AFFAIRS
4 - SBX-11 PORTABLE RADIOS	NORTHERN AFFAIRS
2 RADIO MONITORS	NORTHERN AFFAIRS
2 - CB RADIOS	NORTHERN AFFAIRS
1 - MDMRS RADIO	NORTHERN AFFAIRS
2 LINE TELEPHONE	HEALTH CENTRE
1 LINE TELEPHONE	HEALTH CENTRE
FAX	HEALTH CENTRE
1 - INTERCONNECT PORTABLE RADIO	HEALTH CENTRE
5 - PORTABLE MDMRS RADIOS	AMBULANCE SERVICE
6 - VHF PORTABLE RADIOS	AMBULANCE SERVICE
RESOURCE - SHELTER	LOCATION
SCHOOL BUILDING (ATTACHED FLOOR PLAN)	TANTALUS SCHOOL
C/W AUXILIARY ELECTRICAL POWER UNIT,	
8 TOILETS, 2 SHOWERS, 3 STOVES,	
3 FRIDGES, 2 MICROWAVE OVENS, 1 WASHER	
1 DRYER	
10'X32' BUNKHOUSE	BERDOF ENTERPRISES

Table 9.3
Continued
Equipment Available In Carmacks

RESOURCE - SHELTER CONT'D	
8'X16' OFFICE TRAILER	BERDOE ENTERPRISES
HOTEL - 41 ROOMS	CARMACKS HOTEL
CAMPGROUND C/W 4- 16'X16' TENT FRAMES	CARMACKS HOTEL
6 - 16'X16' WALL TENTS	CARMACKS HOTEL
1 - 14'X16' CANVAS WALL TENT	KANDO ENTERPRISES
1 - 12'X14' CANVAS WALL TENT	KANDO ENTERPRISES
COMMUNITY HALL, CURLING RINK, ADMINISTRATION BUILDING, GARAGE, POOL, FIRE HALL + EMO STORAGE, C/W 1000 GALLON WATER STORAGE TANK	VILLAGE OF CARMACKS
FORESTRY BUILDINGS	
2 - FORESTRY TOWERS	NORTHERN AFFAIRS
13 - 12'X14' AND 14'X16' TENTS	NORTHERN AFFAIRS
HEALTH CENTRE C/W 1 BED, 1 EXAM TABLE	NORTHERN AFFAIRS HEALTH CENTRE
RESOURCE - SOCIAL ASSISTANCE	LOCATION
GENERAL STORE C/W GROCERIES, DELI, HARDWARE, BAKERY, LIMITED CLOTHING, GAS, OIL & DIESEL	TATCHUN CENTRE
PERSONNEL, REGISTRATION & INQUIRY CARDS, YTG - HEALTH & HUMAN RESOURCES	
RECEPTION CENTRE KIT, EMERGENCY FEEDING STATION	
50 SEAT RESTAURANT	CARMACKS HOTEL - GOLD PANNER
FIRST AID SUPPLIES	SAR TEAM
2 PATIENT ROAD AMBULANCE	AMBULANCE SERVICE
RESOURCE - MOBILE EQUIPMENT	LOCATION
DB 46A CAT C/W S BLADE & STRIPPER	KANDO ENTERPRISES
D7 17A CAT C/W ANGLE BLADE & WINCH	KANDO ENTERPRISES
225 CAT EXCAVATOR WITH 1.5 YARD BUCKET AND FROST TEETH	KANDO ENTERPRISES
RUBBER TIRE BACKHOE/LOADER C/W 4 WHEEL DRIVE & 22' REACH	KANDO ENTERPRISES
3 - 4X4 TRUCKS	
TANDEM AXLE TRAILER C/W 20' DECK	KANDO ENTERPRISES
2 - LOADERS	KANDO ENTERPRISES
3 - GRADERS	YTG HIGHWAYS
WATER TANKER TRAILER	YTG HIGHWAYS
HIGH BOY TRAILER	YTG HIGHWAYS
SNOWBLOWER	YTG HIGHWAYS
BACKHOE	YTG HIGHWAYS
920 CAT LOADER C/W BUCKER, FORKS & JIB	CARMACKS HOTEL
4X4 TRUCK	CARMACKS HOTEL
TRI AXLE FIFTH WHEEL TRAILER (20,000 LBS)	CARMACKS HOTEL
36' TANDEM AXLE TRAILER	CARMACKS HOTEL
TANDEM DUMP TRUCK - 10 TON	NORDENSKIOLD RIVER BACKHOE
CEMENT TRUCK - 8 YARDS	NORDENSKIOLD RIVER BACKHOE
LOADER	NORDENSKIOLD RIVER BACKHOE
BACKHOE	NORDENSKIOLD RIVER BACKHOE
FORK LIFT	NORDENSKIOLD RIVER BACKHOE
3 GRAVEL TRUCKS - RADIO EQUIPPED	BERDOE ENTERPRISES

Table 9.3
Continued
Equipment Available In Carmacks

RESOURCE - MOBILE EQUIPMENT CONT'D

TRACTOR C/W LOWBOY TRAILOR	BERDOE ENTERPRISES
950 RUBBER TIRE LOADER	BERDOE ENTERPRISES
930 RUBBER TIRE LOADER	BERDOE ENTERPRISES
D7 CAT	BERDOE ENTERPRISES
740 GRADER	BERDOE ENTERPRISES
2 - 4X4 PICK UPS	BERDOE ENTERPRISES
RAMROD SKID STEER LOADER	BERDOE ENTERPRISES
SUBURBAN	BERDOE ENTERPRISES
1 TON TRUCK (RADIO EQUIPPED)	VILLAGE OF CARMACKS
1/2 TON TRUCK (RADIO EQUIPPED)	VILLAGE OF CARMACKS
1 4X4 SUBURBAN C/W WINCH	SAR TEAM
JET RANGER HELICOPTER	TRANS NORTH AIR
2 FIRE TRUCKS (RADIO EQUIPPED)	VOLUNTEER FIRE DEPT.
4X4 SUBURBAN	HEALTH CENTRE
1 WHEELCHAIR	HEALTH CENTRE
2 SPINAL CARE TRANSFER BOARDS	HEALTH CENTRE
4 PORTABLE STRETCHERS	HEALTH CENTRE
1 - 5 STAR SLEEPING BAG	HEALTH CENTRE
6 - OXYGEN BOTTLES	HEALTH CENTRE
3/4 TON 4X4 TRUCK	NORTHERN AFFAIRS
3/4 TON TRUCK	NORTHERN AFFAIRS
2 - SNOWMOBILES	NORTHERN AFFAIRS

RESOURCE - ALL TERRAIN VEHICLES

2 - 4WD ATV	LOCATION
ATV C/W 4 WHEEL DRIVE & WINCH	BERDOE ENTERPRISES
	KANDO ENTERPRISES

RESOURCE - BOATS

14' ALUMINUM C/W 20 H.P. MOTOR	LOCATION
14' ALUMINUM CANOE	KANDO ENTERPRISES
15 - 17' CANOES C/W 6 & 30 UNIT TRAILERS	KANDO ENTERPRISES
2- 32' CABIN RIVER BOATS C/W TRAILER	CARMACKS HOTEL
19' CABIN CRUISER C/W TRAILER	CARMACKS HOTEL
16' BOAT C/W RESCUE LINES & HOOK	CARMACKS HOTEL
2 - FLOTATION COATS, 2 - FLOTATION SUITS	SAR TEAM
18' CANOE C/W 15 HP MOTOR	SAR TEAM
1 - BOAT TRAILER	NORTHERN AFFAIRS
16' BOAT WITH 45 HP MOTOR	NORTHERN AFFAIRS
12' BOAT WITH 9.5 HP MOTOR	BERDOE ENTERPRISES
	BERDOE ENTERPRISES

RESOURCE - MISC. EQUIPMENT

POWER SAW, SHOVELS, SLEDGE HAMMERS, CROW BAR	LOCATION
MISC. POWER & HAND TOOLS	CARMACKS HOTEL
LADDERS	CARMACKS HOTEL
HOT & COLD FOOD TABLES, POTS, PANS, DISHES ETC., FOR 50	CARMACKS HOTEL
PORTABLE 300,000 BTU DIESEL HEATER	CARMACKS HOTEL

Table 9.3
Continued
Equipment Available In Carmacks

RESOURCE - MISC. EQUIPMENT CONT'D	
2" PORTABLE PUMP, LUMBER, NAILS	CARMACKS HOTEL
3 - PORTABLE H.D. ELECTRIC CONSTRUCTION HEATERS	CARMACKS HOTEL
PORTABLE AIR COMPRESSOR C/W NAILER	CARMACKS HOTEL
2 - 20 LBS. PROPANE TANKS	CARMACKS HOTEL
12 - EMPTY 45 GAL. DRUMS	CARMACKS HOTEL
LUMBER & NAILS	CARMACKS HOTEL
2 - 100 LBS. PROPANE TANKS	CARMACKS HOTEL
3 - SNOWMOBILES	KANDO ENTERPRISES
2 - 100 GAL. TIDY TANKS	KANDO ENTERPRISES
200 GAL. TIDY TANK	KANDO ENTERPRISES
4" WATER PUMP	BERDOE ENTERPRISES
3" WATER PUMP	BERDOE ENTERPRISES
7.5 KW LIGHT PLANT	BERDOE ENTERPRISES
2 - SNOWMOBILES	BERDOE ENTERPRISES
ELECTRIC FUEL PUMP	KANDO ENTERPRISES
HAND FUEL PUMP	KANDO ENTERPRISES
300 AMP WELDER	KANDO ENTERPRISES
300 AMP BUZZ BOX	KANDO ENTERPRISES
CUTTING TORCH & BOTTLES	KANDO ENTERPRISES
220 VOLT 5 HP AIR COMPRESSOR	KANDO ENTERPRISES
2 - POWER SAWS	KANDO ENTERPRISES
PROPANE TORCH	KANDO ENTERPRISES
4 - 100 LBS. PROPANE BOTTLES	KANDO ENTERPRISES
2 - 20 LBS. PROPANE BOTTLES	KANDO ENTERPRISES
6" WATER PUMP	KANDO ENTERPRISES
2" WATER PUMP	KANDO ENTERPRISES
40" CIRCULAR SAW MILL	KANDO ENTERPRISES
SHOP FULLY EQUIPPED WITH TOOLS	KANDO ENTERPRISES
MISC. POWER AND HAND TOOLS	VILLAGE OF CARMACKS
CHAIN SAW, ICE AUGER, PORTABLE PUMPS AND GENERATOR	VOLUNTEER FIRE DEPARTMENT
PHOENIX EXTRACTION DEVICE	
6 - SCBA DEVICES + 19 TANKS	VOLUNTEER FIRE DEPT.
15 - FULL TURN-OUT SUITS	VOLUNTEER FIRE DEPT.
RESCUE EQUIPMENT INCLUDING: ROPES, STRETCHERS	VOLUNTEER FIRE DEPT.
SEARCH EQUIPMENT INCLUDING: PACKS, TENTS, SLEEPING BAGS, STOVES, COOKWARE, BINOCULARS, COMPASSES ETC.	SAR TEAM
6 PAIRS OF SNOWSHOES	SAR TEAM
2 - PORTABLE HEATERS	NORTHERN AFFAIRS
2 PROPANE GRILLS	NORTHERN AFFAIRS
15 - MESS KITS	NORTHERN AFFAIRS
80 - SLEEPING BAGS	NORTHERN AFFAIRS
VARIOUS HAND TOOLS	NORTHERN AFFAIRS
7 - WOOD STOVES	NORTHERN AFFAIRS
6 - COLEMAN STOVES	NORTHERN AFFAIRS
8 - FIRST AID KITS	NORTHERN AFFAIRS
3 PAIRS OF SNOWSHOES	NORTHERN AFFAIRS
3 PAIRS OF BINOCULARS	NORTHERN AFFAIRS

Table 9.3
Continued
Equipment Available In Carmacks

RESOURCE - MISC. EQUIPMENT CONT'D
3 CS. FLARES
2 PORTABLE GENERATORS
FOREST FIRE EQUIPMENT:
15 PUMPS
240 LENGTHS - 100' HOSE
12 DELAY WATER TANKS

NORTHERN AFFAIRS
NORTHERN AFFAIRS
NORTHERN AFFAIRS

SECTION 10 - MSDS INFORMATION

10.1 General

See the **MSDS GUIDE** for detailed information and a complete list of MSDS sheets (The **MSDS GUIDE** has been prepared by the Company and is available to all employees).

Material Safety Data Sheets or **MSDS** is one of the three elements of the Workplace Hazardous Materials Information System (WHMIS). WHMIS came into effect in Canada on October 31, 1988 as a system that provides information to workers about the hazardous materials that are produced, handled, stored, used or disposed of in the workplace.

The three elements of WHMIS are:

Labels

All hazardous materials must carry labels that clearly identify risks and recommend precautions that should be taken for safe handling of the material.

Material Safety Data Sheets Or MSDS

An **MSDS** must be provided for every hazardous material used in the workplace. The **MSDS** gives more information about a particular material than can be put on a label.

ALWAYS READ THE MSDS BEFORE HANDLING AN UNKNOWN MATERIAL

Worker Education

It is the responsibility of the employer to train workers in the interpretation and use of the information which is provided on labels and the **MSDS**.

Enforcement of WHMIS in Yukon is the responsibility of Health and Safety Branch of the Yukon Workers' Compensation Health And Safety Board.

Note that the Transportation of Dangerous Goods Act (1992) and Regulations - TDG and WHMIS are complementary hazard communications systems.

CANUTEC is the Canadian Transport Emergency Centre located in Ottawa. It is operated by the Transport Dangerous Goods Protectorate of Transport Canada. CANUTEC provides an advisory service and is staffed 24 hours per day. For information call (613) 996-4624 if the information required is not for an emergency.

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10.2 List Of MSDS

The following MSDS have been included in **APPENDIX 5 - MSDS**:

10.2.1 Mill Reagents

Aerophine 3418A
Aero 5100
Aerofroth S-7304
Superfloc 1202
Aeropromoter S-6493
Sodium Sulphide - Na₂S

10.2.2 Fuel

Diesel fuel
Gasoline
Propane

10.2.3 Other

Ammonium nitrate - used as a blasting agent when mixed with diesel fuel (AN/FO)
Motor Oil

10.2.4 Copper Concentrate

A Health And Safety Data Sheet for Copper Concentrate is shown in **Figure 10.1**.

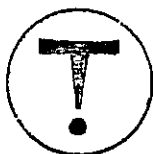
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FIGURE 10.1**HEALTH AND SAFETY DATA SHEET FOR COPPER CONCENTRATE****Section 1 - Product Identification**

Copper concentrate - typically a greenish-black powder; S.G.3.8.

Copper concentrate is a mixture of chalcopyrite and bornite in varying proportions plus minor amounts silica.

Solubility in water is low.

Section 2 - WHMIS Classification

WHMIS Class D-2A - Material causing other toxic effects.

Section 3 - Health Hazard Information

Do not ingest. Avoid breathing dust. Avoid contact with eyes and skin. Will emit toxic fumes of oxides of sulphur when heated to decomposition.

Section 4 - Protective Clothing

Safety glasses, coveralls, gloves, boots and dust mask are recommended. Use self-contained breathing apparatus to enter a confined space where there is a potential for oxygen deficiency.

Section 5 - Fire Hazard

Flammability - Dust is flammable when exposed to heat or flames. Concentrates can become hot under certain conditions of moisture and temperature and may ignite.

Fire Fighting Procedures - Use water spray or dry chemical to extinguish a fire.

Section 6 - General

Always practise good housekeeping when handling concentrates.

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SECTION 11 - REPORTING REQUIREMENTS

11.1 Requirement For A Spill Contingency Plan

The **SPILL CONTINGENCY PLAN** is required as a condition of the Type B Water Use Licence MS95-013 issued by the Yukon Territory Water Board on August 14, 1996.

11.2 In-house Reporting Requirements

Complete and submit an Incident Report to the Safety/Training Manager as per the attached form.

11.3 Report To The Yukon Territory Water Board

It is a requirement of the Water Licence that a detailed report be submitted to the Yukon Territory Water Board within 15 days of an incident. See #7 of the Licence.

11.4 In-house Follow-up

Use the Incident Report to document an incident in detail and submit to the Safety/Training Manager who will in turn do a detailed analysis of the incident with recommendations to the General Manager. The thrust of the recommendation must be corrective action that will be taken to ensure that an incident will not re-occur.

Analysis of incidents provides the basis for preventative action in the future and this is a key aspect of the ongoing review and training programs.

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SPILL CONTINGENCY PLAN

Incident Report

Complete This Report As Soon As Possible After The Incident Has Occurred

Date Of Incident: _____ Time Of Incident: _____

Location - Use Map: _____

Weather Conditions - Temperature: _____ Wind: _____

Rain: _____ Snow: _____ None: _____

Visibility - Good: _____ Poor: _____

Describe Incident: _____

Product Spilled: _____

Fire: _____ Action Taken: _____

Injury: _____ Action Taken: _____

Impacts: _____

Containment: _____

Who Was Notified: _____ Action Taken: _____

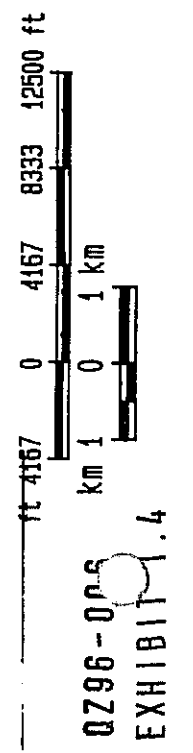
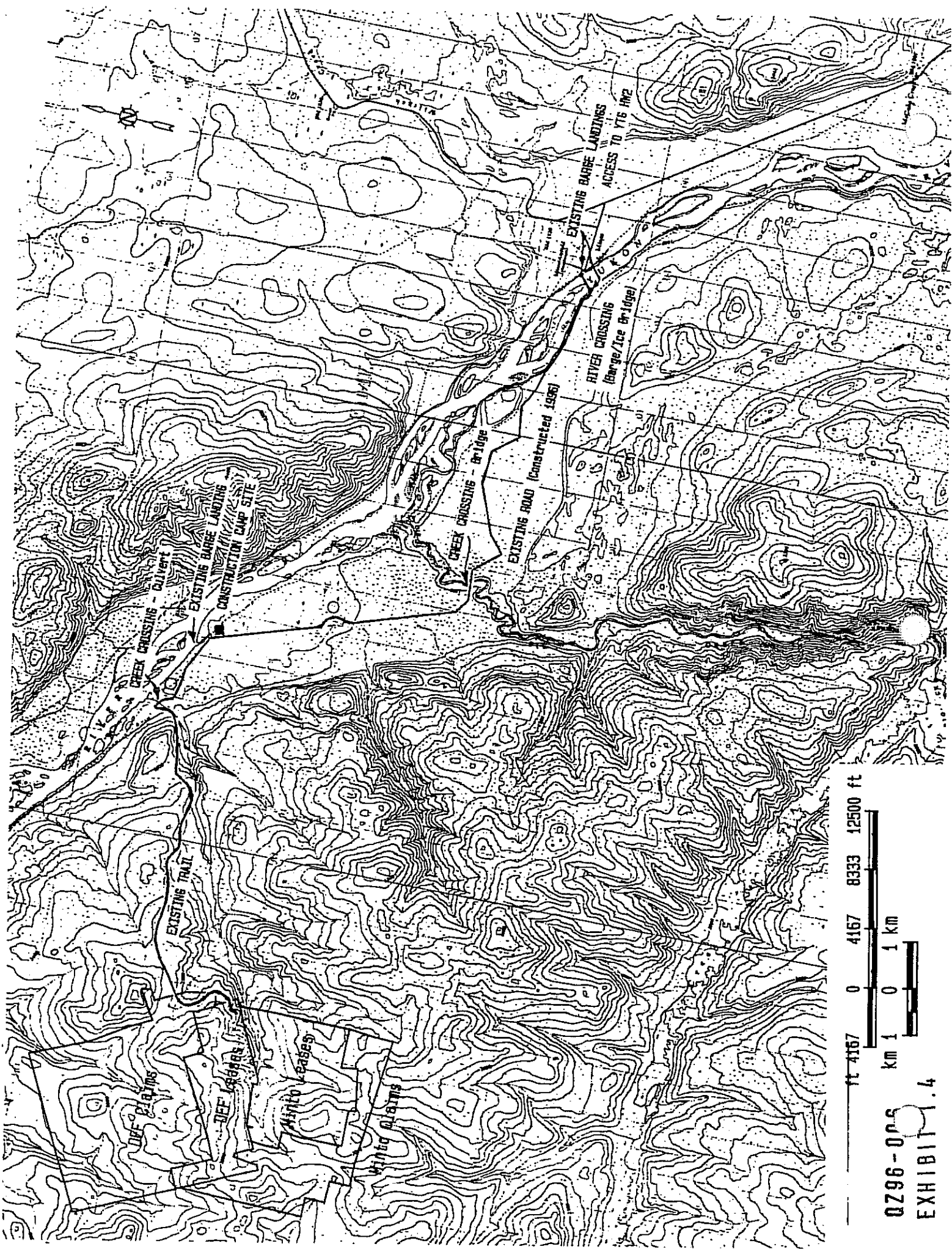
Cause Of The Incident: _____

General Comments: _____

Report Prepared By: _____ Date: _____ Time: _____

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EXHIBIT 1.4



SECTION 12 - TRAINING

12.1 Introduction

The Company will equip and train a Spill Response Team to respond to spills as set out in the **PLAN**.

12.2 Responsibility Of The Safety/Training Manager

Training is the responsibility of the Safety/Training Manager. The requirements for training and a training record are shown in **Table 12.1**.

The Safety/Training Manager will identify a suitable person on each shift that will be the designated Spill Response Co-ordinator and will identify two further persons on each shift that together will constitute the three-man Spill Response Team for the shift. Members of a team will specialise in certain areas such as mine rescue, first aid, fire fighting, spill containment and spill clean-up.

Environmental sensitivity training will be done on an after-hour basis in the form of lectures and slide-shows by knowledgeable speakers invited for the purpose.

Refer also to sub-section **11.3 In-house Report And Follow-up**.

SECTION 13 - PLAN MAINTENANCE AND DISTRIBUTION**13.1 Plan Maintenance**

It is the responsibility of the Safety/Training Manager to review the **SPILL CONTINGENCY PLAN** every three months and to revise the **PLAN** as required. These revisions will include recommendations made as the result of a spill as per sub-sections **1.6 Independent Audit & 11.3 In-house Report And Follow-up.**

13.2 Distribution Of The Plan

It is the responsibility of the Safety/Training Manager to ensure that a distribution list is maintained and that revisions are incorporated in all copies of the **PLAN**. The distribution list is shown in **Table 13.1.**

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EXHIBIT 1.4

APPENDIX 1

CONTAINMENT AND CLEAN-UP

1.1 General

A number of Spill Response Plans are described below.

Time is of the essence in spill containment as it is important to limit the spread of the spill and thus the impact on the environment. The containment techniques used will depend upon the particular circumstances of the spill and a number of techniques may be required for a single spill.

Planning for the cleanup of a spill can be done with attention to detail and this will include damage assessment, selection of techniques and cost effectiveness. The lead agency will monitor this activity to ensure that the public interest is properly protected, see **APPENDIX 2 - LETTER OF UNDERSTANDING**. The lead agency may also have to approve specific clean-up techniques such as in-situ burning or chemical dispersion.

Air and water temperatures can affect the behaviour of oil or fuel and the nature of the containment and clean-up techniques used. Temperature affects viscosity and evaporation rate and can directly affect the performance of clean-up personnel and equipment.

The various containment and clean-up techniques will be reviewed in detail as part of the spill response training as per **SECTION 12-TRAINING**.

1.2 Good Housekeeping

Minor spills of fuel, oil, reagents, ammonium nitrate prill and other material that occur will be cleaned up on an ongoing basis as part of day-to-day housekeeping.

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EXHIBIT 1.4

1.3 Fuel And Oil Spill

- a. Eliminate sources of ignition.
- b. Minimize the quantity of fuel or oil spilled. Close valves and plug leaks if possible.
- c. Do not let the spilled fuel or oil enter a body of water or a watercourse.
- d. Contain the spilled fuel or oil in a natural basin or a sump constructed from available materials such as soil or snow. Use equipment to construct a containment or construct the containment by hand.

Recover spilled fuel or oil if possible with a pump.

Use soil, snow, organic matter such as moss or commercial absorbents to absorb remaining fuel or oil. Snow is a very effective absorbent for fuels or oils during the winter months. Do not use sawdust as an absorbent when dealing with highly combustible fuels.

Absorbent materials are available in a number of forms, viz:

- i. Squares and strips;
- ii. Rolls and sweeps;
- iii. Absorbent booms and pillows;
- iv. Loose material.

Specific procedures for the use of each absorbent are shown in **Table A 1.1**.

- e. Contain spilled fuel or oil that has reached a body of water or a watercourse by booming if possible. A guide to booming techniques that may be suitable for particular water bodies is shown in **Figure A 1.1**. Oil and fuel containment techniques for rivers, streams and lakes are illustrated in **Figures A 1.2, A 1.3 and A 1.4** respectively.

River currents often exceed 1 knot (0.50 m/s) which is the velocity above which boom failure usually occurs. Containment booming is relatively ineffective in streams where currents exceed this velocity; diversion booming can however be used.

Absorbent booms are used mainly on quiet waters with minor fuel or oil contamination. Permeable barriers made of wire mesh screen with absorbents held in place by the wire mesh as shown in **Figure A 1.5** may be suitable. Alternatively, single-sided barriers with the absorbent material placed on the upstream side and held in place by the current, may be used.

- f. Fuel or oil will not seep into layers of permafrost or into frozen surfaces during the winter months. The organic mat overlying permafrost has a high insulation value. Be careful to minimize the disturbance during any clean-up operation.

g. Fuel or oil spilled on ice will seep into cracks and be absorbed by the porous surface of the ice. Pools of fuel or oil on ice can be readily recovered. Fuel or oil absorbed in the ice surface can be recovered as the ice melts.

h. The clean-up techniques used will depend largely upon the particular circumstances of the spill and detail will be provided as various spill scenarios are developed. Used absorbents and contaminated material will be removed from the site of the spill and transported to an approved location. Alternatively, burning the residues on site may be the most practical method of disposal.

Both the cleanup of the spill and disposal of contaminated material must be done in consultation with the designated lead agency.

Note that the evaporation and biodegradation of residual fuel or oil are directly related to temperature. The temperatures at certain times of the year will determine the persistence and therefore the need for clean-up of residual fuel or oil.

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1.4 Propane Spill

a. Assess the risk of fire:

- i. If there is no fire or no risk of fire, proceed with containment.
- ii. If there is a fire, evacuate to a safe area upwind of the fire. Fire fighting procedures are described in the MSDS.

b. Eliminate all sources of ignition.

c. Stop a leak if possible. Wear self-contained breathing apparatus when working in an area filled with vapors. If the leak cannot be stopped, permit the gas to vent to the atmosphere. Vapors may flow on surface for considerable distances and may accumulate in low spots and may reach a source of ignition and flash back.

THE VAPOR-AIR MIXTURE PRESENTS A SERIOUS EXPLOSION HAZARD

d. Avoid contact with liquid propane.

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1.5 Ammonium Nitrate Prill Spill

Ammonium nitrate prill is not toxic under normal working conditions.

IF AMMONIUM NITRATE PRILL HAS BEEN CONTAMINATED WITH DIESEL FUEL IN A SPILL, TREAT AS A CLASS 1.5 EXPLOSIVE

- a. Assess the risk of fire:
 - i. If there is no fire, proceed with containment and clean-up.
 - ii. If there is a fire, refer to the fire fighting procedures in the MSDS.
- b. Contain the spill. Dike to prevent dispersion of the prill by rain if necessary.
- c. Small volumes of prill not contaminated with diesel fuel, will be cleaned up by hand using rakes and shovels.
- d. Larger volumes of prill not contaminated with diesel fuel can be cleaned up with mechanical equipment such as a backhoe and truck.
- e. Clean prill will be taken to the mine and will be used in normal blasting operations.
- f. Prill contaminated with organic material, soil or snow will be returned to the supplier for disposal in an approved manner.

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1.6 Explosives Spill

The XL/BXL Transportation Emergency Response Plan is registered with CANUTEC - Plan ERP 02-0081. A copy of the plan has been attached to this PLAN.

ALWAYS BE AWARE OF THE RISK OF FIRE IN ANY INCIDENT INVOLVING EXPLOSIVE PRODUCTS - BE PREPARED TO FIGHT A FIRE

Explosive products may detonate as a result of impact, friction or static or stray electrical charges. Fire is considered the major threat in an explosives spill.

a. Assess the risk of fire:

- i. If fire threatens the explosives, evacuate to a distance of approximately 1,600 m from the spill.
- ii. If a small fire is detected that does not threaten the explosives, attempt to extinguish the fire using any available means, e.g. fire extinguishers, water, sand or snow.
- iii. Remove all possible sources of ignition.

b. Always secure the area surrounding an explosives spill with reflectors or flashers and barricades

b. The clean-up must be done by or under the direct supervision of the explosives' supplier.

NEVER LEAVE A LOAD OF EXPLOSIVES UNATTENDED

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EXHIBIT 1.4

1.7 Copper Concentrate Spill

On Land:

- a. Contain the spill. Dike to prevent dispersion by rain if necessary.
- b. Load concentrate into a truck using a loader or backhoe or by hand if the quantities are small. Do a final cleanup by hand.
- c. Copper concentrate from a spill can be returned to the mine for re-milling.

In Water:

- a. Contain the spread of concentrate by damming or by diverting flow of water if possible.
- b. Use an excavator to remove concentrate and contaminated sediments from the body of water if necessary.

Always consult with a person from the lead agency before doing any work in or before fording a body of water. See **APPENDIX 2 - LETTER OF UNDERSTANDING.**

- c. Contaminated soils can be disposed of in a landfill after consultation with an official from the lead agency assigned to the spill, see **APPENDIX 2 - LETTER OF UNDERSTANDING.**

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EXHIBIT 1.4

SPILL CONTINGENCY PLAN

Table A 1.1
Sorbent Materials Application Techniques

Form of Sorbent	Description of Technique
1. Squares and Strips (Pads)	<ul style="list-style-type: none"> ● Placed in confined areas to pick up small quantities of oil; they should be left for a period of time for greater effectiveness.
2. Rolls	<ul style="list-style-type: none"> ● Used in the same manner as squares and strips but usually more convenient since they can be torn or cut off at the optimum length. ● Very effective in protecting walkways, boat decks, working areas, previously uncontaminated or cleaned areas; can be used to cover areas used as temporary storage sites for oily materials. ● Disposal is facilitated by rolling up sorbent and placing in suitable container.
3. Booms	<ul style="list-style-type: none"> ● Can serve a dual function by absorbing oil and acting as a boom but is only effective in very quiet waters. ● The tightly compacted sorbent material encased in mesh restricts oil penetration thus requiring the boom to be rotated and moved around in the oil to work efficiently. It is usually better to drive the oil into the boom. ● Can be used effectively to protect sheltered areas against oil contamination. Also can be deployed behind skimmers to pick up excess or missed oil. ● Disposal is accomplished by folding, rolling, and/or stuffing the boom into plastic or burlap bags for removal.
4. Loose Materials	<p>Loose sorbent materials are not recommended for use in oil spills on water for the following reasons:</p> <ul style="list-style-type: none"> ● Without efficient means of recovering loose sorbent materials, tidal action, wind, and currents will disperse oil-soaked sorbents over a large area, thus complicating the cleanup effort.

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EXHIBIT 1.4

Table A 1.1
Continued
Sorbent Materials Application Techniques

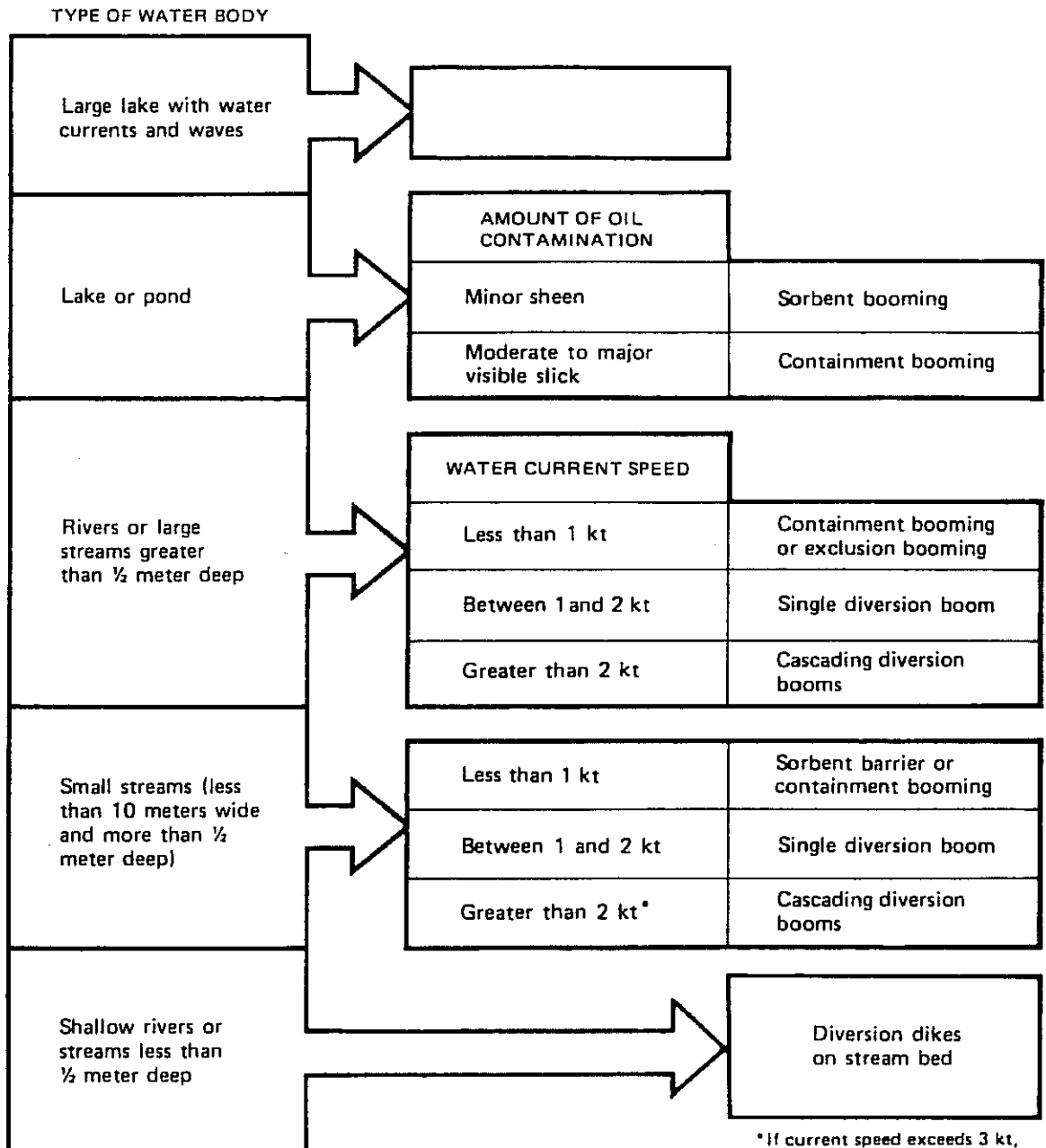
Form of Sorbent	Description of Technique
	<ul style="list-style-type: none">● Large-scale recovery of loose sorbents such as straw, polyurethane foam, and peat moss is not considered practical in open water, and at the present time no effective equipment is available for this purpose.● Loose sorbent materials tend to clog vacuum equipment when they are used for oil pickup. <p>Loose sorbent materials may have limited applicability in the cleanup of oil from land areas where pools of oil have formed in depressions.</p>

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EXHIBIT 1.4

SPILL CONTINGENCY PLAN

Figure A 1.1

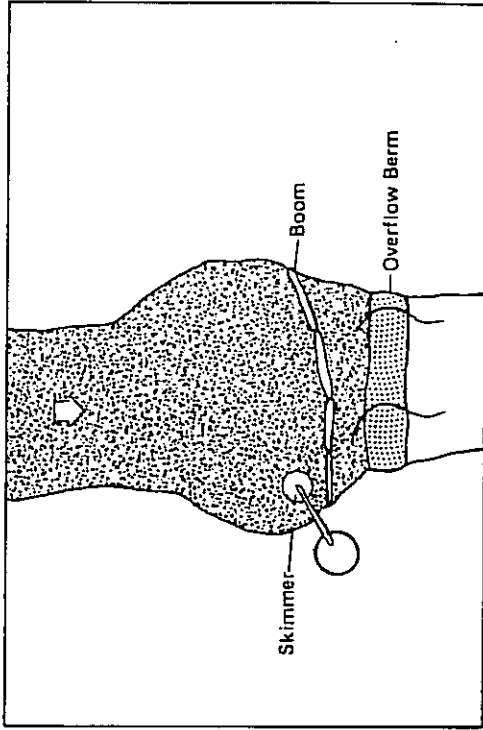
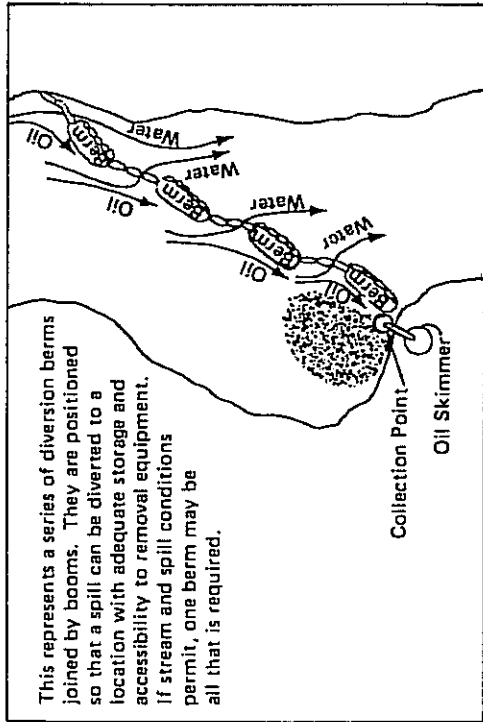
Booming Techniques



* If current speed exceeds 3 kt, booming should be attempted at an alternate location where currents are slower.

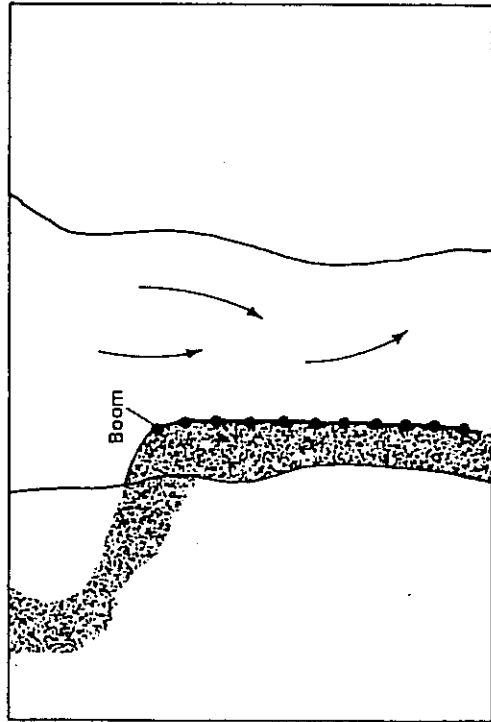
SPILL CONTINGENCY PLAN

Figure A 1.2

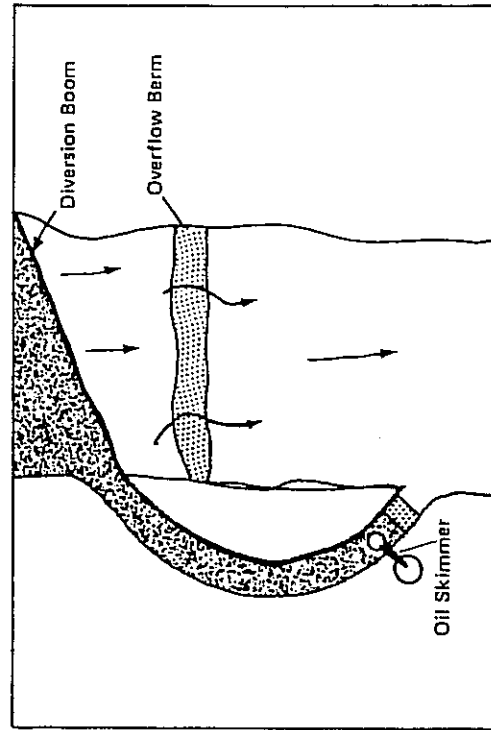


A. Diversion berms and booms

B. Overflow berm and boom



C. Booming parallel to shoreline

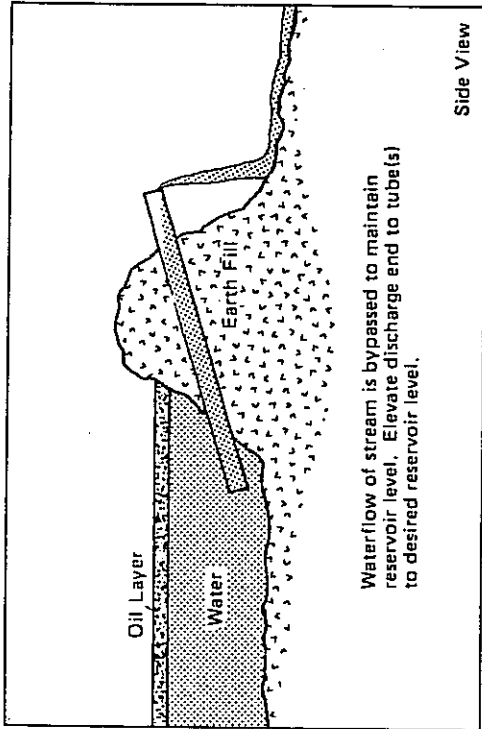


D. Diversion boom/side channel containment

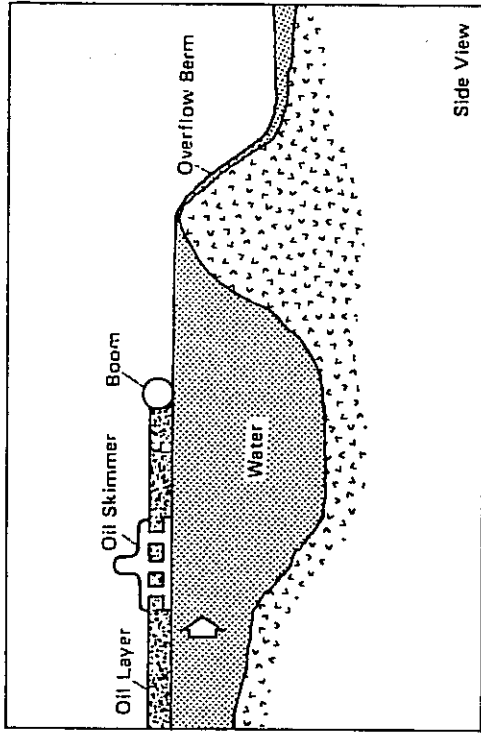
Oil containment on rivers.

SPILL CONTINGENCY PLAN

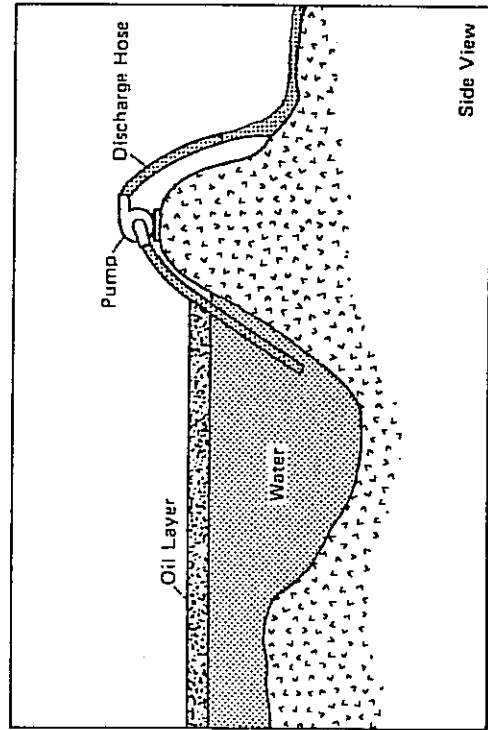
Figure A 1.3



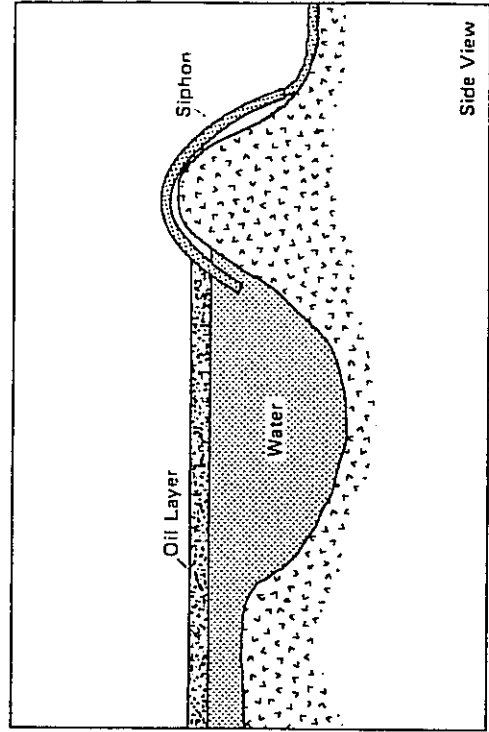
A. Underflow dam



B. Overflow berm



C. Overflow dam with pump

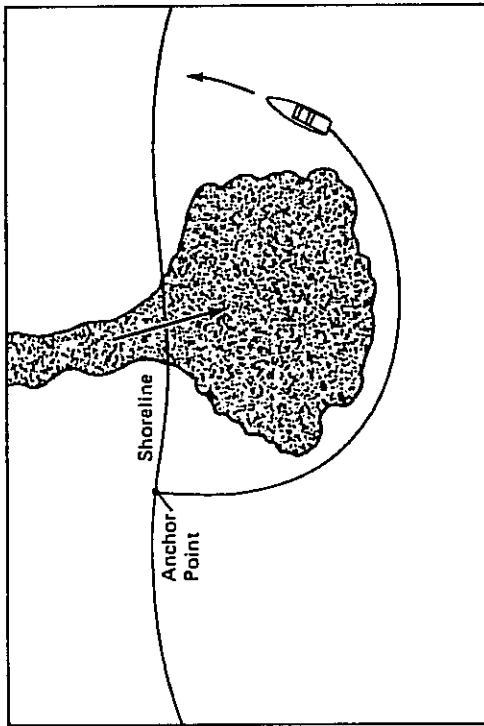


D. Overflow dam with siphon

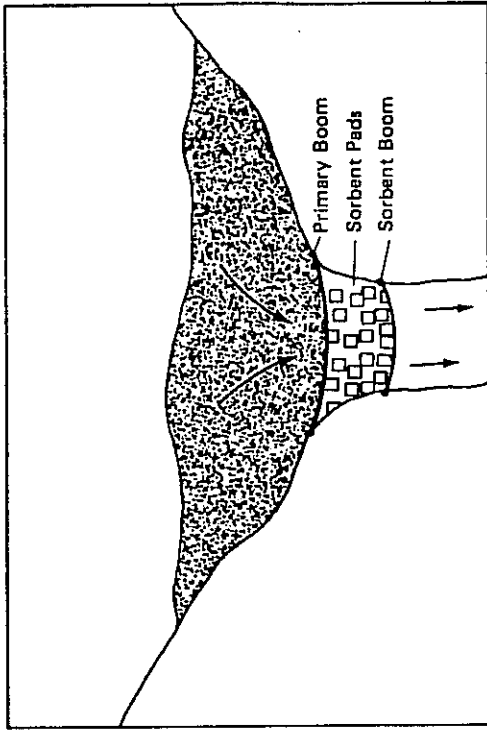
Oil containment on streams.

SPILL CONTINGENCY PLAN

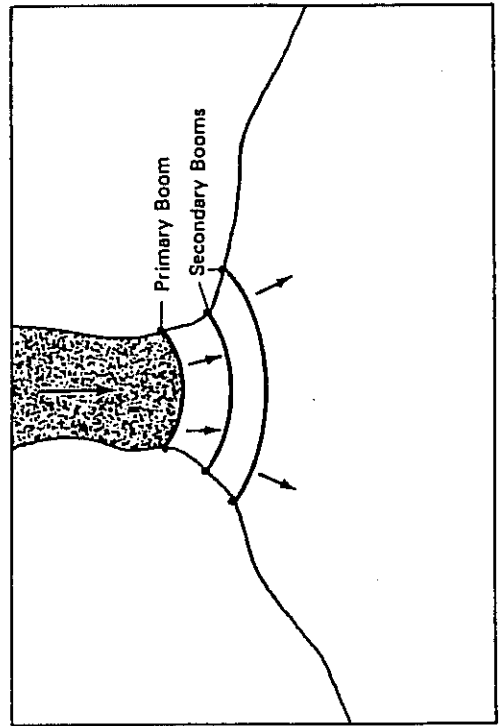
Figure A 1.4



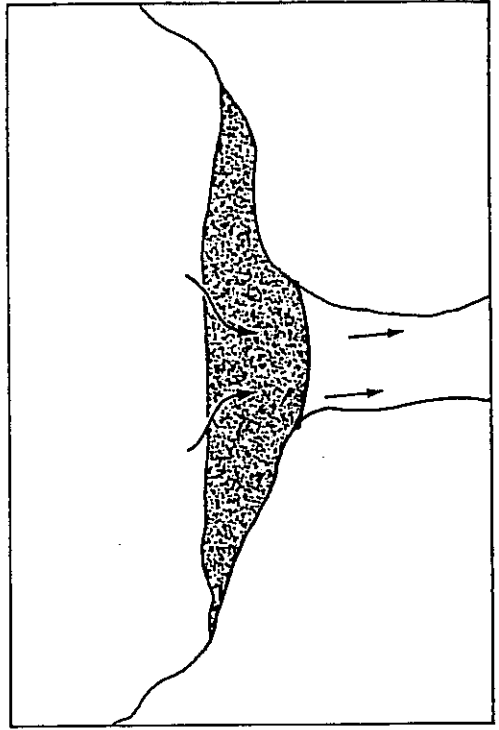
A. Containment booming at source



B. Containment/sorbent booming at lake outlet



C. Containment booming at lake inlet



D. Containment booming at lake outlet

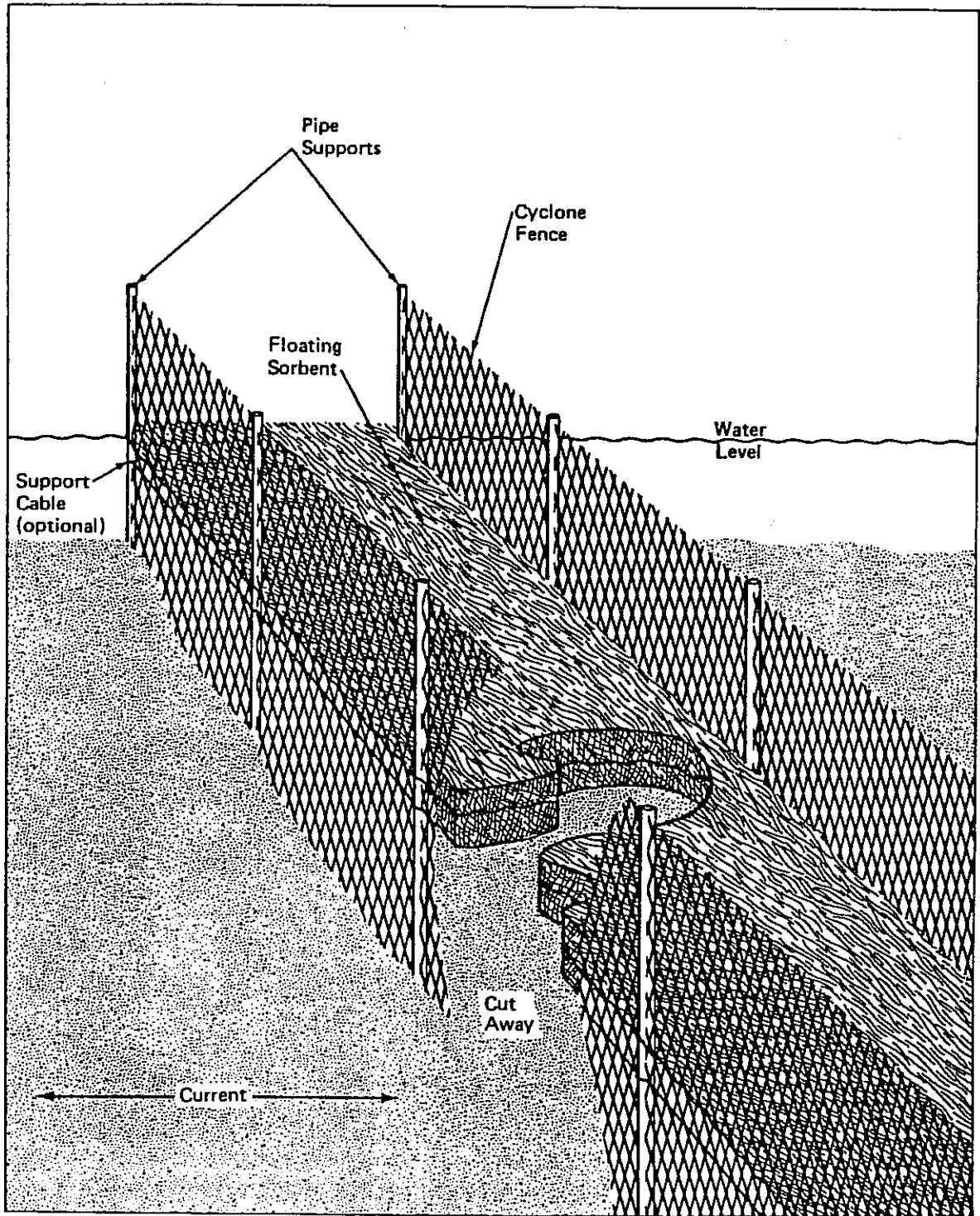
QZ96-006
EXHIBIT 1.4

Oil containment on lakes.

SPILL CONTINGENCY PLAN

Figure A 1.5

Typical Permeable Barrier



Typical permeable barrier.

QZ96-006
EXHIBIT 1.4

APPENDIX 2**LETTER OF UNDERSTANDING****CONCERNING GOVERNMENT RESPONSE TO SPILLS IN THE YUKON****BETWEEN**

Director of Renewable Resources
Northern Affairs Program
Department of Indian Affairs and Northern Development
Government of Canada

AND

Manager, Yukon Division, Environmental Protection
Environment Canada
Government of Canada

AND

Area Supervisor
Department of Fisheries and Oceans
Government of Canada

AND

Fire Marshal
Department of Community and Transportation Services
Government of Yukon

AND

Manager, Transport Services
Department of Community and Transportation Services
Government of Yukon

AND

Director, Environmental Protection
Renewable Resources
Government of Yukon

AND

Chief Administrative Officer
City of Whitehorse

AGREE as follows:

QZ96-006

EXHIBIT 1.4

- 1 -

REPORTING

- A. A single point of contact (667-7244) to notify government agencies of spills in the Yukon will be operated and maintained by Environment Canada, Environmental Protection, on a 24-hour basis.
- B. When a spill is reported, the officer on duty shall request the specific information required by government to evaluate the spill and shall record this information on a spill and dangerous goods incident report form.
- C. The 24-hour spill reporting number (667-7244) will be listed, where appropriate, on all new licences, authorizations and permits issued by the parties to this agreement to promote reporting all discharges, emissions and escapes of substances posing a danger to life, health, property and the environment.

ALERTING

- D. Upon receipt of a spill report the officer on duty shall notify by the quickest means possible the government agency responsible for leading the investigation and provide particulars of the spill. Allocation of the responsibility for spill response will be based on statutory responsibilities and interdepartmental agreements as listed in Table 1.
- E. Each government agency shall designate a staff member and alternate(s) as spill response representatives to receive the reports of spills. Environment Canada, Environmental Protection, will maintain a listing of these names, position titles and contact numbers for use in alerting government agencies.
- F. All other government agencies with a need to know will also be informed about the report through Environmental Protection, and shall be advised which agency has been designated the lead. Criteria for alerting government agencies party to this agreement will be identified by the agencies and provided to Environment Canada, Environmental Protection, to facilitate rapid dissemination of spill reports.

Note: YTG Transport Services criteria, for example, indicates notification to them in the event of a transportation dangerous occurrence.

QZ96-006

EXHIBIT 1.4

-2-

- G. Situation report updates and final reports from the lead agency will also be provided to those agencies with a need to know, as per the criteria referred to above.

RESPONSIBILITIES OF THE LEAD AGENCY

- H. The lead agency will be responsible for initial investigation and management of the spill; consulting with other government agencies; undertaking to collect evidence to support legal action if necessary and ensuring that suitable containment and clean-up measures have been taken.
- I. Co-ordinate communication between government agencies and the party responsible for the spill.
- Note: This effectively provides a "one window" approach in dealing with the operator responsible.
- J. Act as the point of contact for media or other inquiries from the public.
- K. Provide situation update reports to the 24-hour Spill Report Line for circulation to other government agencies as a means of keeping others apprised of developments. In the case of a major spill, a series of regularly updated reports shall be prepared and sent to the Spill Report Line. A final report shall be submitted to the Spill Report Line upon completion of each incident.
- L. Request any necessary assistance and advice from other government agencies in the form of expertise, manpower and other support.

GENERAL

- M. Government agencies party to this agreement shall make support available to the lead agency to facilitate government's response to spills, enhance co-operation and ensure effective use of existing government resources.

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EXHIBIT 1.4

-3-

Note: This would allow for inter-agency loan of expertise - for example, persons trained in procedures for taking legal samples.

- N.** This agreement cannot prejudice any legal mandate and responsibility of any agency party to this agreement.
- O.** Inspections involving more than one government agency may take place for preliminary or initial investigations provided the lead agency co-ordinates the involvement and remains the prime point of contact between government and the operator responsible for the spill. This may be particularly desirable in the event of an incident where there is a choice of legislative mandates under which to proceed.

Note: This is a mechanism for two agencies with overlapping legislative mandates to participate together and share the efforts of joint inspections or investigations.

- P.** If prosecution is contemplated and there is a choice of legislation to proceed under, the agencies with the legislative mandates may, by joint consultation, decide the preferred legislative action.

Note: This allows for co-ordination in the event of litigation.

- Q.** Environment Canada, Environmental Protection, agrees to maintain a file to retain all reports and other documentation circulated during the investigation of each spill in order to provide a data base of information.
- R.** The signatories to this Letter of Understanding recognize that this agreement is intended to include Yukon First Nation Governments at their request.
- S.** This agreement may be amended at any time by written agreement of the parties.

QZ96-006
EXHIBIT 1.4

-4-

AS WITNESS the hands of the parties hereto:

Bruce ChambersDate: 1 February 1995.Bruce Chambers
Director, Renewable Resources
Northern Affairs ProgramGeorge MacKenzie-GrieveDate: 95/02/01George MacKenzie-Grieve, Manager
Environmental Protection
Environment CanadaBurt HuntDate: 1 Feb 95.Burt Hunt
Area Manager
Dept. of Fisheries & OceansJack HolesworthDate: Jan 31, 1995Jack Holesworth
Fire Marshall
Community & Transportation ServicesLynn AlcockDate: Jan 31, 1995Lynn Alcock
Manager, Transport Services Branch
Community & Transportation ServicesJoe BallantyneDate: Jan 31, 1995Joe Ballantyne
Director, Environmental Protection & Assessment
Renewable ResourcesBryce WattDate: January 31/95Bryce Watt
Chief Administrative Officer
City of WhitehorseQZ96-006
EXHIBIT 1.4

January ,1995

Table 1**LEAD AGENCY DESIGNATION FOR SPILL RESPONSE**

<u>TYPE OF SPILL</u>	<u>LEAD AGENCY</u>
1. Spills from an operation licensed to use water under the <i>Yukon Waters Act</i>	DIAND - Water Resources
2. All spills on operation areas under Land Use Permits as per <i>Territorial Lands Act</i>	DIAND - Land Use
3. Spills from bulk fuel storage facilities and service stations	YTG Public Safety Branch
4. Spills on Commissioner's land (highways)	YTG Transport Services
5. Spills involving road shipments of hazardous wastes	Environmental Protection Canada
6. Spills from federal facilities	Environmental Protection
7. Spills on unregulated federal lands	Environmental Protection
8. Spills into water from operations not subject to a licence or permit:	
- oil and chemicals (S.36[3] <i>Fisheries Act</i>)	Environmental Protection
- Habitat destruction, including suspended solids (S.35[] <i>Fisheries Act</i>)	Fisheries & Oceans
9. Spills of substances under <i>Yukon Environment Act</i>	YTG Renewable Resources
10. Spills within City of Whitehorse	City of Whitehorse Fire Dept.
11. Spills within other organized communities	To be shared among the above parties as per their legislative mandates

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EXHIBIT 1.4

April 1995

Table 2

GOVERNMENT SPILL RESPONSE REPRESENTATIVE

<u>AGENCY</u>	<u>REPRESENTATIVE</u>	<u>CONTACT #</u>
ENVIRONMENTAL PROTECTION	24 hour phone <i>Action Answering 633-7200</i> Mobile	Fax 667-7962 667-7244 <i>Pager 634</i> 1-667-1407
	George Balmer	W: 667-3406 H: 667-6563
	Alternates:	
	Steve Arrell	W: 667-3470 H: 633-3301
	George MacKenzie-Grieve	W: 667-3401 H: 668-5214
CITY OF WHITEHORSE	Fire Department Brian Monaghan	Fax 668-8389 668-8699
DIAND WATER RESOURCES	Tony Polycyk	Fax 667-3195 W: 667-3227 H: 668-4983 Mobile 2M 8455
Alternates:	Kevin Rumsey	W: 667-3132 H: 633-4843
	Mark Zrum	Fax 668-7756 W: 667-3173 H: 668-3993
	Kevin Ristau	W: 667-3236 H: 633-3546

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EXHIBIT 1.4

Table 2 (continued)**FISHERIES & OCEANS
(DFO)**Siegi Kriegl
(North Yukon)
YL2-5996Fax 668-6829
W: 668-7548
H: 667-4815
Dawson 993-5474Neil Robinson
North Slope)W: 979-3473
H: 979-4217
Fax 979-4330**Alternates:**

Al von Finster

W: 668-4611
H: 667-4317

Burt Hunt

W: 667-2235
H: 667-4935**YTG ENVIRONMENTAL PROTECTION**

Fax 667-4727

Bryan Levia

W: 667-3436
H: 633-5507

Dan Lindsey

W: 667-8936
H: 633-5545

Bengt Pettersson

W: 667-5610
H: 668-3720**YTG PUBLIC SAFETY BRANCH**

Fax 667-7209

Jack Holesworth

W: 667-5217
H: 633-3161

Alternate: Folkie Johnson

W: 667-5230
H: 633-2488**YTG HIGHWAYS & TRANSPORTATION**

Fax 668-7864

Bob Thompson
Pager 185W: 667-3032
H: 633-2188

Fred Jennex

W: 667-5313
H: 668-2945QZ96-006
EXHIBIT 1.4

APPENDIX 3**EMERGENCY MEASURES ORGANIZATION**

The Yukon has an Emergency Measures Organization (EMO) which is based in Whitehorse.

Yukon Community and Transportation Services
Emergency Measures Organization
P.O. Box 2703, Whitehorse, Yukon Y1A 2C6
Phone: (403) 667-5220 (24 hours)
Fax: (403) 667-4566

The EMO has a Civil Emergency Planning Officer and A Guide To Initial Emergency Response Roles was issued dated November 10, 1995.

The Yukon has been divided into Preparedness Areas and these follow the RCMP detachment boundaries. Lead agencies have been designated for various types of emergencies, consisting both of local agencies and other agencies of the territorial and federal governments. The local lead agency, supported by the local EMO, will provide an initial response. Where conditions are overwhelming, the local EMO will be supported by the Yukon EMO and additional resources will be mobilized as required.

Emergency Resource Locations and available supplies are shown in **Figure A 3.1**.

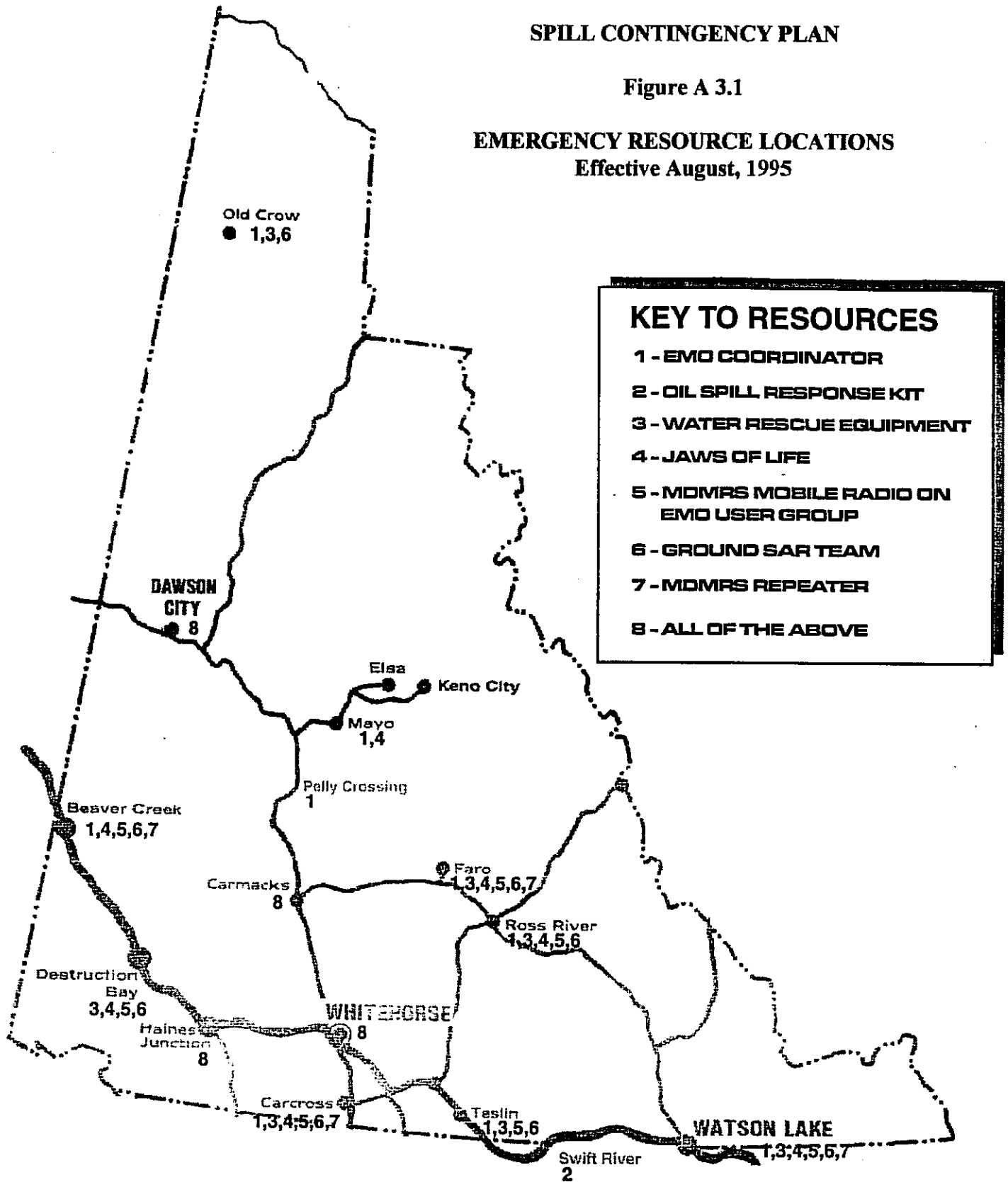
The Carmacks EMO is well-equipped and can provide valuable support in an emergency. Carmacks is seeking approval for a full-time fire chief and emergency co-ordinator.

QZ96-006
EXHIBIT 1.4

SPILL CONTINGENCY PLAN

Figure A 3.1

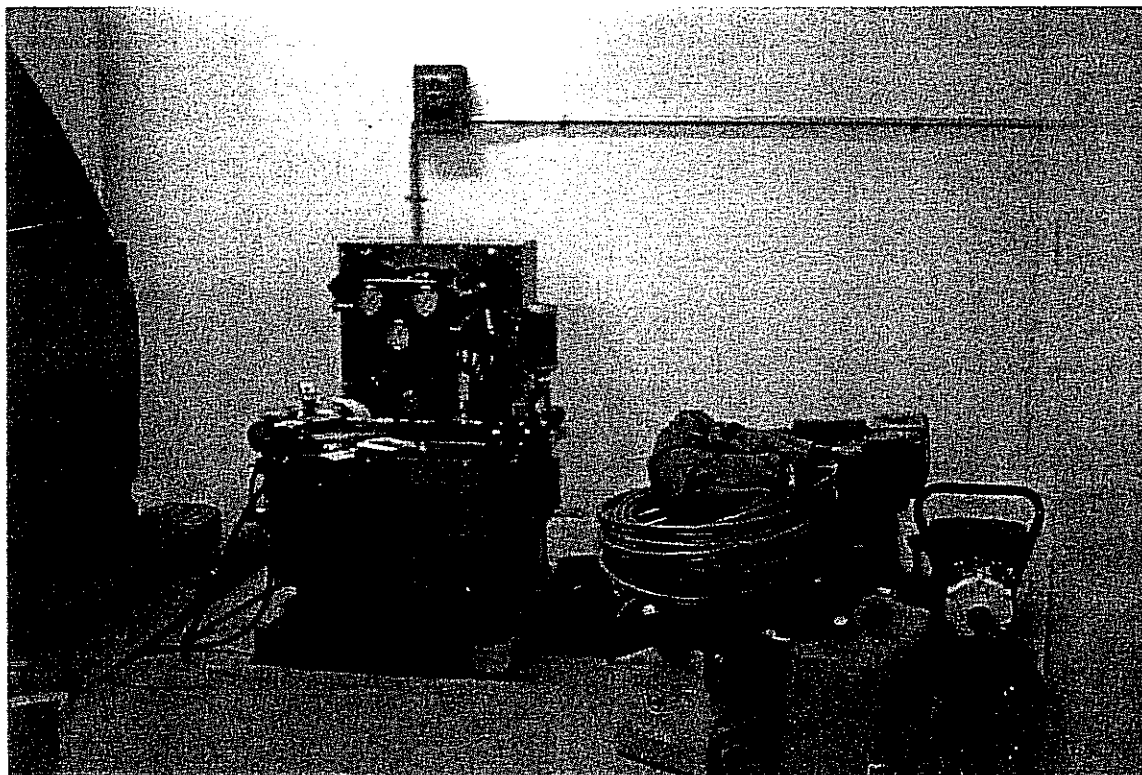
EMERGENCY RESOURCE LOCATIONS Effective August, 1995



SEARCH AND RESCUE STATION - CARMACKS YUKON



Rescue vehicle.



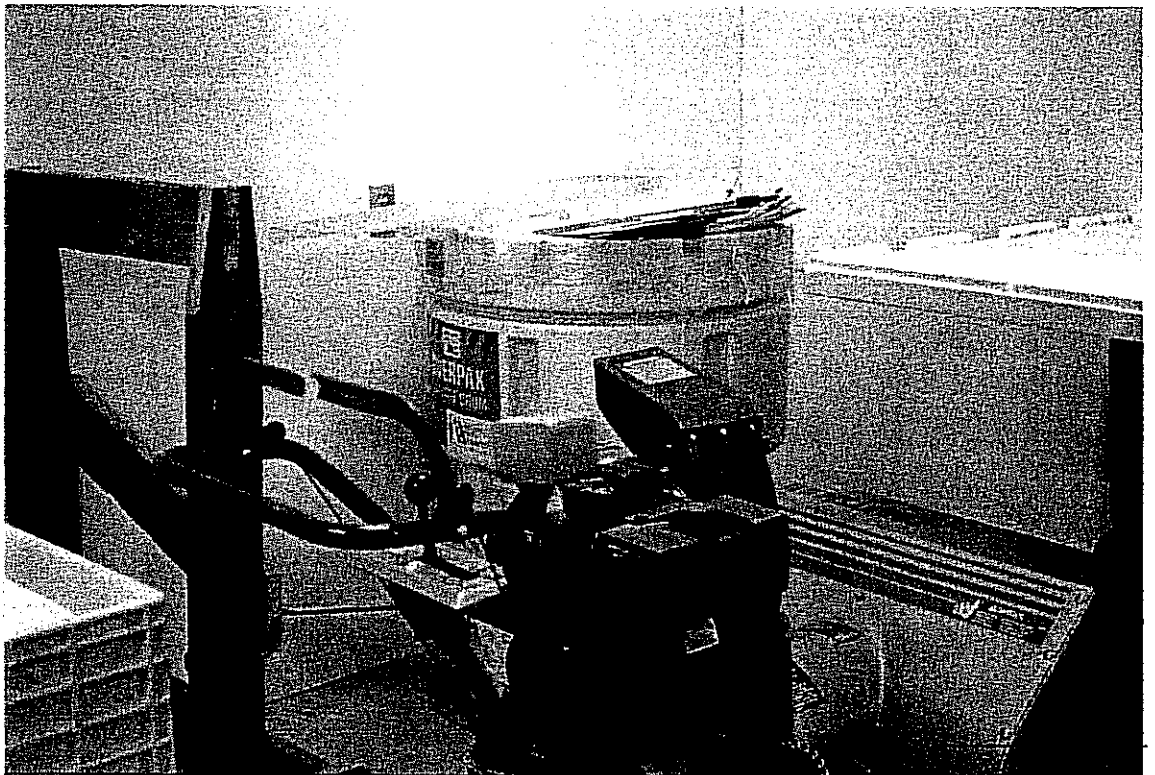
Part of the rescue equipment available in Carmacks; breathing air compressor, auger and hydraulic power pack. QZ96-006

EXHIBIT 1.4

OIL SPILL RESPONSE KIT - CARMACKS YUKON

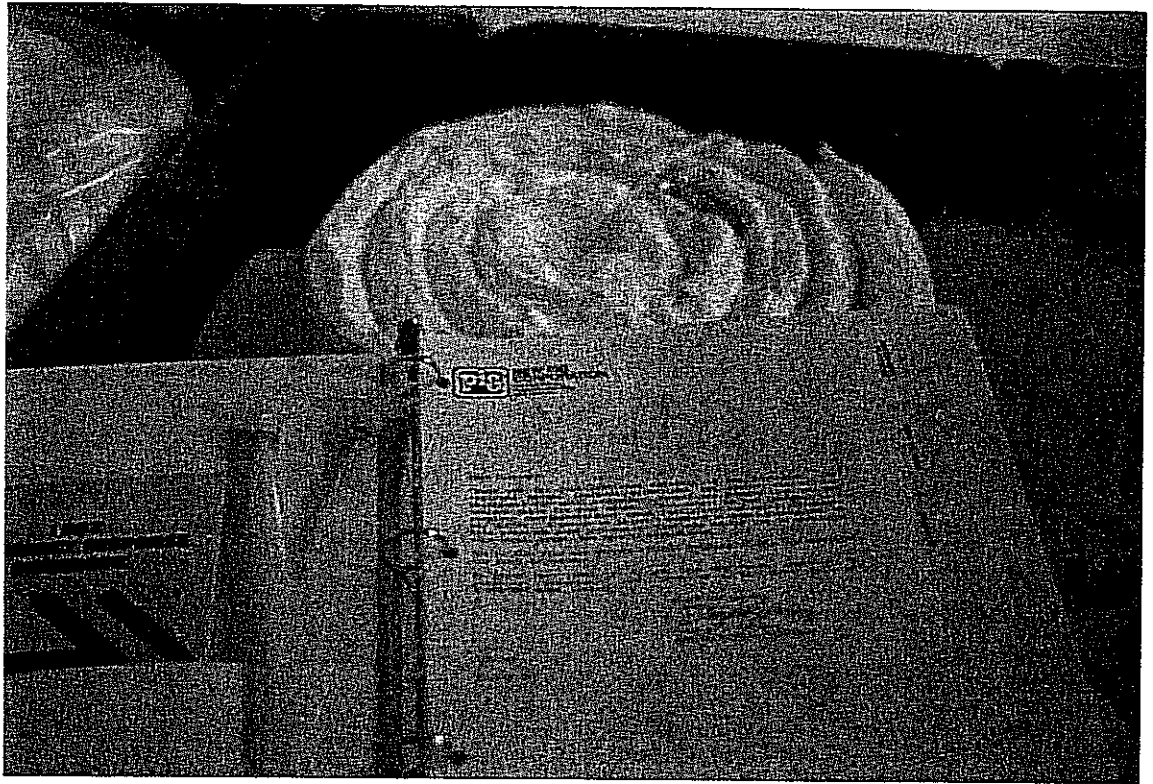


Spill response palletized container filled with adsorbant mats and containment booms. Spare material in adjacent boxes.



Storage and shipping drum for oil soaked mats and booms.

0790-006
EXHIBIT 1.4



Response kit instruction manual.

QZ96-006
EXHIBIT 1.4

APPENDIX 4

ACTS AND REGULATIONS

The jurisdiction with respect to spills that have an impact on the environment, is shared between the Yukon and federal governments. The applicable acts and regulations are described in sub-section 2.2, Chapter 12 - Yukon of the following reference and listed below (Refer also to **APPENDIX 2 - LETTER OF UNDERSTANDING**):

"Environmental Spills - Emergency Reporting, Clean-up and Liability", Moira L. McConnell, B.A., LL.B, Ph.D. and Erika C. Gerlock, B.Sc., LL.B., Carswell - Thomson Professional Publishing, 1993.

The section on the Yukon was written by Bruce L. Willis, Q.C., Preston, Willis, Leitch & Lackowicz, Barristers & Solicitors, 2093 Second Ave., Whitehorse, Yukon Y1A 1B5. Mr. Willis is the Chair of the Environmental Law Section of the Canadian Bar Association.

2.2 Territorial and Federal Legislation Relevant to Environmental Spills

(i) Territorial

1. *Dangerous Goods Transportation Act*, R.S.Y. 1986, c. 39
Regulations: OIC 1988/85 as am. OIC 1989/45
2. *Gasoline Handling Act*, R.S.Y. 1986, c. 79
Regulations: OIC 1972/137 as am. 1975/300
3. *Environment Act*, S.Y. 1991, c. 5 (Not all Parts are proclaimed)
Regulations: Recycling Fund, OIC 1992/135
Beverage Container, OIC 1992/136
4. *Occupational Health and Safety Act*, R.S.Y. 1986, c. 123
Regulations: General, OIC 1986/164
Laboratories, OIC 1987/138
Workplace Hazardous Materials, OIC 1988/107, as am. OIC 1988/193

(ii) Federal

5. ~~*Northern Inland Waters Act*, R.S.C. 1985, c. N-25, as am. 1990, c. 8, s. 58; 1991, c. 50; 1993, c. 40
Regulations: ~~Northern Inland Waters Regulations, SOR/82-767, as am. SOR-84-157. SOR/93-303~~~~
6. *Yukon Waters Act*, S.C. 1992, c. 40
Regulations: Yukon Waters Regulations, SOR/93-303
7. *Territorial Lands Act*, R.S.C. 1985, c. T-7, as am. 1985, c. 7 (3rd Supp.); 1991, cc. 24, s. 51 (to come into force), 50, s. 45; 1993, cc. 28, s. 78 (to come into force), 41, ss. 13, 14
Regulations: NOTE - numerous regulations not mentioned, but among the relevant regulations are:
Territorial Land Use Regulations, SOR/82-217, as am. SOR/88-169;
SOR/93-303
Yukon Timber Regulations, SOR/79-50, as am. SOR/87-191, SOR/92-592

0296-006

EXHIBIT 1.4

APPENDIX 5**MSDS**

The following MSDS have been included in this appendix:

Mill Reagents:

Aerophine 3418A

Aero 5100

Aerofroth S-7304

Superfloc 1202

Aeropromoter S-6493

Sodium Sulphide - Na₂S

Fuel:

Diesel fuel

Gasoline

Propane

Other:

Ammonium nitrate - used as a blasting agent when mixed with diesel fuel (AN/FO)

Motor Oil

Copper Concentrate

A Health And Safety Data Sheet for Copper Concentrate is shown in **Section 10 - MSDS, Figure 10.1.**

QZ96-006
EXHIBIT 1.4

PRODUCT NAME : AEROPHINE 3418A

EMERGENCY CONTACT: 1-800 424-9300

HAZARD CLASS : HEALTH 2; FIRE 1; REACTIVITY 0;

VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B.C. V6X 1W6

SALES ORDER:

VAN WATERS & ROGERS PRODUCT: 01316

MSDS NUMBER: L0013 VERSION: 3

DATE PRINTED: 05/01/95

Not a controlled product under the WHMIS regulations.

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC
(800) 424-9300.

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION-----

PRODUCT NAME: AEROPHINE 3418A CAS NO.: UNASSIGNED
COMMON NAMES/SYNONYMS: SODIUM DIISOBUTYL- VW&R CODE: L0013
DITHIOPHOSPHINATE, 50% AQUEOUS SOLUTION

MOLECULAR WEIGHT: N/D

FORMULA: MIXTURE
HAZARD RATING (MANUFACTURER)
HEALTH: 2
FIRE: 1
REACTIVITY: 0
SPECIAL: NONE

DATE ISSUED: 04/94
SUPERCEDES: 07/91
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

-----HAZARDOUS INGREDIENTS-----

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, PPM			HAZARD
			OSHA PEL	ACGIH TLV	OTHER LIMIT	
SODIUM DIISOBUTYLDITHIO- PHOSPHINATE (13360-78-6)		50	NONE	NONE	NONE	IRRITANT
WATER (7732-18-5)		50	NONE	NONE	NONE	NONE

* TRADE MARK OF AMERICAN CYANAMID COMPANY

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: 223 VAPOR PRESSURE, MM HG/20 DEG C: 17.5
(VALUE OF WATER)
MELTING POINT, DEG F: NOT APPLICABLE VAPOR DENSITY (AIR=1): N/D
SPECIFIC GRAVITY (WATER=1): 1.1 WATER SOLUBILITY, %: 100
APPEARANCE AND ODOR: EVAPORATION RATE (BUTYL ACETATE=1): N/D
COLORLESS TO LIGHT YELLOW OR GREEN LIQUID
WITH HYDROGEN SULFIDE-LIKE ODOR
% VOLATILE (BY WEIGHT): APPROX. 50 (WATER) PH: 8.5-10.0

-----FIRST AID MEASURES-----

IF INHALED: UNLIKELY TO BE NECESSARY.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING
WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY.
GET IMMEDIATE MEDICAL ATTENTION.

0796-006

EXHIBIT 1.4

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: UNLIKELY TO BE NECESSARY.

-----HEALTH HAZARD INFORMATION-----

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT.

SIGNS AND SYMPTOMS OF EXPOSURE
INHALATION: NONE CURRENTLY KNOWN.

EYE CONTACT: LIQUID AND MIST MAY IRRITATE THE EYES.

SKIN CONTACT: MILD SKIN IRRITANT.

SWALLOWED: NONE CURRENTLY KNOWN.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

ORAL: RAT LD50 = 3.35 G/KG

DERMAL: NO DATA FOUND

INHALATION: RABBIT LD50 = >5 G/KG

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NONE

-----PERSONAL PROTECTION-----

VENTILATION: WHERE THIS MATERIAL IS NOT USED IN A CLOSED SYSTEM, GOOD ENCLOSURE AND LOCAL EXHAUST VENTILATION SHOULD BE PROVIDED TO CONTROL EXPOSURE.

RESPIRATORY PROTECTION: A RESPIRATOR IS NORMALLY NOT REQUIRED IF THIS PRODUCT IS USED WITH ADEQUATE VENTILATION.

EYE PROTECTION: CHEMICAL GOGGLES. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, IMPERVIOUS BOOTS, IMPERVIOUS GLOVES, AND IMPERVIOUS APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: NOT APPLICABLE

FLAMMABLE LIMITS IN AIR, %

METHOD USED: NOT APPLICABLE

LOWER: N/D, UPPER: N/D

EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL FOAM.

AUTOIGNITION TEMPERATURE, DEG F: NOT APPLICABLE

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

-----HAZARDOUS REACTIVITY-----

0296-006
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STABILITY: STABLE
CONDITIONS TO AVOID: NONE.

POLYMERIZATION: WILL NOT OCCUR

MATERIALS TO AVOID: STRONG OXIDIZERS, STRONG MINERAL ACIDS.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF PHOSPHORUS, HYDROGEN SULFIDE, AND OXIDES OF SULFUR.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL, AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOILS. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE. STORE AWAY FROM ALL OTHER CHEMICALS AND POTENTIAL SOURCES OF CONTAMINATION. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----PREPARATION INFORMATION-----

CONTACT MSDS CO-ORDINATOR, VAN WATERS & ROGERS LTD.
DURING BUSINESS HOURS, PACIFIC TIME (604)-273-1441.

-----NOTICE-----

VAN WATERS & ROGERS LTD. EXPRESSLY DISCLAIMS ALL EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCT PROVIDED.

-----REVISION-----

04/94: WHMIS 3 YEAR REVISION

===== END OF MSDS =====

QZ96-006
EXHIBIT 1.4

PRODUCT NAME : AERO 5100 PROMOTER

EMERGENCY CONTACT: (905) 356-8310

HAZARD CLASS : HEALTH 1; FIRE 2; REACTIVITY 0; HAZARD CLASS 3.3, FLAMMABLE

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CYTEC

MATERIAL SAFETY DATA

MSDS No: 2591
Date: 12/17/93
Supersedes: 07/04/92

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **AERO⁺ 5100 Promoter**

SYNONYMS: Dialkyl Thionocarbamate

CHEMICAL FAMILY: Dialkyl Thionocarbamate

MOLECULAR FORMULA: Mixture

MOLECULAR WGT: Mixture

USE: Mining Chemicals

MANUFACTURED BY: CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA,
WEST PATERSON, NEW JERSEY 07424, USA - 201/357-3100

SUPPLIED BY: CYTEC CANADA INC., 88 MCNABB STREET, MARKHAM, ONTARIO L3R 6E6 905/470-3800
EMERGENCY PHONE: In CANADA: 905/356-8310 In USA: 1-800/424-9300 or 202/483-7816.

+Trademark or registered Trademark

2. COMPOSITION/INFORMATION ON INGREDIENTS

WHMIS REGULATED COMPONENTS

COMPONENT	CAS. NO.	%	TWA/CEILING	REFERENCE
Isobutanol	000078-83-1	7.5	50 ppm	OSHA/ACGIH

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Straw yellow to brown clear liquid with some garlic odor.

STATEMENTS OF HAZARD:

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION
COMBUSTIBLE LIQUID AND VAPOR

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE:

The acute oral (rat) and dermal (rabbit) LD50 values for this material are 773 mg/kg and greater than 2000 mg/kg, respectively.

Direct contact with this material may cause eye and skin irritation.

Refer to Section 11 for toxicology information on the WHMIS regulated components of this product.

4. FIRST AID MEASURES

In case of skin contact, wash affected areas of skin with soap and water.

In case of eye contact, immediately irrigate with plenty of water for 15 minutes.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: 116 F; 47 C

METHOD: Tag Closed Cup

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EXHIBIT 1.4

FLAMMABLE LIMITS

(% BY VOL): Not available

AUTOIGNITION TEMP: Not available

DECOMPOSITION TEMP: Not available

MECHANICAL/STATIC SENSITIVITY: Areas containing this material should have fire-safe practices and electrical equipment in accordance with Electrical and Fire Protection Codes (NFPA-30) governing Class III A Combustible Liquids.

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Use water spray, alcohol foam, carbon dioxide or dry chemical to extinguish fires. Water stream may be ineffective. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Remove sources of ignition.

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls Personal Protection), wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

7. HANDLING AND STORAGE

Keep away from heat and flame. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Areas containing this material should have fire-safe practices and electrical equipment in accordance with Electrical and Fire Protection Codes (NFPA-30) governing Class III A Combustible Liquids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Engineering controls are not usually necessary if good hygiene practices are followed. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Avoid unnecessary skin contact. Impervious gloves and apron are recommended to prevent skin contact. For operations where eye or face contact can occur, wear eye protection such as chemical splash-proof goggles or face shield. Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION" (NIOSH).

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Straw yellow to brown clear liquid with some garlic odor.

BOILING POINT: Not available

MELTING POINT: Not available

VAPOR PRESSURE: Not available

SPECIFIC GRAVITY: 0.99 @ 25 C

VAPOR DENSITY: Not available

% VOLATILE (BY WT): 100

pH: Not applicable

SATURATION IN AIR (% BY VOL): Not available

EVAPORATION RATE: Not available

QZ96-006

EXHIBIT 1.4

SOLUBILITY IN WATER: Negligible

ODOR THRESHOLD: See section 2 for permissible exposure limits.

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: None known

POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None known

INCOMPATIBLE MATERIALS: Strong acid or base and also oxidizing agents.

HAZARDOUS DECOMPOSITION/ COMBUSTION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, and oxides of sulfur and nitrogen.

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the WHMIS regulated components of this product is as follows: Isobutanol has acute oral (rat) and dermal (rabbit) LD50 values of 2.46 g/kg and 3.4 g/kg, respectively. The LC50 (rat) following a 4-hour inhalation exposure is >6000 ppm. Acute overexposure to isobutanol vapor can cause irritation to the eyes (severe), skin (moderate), and mucous membranes, as well as, central nervous system depression. Direct contact with isobutanol will cause severe eye and moderate skin irritation.

12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.

OCTANOL/H₂O PARTITION COEF.: Not available

13. DISPOSAL CONSIDERATIONS

Disposal must be made in accordance with applicable governmental regulations.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

	TRANSPORT CANADA FLAMMABLE LIQUID, N.O.S.	ICAO/IATA FLAMMABLE LIQUID, N.O.S.
SHIPPING NAME:		
HAZARD CLASS:	3.3	3
SUBSIDIARY CLASS:	—	—
UN / ID NUMBER:	1993	1993
PACKING GROUP:	III	III
TRANSPORT LABEL REQUIRED:	Flammable Liquid	Flammable Liquid
PACKING INSTR:	Not Applicable	

PASSENGER 309
CARGO 310

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EXHIBIT 1.4

MAX NET QTY:	Not Applicable	PASSENGER 80L CARGO 220L
SHIPPING NAME:	D.O.T. SHIPPING INFORMATION FLAMMABLE LIQUID, N.O.S.	IMO SHIPPING INFORMATION FLAMMABLE LIQUID, N.O.S.
HAZARD CLASS/ PACKING GROUP:	3 III	3.3 III
UN NUMBER:	UN1993	1993
IMDG PAGE:	Not Applicable	3345
D.O.T. HAZARDOUS SUBSTANCES:	(PRODUCT REPORTABLE QUANTITY) Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED:	Flammable Liquid	Flammable Liquid.

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.): (Contains isobutanol)

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and this Material Safety Data Sheet contains all the information required by the Controlled Products Regulations.

WHMIS CLASSIFICATION: CLASS B DIVISION 3 COMBUSTIBLE LIQUID

INVENTORY INFORMATION

CANADA DSL: Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

US TSCA: This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C.
This product contains a chemical substance that is subject to export notification under Section 12 (b) of the Toxic Substances Control Act, 15 U. S. C.

EEC EINECS: Product is not included in the European Inventory of Existing Chemical Substances (EINECS). For research and analysis purposes the product can be supplied in quantities of less than 1000 kg/yr. according to Council Directive 67/548/EEC, amended 79/831/EEC.

16. OTHER INFORMATION**NFPA HAZARD RATING (National Fire Protection Association)**

Fire 2	FIRE: Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
Health 1 —	HEALTH: Materials which on exposure would cause irritation but only minor residual injury even if no treatment is given.
Special 0 Reactivity	REACTIVITY: Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.

0296-006

EXHIBIT 1 A

REASON FOR ISSUE:

Revised Regulated Information

QZ96-006

EXHIBIT 1.4

Prepared by: Marvin A. Friedman, Ph.D., Director of Toxicology and Product Stewardship
Cytec Industries Inc.: 201/357-3100

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PRODUCT NAME : S-7304 FROTHER

EMERGENCY CONTACT: (905) 356-8310

HAZARD CLASS : HEALTH 2; FIRE 1; REACTIVITY 0; HAZARD CLASS 8, CORROSIVE

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CYTEC

MATERIAL SAFETY DATA

MSDS No: 6650
Date: 12/17/93
Supersedes: 04/14/93

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **REAGENT S-7304 Frother**

SYNONYMS: None

CHEMICAL FAMILY: Mixed monohydroxy polyalkylated alcohol

MOLECULAR FORMULA: Mixture

MOLECULAR WGT: Mixture

USE: Mining

MANUFACTURED BY: CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA,
WEST PATERSON, NEW JERSEY 07424, USA - 201/357-3100

SUPPLIED BY: CYTEC CANADA INC., 88 MCNABB STREET, MARKHAM, ONTARIO L3R 6E8 905/470-3600
EMERGENCY PHONE: In CANADA: 905/356-8310 In USA: 1-800/424-9300 or 202/483-7616.

2. COMPOSITION/INFORMATION ON INGREDIENTS

WHMIS REGULATED COMPONENTS

COMPONENT	CAS. NO.	%	TWA/CEILING	REFERENCE
Potassium hydroxide	001310-58-3	1-8	2 mg/M3 (ceiling)	OSHA/ACGIH

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Light to dark brown liquid; odor typical of glycol ethers

STATEMENTS OF HAZARD:

DANGER! CAUSES BURNS OF EYES AND SKIN

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE:

Acute oral (rat) and dermal (rabbit) LD50 values are estimated to be greater than 4.0 g/kg and greater than 2.0 g/kg, respectively. The 4-hour LC50 (rat) value is estimated to be greater than 2500 ppm.

Direct contact with this material may cause severe eye and skin irritation.

Inhalation overexposure may cause irritation of the respiratory tract and eyes.

Refer to Section 11 for toxicology information on the WHMIS regulated components of this product.

4. FIRST AID MEASURES

In case of skin contact, remove contaminated clothing without delay. Wear impervious gloves. Cleanse skin thoroughly with soap and water. Do not omit cleaning hair or under fingernails if contaminated. Do not reuse clothing without laundering. Do not reuse contaminated leatherware.

In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention without delay.

If vapor or dust of this material is inhaled, remove from exposure. Administer oxygen if difficulty in breathing.

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5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: 386 F; 197 C
METHOD: Setflash Closed Cup

FLAMMABLE LIMITS
(% BY VOL): Not available

AUTOIGNITION TEMP: Not available

DECOMPOSITION TEMP: Not available

MECHANICAL/STATIC SENSITIVITY: None

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Use water spray, carbon dioxide or dry chemical to extinguish fires. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus and full fire-fighting protective clothing. See Section 8 (Exposure Controls/Personal Protection) for special protective clothing.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls Personal Protection), wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

7. HANDLING AND STORAGE

Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure. Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands with soap and water. Prevent eye and skin contact. Wear the special protective equipment specified below for operations where eye or skin contact can occur. Prevent contamination of skin or clothing when removing protective equipment. Provide eyewash fountain and safety shower in close proximity to points of potential exposure. Where exposures are below the PEL, no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH or full protective suit with air supply appropriate for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION"(NIOSH). Special protective equipment - To prevent skin contact wear skin protection, such as impervious gloves, apron, workpants, long sleeve workshirt, or disposable coveralls. To prevent eye contact wear eye protection such as chemical splash proof goggles or face shield.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Light to dark brown liquid; odor typical of glycol ethers

BOILING POINT: 541 F; 283 C

MELTING POINT: Not available

VAPOR PRESSURE: Not available

SPECIFIC GRAVITY: 0.961-0.969

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EXHIBIT 1.4

VAPOR DENSITY: Not available
 % VOLATILE (BY WT): Not available
 pH: 9.0-10.0
 SATURATION IN AIR (% BY VOL): Not applicable
 EVAPORATION RATE: Not available
 SOLUBILITY IN WATER: Complete
 ODOR THRESHOLD: See section 2 for permissible exposure limits.

10. STABILITY AND REACTIVITY

STABILITY: Stable
 CONDITIONS TO AVOID: None known
 POLYMERIZATION: Will Not Occur
 CONDITIONS TO AVOID: None known
 INCOMPATIBLE MATERIALS: Do not store in close proximity with strong oxidizing agents.
 HAZARDOUS DECOMPOSITION/ COMBUSTION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide and/or carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the WHMIS regulated components of this product is as follows:
 Potassium hydroxide has an acute oral (rat) LD50 value of 273 mg/kg. Acute overexposure to Potassium hydroxide or dusts causes severe respiratory irritation. Potassium hydroxide is severely irritating to the eyes and skin.

12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.
 OCTANOL/H₂O PARTITION COEF.: Not available

13. DISPOSAL CONSIDERATIONS

Disposal must be made in accordance with applicable governmental regulations.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

	TRANSPORT CANADA	ICAO/IATA
SHIPPING NAME:	CAUSTIC ALKALI LIQUID, N.O.S.	CAUSTIC ALKALI LIQUID, N.O.S.
HAZARD CLASS:	8	8
SUBSIDIARY CLASS:	9.2	—
UN / ID NUMBER:	1719	1719
PACKING GROUP:	III	III

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TRANSPORT LABEL REQUIRED:	Corrosive	Corrosive
PACKING INSTR:	Not Applicable	PASSENGER 810 CARGO 821
MAX NET QTY:	Not Applicable	PASSENGER 5L CARGO 60L
SHIPPING NAME:	D.O.T. SHIPPING INFORMATION CAUSTIC ALKALI LIQUID, N.O.S.	IMO SHIPPING INFORMATION CAUSTIC ALKALI LIQUID, N.O.S.
HAZARD CLASS/ PACKING GROUP:	8 III	8 III
UN NUMBER:	UN1719	1719
IMDG PAGE:	Not Applicable	8136
D.O.T. HAZARDOUS SUBSTANCES:	(PRODUCT REPORTABLE QUANTITY) POTASSIUM HYDROXIDE (12,500 lbs)	Not Applicable
TRANSPORT LABEL REQUIRED:	Corrosive	Corrosive

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.): (Contains potassium hydroxide)

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and this Material Safety Data Sheet contains all the information required by the Controlled Products Regulations.

WHMIS CLASSIFICATION: CLASS D DIVISION 2B TOXIC
CLASS E CORROSIVE

INVENTORY INFORMATION

- CANADA DSL:** Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.
- US TSCA:** This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C.
- EEC EINECS:** All components of this product are included on the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC, amended 79/831/EEC.

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EXHIBIT 1.4

16. OTHER INFORMATION

NFPA HAZARD RATING (National Fire Protection Association)

Fire	1	0	Reactivity	—
Health	3	0	Reactivity	—
Special				

FIRE: Materials that must be preheated before ignition can occur.
HEALTH: Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.
REACTIVITY: Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.

REASON FOR ISSUE:

New Format

QZ96-006
EXHIBIT 1.4

Prepared by: Marvin A. Friedman, Ph.D., Director of Toxicology and Product Stewardship
Cytec Industries Inc.: 201/357-3100

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PRODUCT NAME : SUPERFLOC 1202 FLOCCULANT

EMERGENCY CONTACT: 1-800 424-9300

HAZARD CLASS :

=====

VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B.C. V6X 1W5

SALES ORDER:

VAN WATERS & ROGERS PRODUCT: 72373

MSDS NUMBER: L1275 VERSION: 1

DATE PRINTED: 06/03/95

WHMIS CODES: D.2B

-----EMERGENCY ASSISTANCE-----

For Emergency Assistance Involving Chemicals
Call CHEMTREC (800) 424-9300

-----PRODUCT INFORMATION-----

Product Name: SUPERFLOC+ 1202 FLOCCULANT VW&R Code: L1275

Common Name/Synonym: Anionic polyacrylamide in water-in-oil emulsion

CAS Registry Number: Unassigned

Chemical Name: N/D

Chemical Family: Anionic polyacrylamide copolymer

Formula: Mixture

Molecular Weight: Mixture

Product Use: Mining chemicals.

+Trademark or registered trademark of American Cyanamid Company.

-----PREPARATION INFORMATION-----

Date Issued: 01/93

Supersedes: 11/90 (P1845001)

Prepared By: MSDS Coordinator. Contact during business hours,
Pacific Time (604)-273-1441.

-----HAZARDOUS INGREDIENTS-----

Component(s)/CAS No.	% wt.	Exposure Limits	
		OSHA PEL	ACGIH TLV
Petroleum distillate hydrotreated light (64742-47-8)	24.00	400 ppm	N/D

Local regulated limits may vary.

-----PHYSICAL PROPERTIES-----

Boiling Point: approx. 347 F; approx. 175 C (value for oil phase)

Freezing/Melting Point: 0 F (-18 C)

Specific Gravity (Water=1): 1.0

Vapour Pressure: Similar to water

Vapour Density: Similar to water

pH: N/D

Solubility in Water: Appreciable

% Volatile: approx. 70 (by weight)

Evaporation Rate (Butyl Acetate=1): < 1

Odour Threshold: See Hazardous Ingredients Section for permissible
exposure limits.

Coefficient of Water/Oil Distribution: N/D

Appearance and Odour: White, viscous, opaque liquid; slight hydrocarbon
odour.

QZ96-006

EXHIBIT 1.4

Physical State: Liquid.

-----FIRE AND EXPLOSION INFORMATION-----

Flash Point/Method: > 200 F () 93.3 C) Pensky-Martens Closed Cup
 Lower Flammable Limit: N/D
 Upper Flammable Limit: N/D
 Autoignition Temperature: N/D

Extinguishing Media: Use water spray, carbon dioxide or dry chemical to extinguish fires.

Special Fire Fighting Procedures: Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus and full fire-fighting protective clothing. See "Preventative Measures" for special protective clothing.

Unusual Fire and Explosion Hazards: N/D

Hazardous Combustion Products: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, ammonia and/or oxides of nitrogen

Explosion Data

Sensitivity to Mechanical Impact: None
 Sensitivity to Static Discharge: None

Conditions of Flammability: N/D

-----HAZARDOUS REACTIVITY-----

Stability: Stable.
 Hazardous Polymerization: Will not occur.
 Conditions to Avoid: None known.

Materials to Avoid: Strong oxidizing agents. This material reacts slowly with iron, copper and aluminum, resulting in corrosion and product degradation.

Hazardous Decomposition Products: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, ammonia and/or oxides of nitrogen.

Conditions of Reactivity: None known.

-----FIRST AID MEASURES-----

If Inhaled: N/D

In Case of Eye Contact: In case of eye contact, immediately irrigate with plenty of water for 15 minutes.

In Case of Skin Contact: In case of skin contact, remove contaminated clothing without delay. Flush skin thoroughly with water. Do not reuse clothing without laundering.

If Ingested: N/D

Notes to Physician: N/D

-----HEALTH HAZARD INFORMATION-----

Primary Routes of Exposure: Inhalation, skin and eye contact, ingestion.

Signs, Symptoms and Effects of Exposure:

Inhalation: Overexposure to vapour may cause dizziness, drowsiness, headache, and nausea. Acute overexposure to petroleum distillate vapours may cause throat irritation.
 Eye Contact: Acute overexposure to petroleum distillate vapours may cause eye irritation.
 Skin Contact: On direct skin contact, petroleum distillate may produce a severe skin irritation.
 Ingestion: Aspiration of petroleum distillate may cause chemical pneumonitis nausea.

Chronic Effects of Exposure: Prolonged repeated exposure to petroleum

0790006
 EXHIBIT 1.4

distillate vapour may cause central nervous system damage as well as heart and blood disorders.

Medical Conditions Aggravated by Exposure: N/D
Additional Information: N/D

-----TOXICITY DATA-----

LD50 Oral (rat): >10 ml/kg
LD50 Dermal (rabbit): >10 ml/kg
LC50 (rat): about 15000 ppm (for various distillates)

Carcinogenicity: N/D
Sensitization: N/D

Irritancy: Minimal eye irritation was produced in rabbit testing. When this product was tested in rabbits for skin irritation under occlusive conditions, as would be produced if the product was spilled into boots, irreversible skin damage was produced. When the product was tested under non-occlusive conditions with 24-hours of skin contact, as would occur when product, was spilled on clothing, some eschar formation was observed but the overall skin irritation score was lower (2.2 moderately irritating).

Reproductive Effects: N/D
Teratogenicity: N/D
Mutagenicity: N/D
Toxicologically Synergistic Products: N/D
Other Data: N/D
Environmental Effects: N/D

-----PREVENTATIVE MEASURES-----

Ventilation (Engineering Controls): Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

Personal Protective Equipment

Respiratory: Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION (NIOSH)".

Eye: For operations where eye or face contact, can occur, wear eye protection such as chemical splash proof goggles or face shield.

Clothing: Protective clothing such as impervious gloves, apron, workpants, long sleeve work shirt, or disposable coveralls are recommended to prevent skin contact.

Footwear: N/D

Other Protective Measures: Eyewash equipment and safety shower should be provided in areas of potential exposure.

Action to Take for Spills or Leaks: Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Exposure Control Methods, wear impervious boots. Spills of this product are very slippery. Spilled material should be absorbed onto an inert material and scooped up. The area should be thoroughly flushed with water and scrubbed to remove residue. If slipperiness remains apply more dry-sweeping compound.

Waste Disposal Method: Disposal must be made in accordance with applicable governmental regulations.

Storage and Handling Precautions and Equipment: To avoid product degradation and equipment corrosion, do not use iron, copper or aluminum containers or equipment. OSHA regulations (29 CFR 106.a.14), require that the flashpoint of materials of this type be determined by the Pensky-Martens Closed Tester method. The test for this product indicated it has a flashpoint greater than 200F (93.3C). Another method indicates a

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EXHIBIT 1

potential for flash at approximately 154F (67.8C); therefore, caution should be exercised in storage and handling.

Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands with soap and water. Avoid skin contact.

Special Shipping Information: N/D

Other Precautions: N/D

-----REGULATORY INFORMATION-----

TDG Classification

Shipping Name: Non-Regulated
UN: N/R
Class:
PKG:

WHMIS Classification: D.2B

Listed on the Domestic Substances List (DSL): Yes

-----FOR PRODUCT AND SALES INFORMATION-----

Contact Your Local Van Waters & Rogers Ltd. Branch Office.

-----NOTICE-----

VAN WATERS & ROGERS LTD. EXPRESSLY DISCLAIMS ALL EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCT PROVIDED.

-----REVISION INFORMATION-----

01/93: 3-year review. Reconstruction P1845001.

Legend: N/AP - Not Applicable. N/D - No Data Available:

===== END OF MSDS =====

PRODUCT NAME : S-6493 MINING REAGENT

EMERGENCY CONTACT: (905) 356-8310

HAZARD CLASS : HEALTH 3; FIRE 2; REACTIVITY 0; HAZARD CLASS 3, FLAMMABLE

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CYTEC

MATERIAL SAFETY DATA

MSDS No: 5824
Date: 02/15/94
Supersedes: 12/17/93

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **S-6493 Mining Reagent**

SYNONYMS: None

CHEMICAL FAMILY: Alkyl Hydroxamic Acids

MOLECULAR FORMULA: Mixture

MOLECULAR WGT: Mixture

USE: Specialty Polymers

MANUFACTURED BY: CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA,
WEST PATERSON, NEW JERSEY 07424, USA - 201/357-3100

SUPPLIED BY: CYTEC CANADA INC., 88 MCNABB STREET, MARKHAM, ONTARIO L3R 6E6 905/470-3600
EMERGENCY PHONE: In CANADA: 905/356-8310 In USA: 1-800/424-9300 or 202/483-7616.

2. COMPOSITION/INFORMATION ON INGREDIENTS

WHMIS REGULATED COMPONENTS

COMPONENT	CAS. NO.	%	TWA/CEILING	REFERENCE
Alkyl hydroxamic acids		~20	not established	

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Clear pale yellow liquid with pungent alcoholic odor.

STATEMENTS OF HAZARD:

DANGER! CAUSES EYE BURNS AND SKIN IRRITATION

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE:

The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and 4-hour inhalation LC50 (rat) values for this material are >5,000 mg/kg, >2,000 mg/kg and >2,500 ppm, respectively.

Direct contact with this material may cause severe eye and moderate skin irritation.

4. FIRST AID MEASURES

In case of skin contact, remove contaminated clothing without delay. Flush skin thoroughly with water. Do not reuse clothing without laundering.

In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention without delay.

If vapor or dust of this material is inhaled, remove from exposure. Administer oxygen if there is difficulty in breathing.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: 131 F; 55 C

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METHOD: Pensky-Martens Closed Cup

FLAMMABLE LIMITS

(% BY VOL): Not available

AUTOIGNITION TEMP: Not available**DECOMPOSITION TEMP:** Not available

MECHANICAL/STATIC SENSITIVITY: Areas containing this material should have fire-safe practices and electrical equipment in accordance with Electrical and Fire Protection Codes (NFPA-30) governing Class II Combustible Liquids.

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS:

Use water spray, alcohol foam, carbon dioxide or dry chemical to extinguish fires. Water stream may be ineffective. Use water to keep containers cool. Wear self-contained positive pressure breathing apparatus and full firefighting protective clothing. See Section 8 (Exposure Controls Personal Protection) for special protective clothing.

6. ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Remove sources of ignition.

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls Personal Protection), wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

7. HANDLING AND STORAGE

Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.

Areas containing this material should have fire-safe practices and electrical equipment in accordance with Electrical and Fire Protection Codes (NFPA-30) governing Class II Combustible Liquids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure. Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands with soap and water. Prevent eye and skin contact. For operations where eye or skin contact can occur wear the special protective equipment specified below. Prevent contamination of skin or clothing when removing protective equipment. Provide eyewash fountain and safety shower in close proximity to points of potential exposure. For operations where inhalation exposure can occur, a NIOSH approved respirator recommended by an industrial hygienist may be necessary. A full facepiece respirator also provides eye and face protection.

Special protective equipment - To prevent skin contact wear skin protection, such as impervious gloves, apron, workpants, long sleeve workshirt, or disposable coveralls. To prevent eye contact wear eye protection such as chemical splash proof goggles or face shield.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear pale yellow liquid with pungent alcoholic odor.

BOILING POINT: Not applicable

MELTING POINT: Not applicable

VAPOR PRESSURE: Not available

SPECIFIC GRAVITY: 0.89

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VAPOR DENSITY: 80; by weight
 % VOLATILE (BY WT): Not available
 pH: Not applicable
 SATURATION IN AIR (% BY VOL): Not available
 EVAPORATION RATE: Not available
 SOLUBILITY IN WATER: Negligible
 ODOR THRESHOLD: See section 2 for permissible exposure limits.

10. STABILITY AND REACTIVITY

STABILITY: Stable
 CONDITIONS TO AVOID: None known
 POLYMERIZATION: Will Not Occur
 CONDITIONS TO AVOID: None known
 INCOMPATIBLE MATERIALS: Avoid contact with strong oxidizing agents, acid or base.
 HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, and/or oxides of nitrogen.

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the WHMIS regulated components of this product is as follows:
 This product contains no WHMIS regulated (hazardous) components.

12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.
 OCTANOL/H₂O PARTITION COEF.: Not available

13. DISPOSAL CONSIDERATIONS

Disposal must be made in accordance with applicable governmental regulations.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

	TRANSPORT CANADA	ICAO/IATA
SHIPPING NAME:	FLAMMABLE LIQUID, N.O.S.	FLAMMABLE LIQUID, N.O.S.
HAZARD CLASS:	3	3
SUBSIDIARY CLASS:	—	—
UN / ID NUMBER:	1993	1993
PACKING GROUP:	III	III
TRANSPORT LABEL REQUIRED:	Flammable Liquid	Flammable Liquid

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PACKING INSTR: Not Applicable

PASSENGER 309
CARGO 310

MAX NET QTY: Not Applicable

PASSENGER 60L
CARGO 220L

D.O.T. SHIPPING INFORMATION
 SHIPPING NAME: FLAMMABLE LIQUID, N.O.S.

IMO SHIPPING INFORMATION
 FLAMMABLE LIQUID, N.O.S.

HAZARD CLASS/
PACKING GROUP: 3
III3.3
III

UN NUMBER: UN1993

1993

IMDG PAGE: Not Applicable

3345

D.O.T. HAZARDOUS SUBSTANCES: (PRODUCT REPORTABLE QUANTITY)
Not Applicable

Not Applicable

TRANSPORT LABEL REQUIRED: Flammable Liquid

Flammable Liquid

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.): (Contains dodecyl alcohol)

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and this Material Safety Data Sheet contains all the information required by the Controlled Products Regulations.

WHMIS CLASSIFICATION: CLASS B DIVISION 3 COMBUSTIBLE LIQUID
 CLASS D DIVISION 2B TOXIC

INVENTORY INFORMATION

CANADA DSL: The Canadian inventory information for this products MSDS has not been established yet.

US TSCA: The chemical, physical, and toxicological properties of this material have not been fully investigated. Its handling or use may be hazardous. Exercise Due Care. Since this material may contain chemicals not included in the Toxic Substances Control Act inventory, it must be used under the supervision of technically qualified individuals. Materials not included in the Toxic Substance Control Act inventory must not be used for commercial purposes.

EEC EINECS: Product is not included in the European inventory of Existing Chemical Substances (EINECS). For research and analysis purposes the product can be supplied in quantities of less than 1000 kg/yr. according to Council Directive 67/548/EEC, amended 79/831/EEC.

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16. OTHER INFORMATION**NFPA HAZARD RATING (National Fire Protection Association)**

Fire	2	FIRE: Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
Health	3	HEALTH: Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.
Reactivity	0	REACTIVITY: Materials which in themselves are normally stable, even under fire-exposure conditions, and which are not reactive with water.
Special	—	

REASON FOR ISSUE:

Revised Section 14

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EXHIBIT 1.4

Prepared by: Marvin A. Friedman, Ph.D., Director of Toxicology and Product Stewardship
Cytex Industries Inc.: 201/357-3100

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PRODUCT NAME : SODIUM SULPHIDE FLAKES

EMERGENCY CONTACT: 1-800 424-9300

HAZARD CLASS :

=====

VAN WATERS & ROGERS LTD. 9800 VAN HORNE WAY RICHMOND, B.C. V6X 1W5

SALES ORDER:

VAN WATERS & ROGERS PRODUCT:

MSDS NUMBER: LA1255 VERSION: 1

DATE PRINTED: 21/01/97

WHMIS CODES: D.1B E

-----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS
CALL CHEMTREC (800) 424-9300

SECTION I. PRODUCT INFORMATION

PRODUCT NAME: SODIUM SULPHIDE FLAKES VW&R CODE: LA1255

CHEMICAL FORMULA: Na₂S.
MOLECULAR WEIGHT: 132.
CHEMICAL FAMILY: INORGANIC.
MATERIAL USE: N.AV.

SECTION II. COMPOSITION/INFORMATION ON INGREDIENTS

%	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
SODIUM SULPHIDE			
60-62	1313-82-2	200 MG/KG (ORL-RAT)	N.AV.
		178 MG/KG (DRM-RBT)	

SECTION III. HAZARDS IDENTIFICATION

ROUTE OF ENTRY:

SKIN CONTACT: CORROSIVE. SHORT SINGLE EXPOSURE CAN CAUSE SEVERE BURNS.

SKIN ABSORPTION: CORROSIVE. HARMFUL IF ABSORBED THROUGH SKIN. CONTAINS MATERIALS THAT MAY BE HIGHLY TOXIC.

EYE CONTACT: CORROSIVE. CAN CAUSE CHEMICAL BURN; DAMAGE IRREVERSIBLE.

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MAY CAUSE SEVERE IRRITATION WITH CORNEAL INJURY AND RESULT IN PERMANENT IMPAIRMENT OF VISION, EVEN BLINDNESS.

INHALATION: FUMES IRRITATING TO THE EYES, NOSE, THROAT, AND LUNGS MAY BE PRODUCED.

INGESTION: MODERATELY TOXIC. SWALLOWING MAY BE FATAL. CORROSIVE. CAUSES SEVERE BURNS OF MOUTH, ESOPHAGUS AND STOMACH.

EFFECTS OF ACUTE EXPOSURE: REFER TO ROUTE OF ENTRY.
EFFECTS OF CHRONIC EXPOSURE: NO SPECIFIC DATA AVAILABLE.

SECTION IV. FIRST AID MEASURES

NOTES TO PHYSICIAN: TREATMENT IS SYMPTOMATIC AND SUPPORTIVE.

INSTRUCTIONS: FLUSH EYES WITH LARGE AMOUNTS OF RUNNING WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYE AND LIDS WITH WATER. GET IMMEDIATE MEDICAL ATTENTION.

REMOVE ANY CONTAMINATED CLOTHING AND WASH AFFECTED AREA WITH PLENTY OF SOAP AND WATER. GET MEDICAL ATTENTION WITHOUT DELAY. WASH CLOTHING AND DECONTAMINATE SHOES BEFORE REUSE.

IN CASE OF INHALATION, REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, ADMINISTER ARTIFICIAL RESPIRATION AND SEEK MEDICAL ATTENTION. OXYGEN MAY BE GIVEN BY QUALIFIED PERSONNEL IF BREATHING IS DIFFICULT.

IN CASE OF INGESTION: INDUCE VOMITING OF CONSCIOUS VICTIM IMMEDIATELY BY GIVING TWO GLASSES OF WATER AND PRESSING FINGER DOWN THROAT, WHILE KEEPING VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO LUNGS. CONTACT A PHYSICIAN IMMEDIATELY. DRINK PLENTY OF WATER. DO NOT GIVE ANYTHING BY MOUTH TO A CONVULSING OR UNCONSCIOUS PERSON.

SECTION V. FIRE FIGHTING MEASURES

T.D.G. FLAM. CLASS: NOT REGULATED.

FLAMMABILITY: NOT FLAMMABLE.

IF YES, UNDER WHICH CONDITIONS?

EXTINGUISHING MEDIA: N.AP. SUITABLE FOR SURROUNDING FIRE.

SPECIAL PROCEDURES: WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS.

FLASH POINT (C), METHOD: NON-FLAMMABLE.

AUTO IGNITION TEMPERATURE: N.AV.

UPPER FLAMMABLE LIMIT (% BY VOL): N.AV.

LOWER FLAMMABLE LIMIT (% BY VOL): N.AV.

EXPLOSION DATA:

EXPLOSIVE POWER: N.AV.

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RATE OF BURNING: N.AV.

SENSITIVITY TO STATIC DISCHARGE: N.AV.
SENSITIVITY TO IMPACT: N.AV.

UNUSUAL FIRE AND EXPLOSION HAZARDS: PRODUCTS OF COMBUSTION ARE TOXIC. CONTACT WITH ACIDS OR EXCESSIVE HEAT WILL LIBERATE POISONOUS, FLAMMABLE HYDROGEN SULFIDE GAS. HANDLE ACCORDING TO HAZARDS FOR HYDROGEN SULFIDE.

HAZARDOUS COMBUSTION PRODUCTS: SO₂. H₂S.

SECTION VI. ACCIDENTAL RELEASE MEASURES

LEAK/SPILL: EVACUATE AND LIMIT ACCESS TO AREA. VENTILATE. ELIMINATE ALL SOURCES OF IGNITION. ONLY TRAINED AND PROPERLY PROTECTED PERSONNEL SHOULD BE INVOLVED IN SPILL CLEANUP OPERATIONS. WEAR NIOSH/MSHA APPROVED RESPIRATOR (SELF-CONTAINED BREATHING APPARATUS PREFERRED) AND APPROPRIATE PROTECTIVE EQUIPMENT. SWEEP OR SHOVEL MATERIAL INTO WASTE CONTAINER. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS.

SECTION VII. HANDLING AND STORAGE

HANDLING PROCEDURES AND EQUIPMENT: AVOID CONTACT WITH EYES, SKIN, AND CLOTHING. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME. VENTILATE ADEQUATELY, OTHERWISE WEAR AN APPROPRIATE BREATHING APPARATUS. DO NOT SWALLOW. AVOID SMOKING, DRINKING OR EATING IN USE. KEEP CONTAINER CLOSED. MAINTAIN A GOOD PERSONAL HYGIENE.

STORAGE NEEDS: STORE AWAY FROM OXIDIZING MATERIALS AND ALL SOURCES OF IGNITION. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAMES. STORE AWAY FROM ACIDS. STORE IN A COOL AND WELL-VENTILATED AREA. KEEP CONTAINER CLOSED WHEN NOT IN USE. STORE AWAY FROM INCOMPATIBLE MATERIALS.

SECTION VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE: WEAR IMPERVIOUS GLOVES.

RESPIRATORY/TYPE: RESPIRATOR TYPE: ACID GAS. RESPIRATOR TYPE: DUST AND MIST. FOR EMERGENCY AND OTHER CONDITIONS WHERE THE EXPOSURE GUIDELINE MAY BE GREATLY EXCEEDED, USE AN APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS.

EYE/TYPE: CHEMICAL SAFETY GOGGLES. MONO GOGGLES.

FOOTWEAR/TYPE: BOOTS.

CLOTHING/TYPE: WEAR IMPERVIOUS PROTECTIVE CLOTHING. WEAR AN APRON AND/OR AN OVERALL.

OTHER/TYPE: N.AV.

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ENGINEERING CONTROLS: LOCAL EXHAUST AND GENERAL ROOM VENTILATION ARE REQUIRED TO MEET EXPOSURE STANDARDS.

PRECAUTIONARY MEASURES: SINCE A POTENTIALLY CRITICAL HAZARD IN WORKING WITH THIS PRODUCT MAY RESULT BECAUSE OF THE GENERATING OF HYDROGEN SULPHIDE GAS UNDER CERTAIN CONDITIONS, THE INSTALLATION OF A CONTINUOUS MONITORING HYDROGEN SULPHIDE GAS DETECTION AND ALARM SYSTEM IS RECOMMENDED.

SECTION IX. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: SOLID.
ODOUR: SLIGHT. SULPHUROUS ODOUR.
ODOUR THRESHOLD: N.AV.
VAPOUR PRESSURE (MMHG): N.AV.
VAPOUR DENSITY (AIR=1): N.AP.
EVAPORATION RATE: N.AP.
BOILING POINT: 174 C.
PH: ALKALINE.
SPECIFIC GRAVITY (WATER=1): 1.86.
SOLUBILITY IN WATER (% W/W): 15 (25(C)).
COEFFICIENT OF WATER/OIL DIST: N.AV.

SECTION X. STABILITY AND REACTIVITY

CHEMICAL STABILITY:

YES: YES.

NO, WHICH CONDITIONS?: AVOID CONCENTRATING SOLUTIONS - COULD CAUSE SPONTANEOUS IGNITION.

COMPATABILITY WITH OTHER SUBSTANCES:

YES:

NO, WHICH ONES?: STRONG OXIDIZING AGENTS. ACIDS. ZINC. COPPER, BRASS, ALUMINIUM. ALUMINUM AND ITS ALLOYS.

REACTIVITY CONDITIONS? CONTACT WITH INCOMPATIBLES.

HAZARDOUS PRODUCTS OF DECOMPOSITION: CONTACT WITH ACIDS WILL LIBERATE HYDROGEN SULFIDE GAS.

SECTION XI. TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL: NOT ESTABLISHED.

LD 50 OF MATERIAL, SPECIES & ROUTE: SEE SECTION II.

LC 50 OF MATERIAL, SPECIES & ROUTE: SEE SECTION II.

CARCINOGENICITY OF MATERIAL: NONE KNOWN.

REPRODUCTIVE EFFECTS: NONE KNOWN.

IRRITANCY OF MATERIAL: SEE SECTION III.

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SENSITIZING CAPABILITY OF MATERIAL: NONE KNOWN.
SYNERGISTIC MATERIALS: NONE KNOWN.

SECTION XII. ECOLOGICAL CONSIDERATIONS

ENVIRONMENTAL TOXICITY INFORMATION: MAY BE HARMFUL TO AQUATIC LIFE.
ACUTE AQUATIC EFFECTS DATA: . 48-HR LC50
(BLUEGILL SUNFISH) MG/L: . 61 PPM.

SECTION XIII. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: RECLAIM OR DISPOSE OF AT A LICENCED WASTE DISPOSAL
COMPANY. IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL
REGULATIONS.

SECTION XIV. TRANSPORT INFORMATION

UN NUMBER: 1849.
T.D.G. CLASSIFICATION: 8.
PACKING GROUP: II.
SPECIAL SHIPPING INSTRUCTIONS: N.AP.

SECTION XV. REGULATORY INFORMATION

WHMIS CLASSIFICATION: D.1B E

CPR COMPLIANCE: THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE
HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION
REQUIRED BY THE CPR.

-----MSDS INFORMATION-----

CONTACT MSDS CO-ORDINATOR, VAN WATERS & ROGERS LTD. DURING
BUSINESS HOURS, PACIFIC TIME (604) 273-1441.

DATE ISSUED: July 29, 1996
SUPERCEDES: New

-----NOTICE-----

**VAN WATERS & ROGERS LTD. EXPRESSLY DISCLAIMS ALL EXPRESSED OR IMPLIED
WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH
RESPECT TO THE PRODUCT PROVIDED.**

FOR UPDATED COPIES OF AN MSDS, PLEASE CONTACT YOUR LOCAL
VAN WATERS & ROGERS LTD. BRANCH.

-----REVISION INFORMATION-----

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07/96: This MSDS replaces L1402. New format; new series.

===== END OF MSDS =====

PRODUCT NAME : GASOLINE

EMERGENCY CONTACT: (519) 339-2145

HAZARD CLASS : FLAMMABLE LIQUID 3.1

Date Prepared: April 15, 1994
Supersedes: April 13, 1994
MSDS Number: 000108

Cette fiche signalétique est aussi disponible en français

1. PRODUCT INFORMATION

Product Identifier: UNLEADED GASOLINE

Application and Use:

Product Description:

A mixture of aliphatic and aromatic hydrocarbons and additives.

REGULATORY CLASSIFICATION

WHMIS:

Class D, Division 2, Subdivision A: Very Toxic Material.
Class B, Division 2: Flammable Liquids.

TRANSPORTATION OF DANGEROUS GOODS INFORMATION

Shipping Name: Gasoline
Class: Flammable Liquid 3.1
PIN Number: UN1203
Packing Group: II
Guide Number: 119

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 888-4111

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (j) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #	
Gasoline	> 99 v/v	8006-61-9	LD50 > 18ml/kg, ori, rat LD50 > 5ml/kg, skn, rbt
Methyl T-Butyl Ether	0-11 v/v	1634-04-4	LD50: 3.9g/kg, ing, rat LD50: > 10g/kg, skn, rbt LC50: 142Mg/L, inh, rat

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 0.80 cSt at 20 deg C
Vapour Density: 3.2
Boiling Point: 25 to 210 deg C
Evaporation rate: > 10 (1 = n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -60 deg C less than
Odour Threshold: not available
Vapour Pressure: 76 kPa to 103 kPa at 38 deg C
Density: 0.73 g/cc at 15 deg C
Appearance/odour: Naturally occurring water white or pale yellow; may be dyed a variety of colours for tax or other purposes; petroleum odour.

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects.
Avoid breathing vapours or mists.
Contains small amounts of methylcyclopentadienyl manganese tricarbonyl (MMT), benzene and n-hexane. MMT may cause nervous system, liver and kidney effects. Benzene may cause blood and/or the blood producing system disorder and/or damage; n-hexane may cause peripheral

(e.g. fingers, feet, arms etc.) nerve damage. In high concentrations gasoline components may cause central nervous system disorders.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

INGESTION:

Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:

The International Agency for Research on Cancer (IARC) has evaluated gasoline and found it to be a possible human carcinogen. Contains benzene. Human health studies (epidemiology) indicate that prolonged and/or repeated overexposures to benzene may cause damage to the blood producing system and serious blood disorders, including leukemia. Animal tests suggest that prolonged and/or repeated overexposures to benzene may damage the embryo/fetus. The relationship of these animal studies to humans has not been fully established. Contains n-hexane. Prolonged and/or repeated exposures may cause damage to the peripheral nervous system (e.g. fingers, feet, arms etc.).

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:
Oral : LD50 > 18 ml/kg (Rat)
Dermal : LD50 > 5 ml/kg (Rabbit)

OCCUPATIONAL EXPOSURE LIMIT:

Manufacturer recommends:

For Benzene (skin) 1) 5 ppm TWA for 8 hrs/day 2) 3 ppm TWA for 12 hrs/day 3) 250 ppm minutes for 5 to 30 minutes.
For Methyl-tert-butyl ether, a 15 minute short-term exposure limit (STEL) of 50 ppm.

ACGIH recommends:

For Gasoline, 300 ppm (900 mg/m3).
For n-Hexane, 50 ppm (180 mg/m3).
For Benzene, the ACGIH recommends a TLV of 10 ppm (30 mg/m3), and describes it as a substance of suspect carcinogenic potential in man.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.

Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
Where prolonged and/or repeated skin and eye contact is likely to occur,

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MATERIAL SAFETY DATA SHEET

wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear safety glasses with side shields.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces. Use explosion-proof ventilation equipment.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care. In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Store and load at normal (up to 38 deg C) temperature and at atmospheric pressure.
Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures.
For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Vapours or dust may be harmful or fatal. Warn occupants of downwind areas.

Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Eliminate all sources of ignition. Vapours or dust may be harmful or fatal. Warn occupants and shipping in downwind areas.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: -40 deg C COC D92 less than/moins de

Autoignition: NA Flammable Limits: LEL: 0.6% UEL: 8.0%

GENERAL HAZARDS:

Extremely flammable; material will readily ignite at normal temperatures.
Flammable Liquid; may release vapours that form flammable mixtures at or above the flash point.
Toxic gases will form upon combustion.
Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire if possible to do so without hazard. If a leak or spill has not ignited use water spray to disperse the vapours.
Either allow fire to burn out under controlled conditions or extinguish with foam or dry chemical. Try to cover liquid spills with foam.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

10. PREPARATION

Date Prepared : April 15, 1994
Prepared by: LUBRICANTS AND SPECIALTIES
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

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PRODUCT NAME : DIESEL FUEL (MIDDLE DISTILLATE)

EMERGENCY CONTACT: (519) 339-2145

HAZARD CLASS : FLAMMABLE LIQUID 3.3

Date Prepared: April 13, 1994
Supersedes: April 12, 1994
MSDS Number: 000116

Cette fiche signalétique est aussi disponible en français

1. PRODUCT INFORMATION

Product Identifier: MIDDLE DISTILLATE

Application and Use:

Product Description:

A complex mixture of aliphatic, olefinic, naphthenic and aromatic hydrocarbons.

REGULATORY CLASSIFICATION

WHMIS:

Class D, Division 2, Subdivision B: Toxic Material
Class B, Division 3: Combustible Liquids.

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT

All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TRANSPORTATION OF DANGEROUS GOODS INFORMATION

Shipping Name: Fuel oil
Class: Flammable liquid 3.3 Packing Group: III
PIN Number: UN1202 Guide Number: 123

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 968-4111

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Fuel Oil No.2	> 99.9 v/v	68476-30-2

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 1.30 cSt at 40 deg C
to 11.00 cSt at 40 deg C
Vapour Density: 4
Boiling Point: 150 to 370 deg C
Evaporation rate: < 1 (1 = n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: not available
Odour Threshold: not available
Vapour Pressure: 4 kPa at 38 deg C
Density: 0.85 g/cc at 15 deg C
Appearance/odour: White or pale yellow liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C). High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects. Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs. Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Irritating.
Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
Low toxicity.

INGESTION:

Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:

Lifetime skin painting tests indicate that materials of similar composition have produced skin cancer in experimental animals. The relationship of these results to humans has not been fully established.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral : LD50 > 5000 mg/kg (Rat)
Dermal : LD50 > 2000 mg/kg (Rabbit)
Inhalation : LC50 > 2500 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:

Manufacturer recommends:
100 ppm based on composition.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use. Where prolonged and/or repeated skin and eye contact is likely to occur, wear safety glasses with side shields, long sleeves, and chemical resistant gloves. Where skin and eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear long sleeves and safety glasses with side shields.

Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

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HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials. In keeping with good personal hygiene practices, wash hands thoroughly after handling the material. Do not handle or store near an open flame, sources of heat, or sources of ignition. Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures. Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust. Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: > 40 deg C PMCT D93

Autoignition: NA Flammable Limits: LEL: 0.7% UEL: 6.5%

GENERAL HAZARDS:

Combustible Liquid; may form combustible mixtures at or above the flash point. Toxic gases will form upon combustion. Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire. Use foam, dry chemical or water spray to extinguish fire. Respiratory and eye protection required for fire fighting personnel. Avoid spraying water directly into storage containers due to danger of boilover. A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

10. PREPARATION

Date Prepared : April 13, 1994
Prepared by: LUBRICANTS AND SPECIALTIES
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
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(800) 268-3183

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SECTION VI - TOXICOLOGICAL DATA (SYMPTOMS OF EXPOSURE)

INHALATION:

Propane may displace oxygen. Lack of oxygen may cause dizziness, headaches, stupor or unconsciousness.

The 8-hour TWA is 1,000 PPM.

ACUTE EXPOSURE:

EYES: As a gas, none. Liquid causes "cold" burns.

SKIN: Liquid causes, "cold burns" similar to frost bite.

RESPIRATORY SYSTEM: Little physiological effect at concentration below 10,000 PPM. Higher concentrations may cause dizziness and unconsciousness due to asphyxiation.

CHRONIC EXPOSURE: There are no reported effects of irritants, carcinogenicity, teratogenicity, mutagenicity, synergism or reproductive harm.

Name of toxicologically synergistic products not determined.

OTHER: Liquid can cause burns and frostbite if in direct contact with skin.

SENSITIZATION PROPERTIES: Skin - Unknown.

Respiratory - Unknown

MEDIAN LETHAL DOSE:

ORAL: Not applicable for gas.

DERMAL: Not applicable for gas.

IRRITATION INDEX:

SKIN: No appreciable effect (gas).

EYES: No appreciable effect (gas).

SECTION VII - OCCUPATIONAL CONTROL PROCEDURES

EYES: Safety glasses, goggles, or face shield required when transferring product.

SKIN: Insulated gloves should be worn, if contact with liquid or liquid cooled equipment is expected.

INHALATION: In atmosphere, where the concentration of propane would reduce oxygen level below 18% of inhaled air, self-contained breathing apparatus required.

VENTILATION: Explosion proof ventilation equipment.

WASTE DISPOSAL: Incinerate or ventilate to atmosphere with approval of environmental authority.

SECTION VIII - EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:

EYES: Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Get immediate medical attention.

SKIN: In case of "cold burn" from contact with liquid, immediately place affected area in warm water and keep at this temperature until circulation returns.

If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical attention.

INGESTION: None considered necessary.

INHALATION: Remove person to fresh air. Call a physician.

If breathing is difficult or has stopped, administer artificial respiration. Obtain immediate medical attention.

SPILL OR LEAK:

Eliminate leak if possible.

Eliminate sources of ignition.

Ensure cylinder is upright.

Disperse vapours with hose streams of water using fog nozzles, watch for low areas, as propane is heavier than air and can settle into low areas. Remain upwind of leak, keep people away.

Prevent vapour and/or liquid from entering into sewers, basements or confined areas.

SECTION IX - TRANSPORTATION HANDLING AND STORAGE

- Transport and store cylinders and tanks secured in an upright position in a ventilated space.
- Cylinders that are not in use must have the valves in the closed position, and be equipped with a protective cap or guard.
- Do not store with oxidizing agents, oxygen or chlorine cylinders.
- Transport, handle and store according to applicable Federal and Provincial regulations (CGA B149.2) and TDG.

- TDG Classification: 2.1
- TDG Shipping Name: Liquefied Petroleum Gas (Propane)
- TDG Special Provisions: 56, 102
- Product Identification Number UN 1075
- WHMIS Classification: Class A - Compressed Gas
Class B - Division 1 - Flammable Gas

SECTION X - PREPARATION INFORMATION

PREPARED BY: Safety Occupational Health & Environment Department

DATE: February 1, 1994

The information contained herein is believed to be accurate. It is provided independently of any sale of the product as part of ICG Propane Inc.'s product safety program. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability of fitness for a particular purpose is made with respect to the product information contained herein.

(MSDS 94.1) Supersedes (MSDS 91.1)

0296-006

EXHIBIT 1.1

PRODUCT NAME : AMMONIUM NITRATE, AN/FO

EMERGENCY CONTACT: 1-800-561-3636

HAZARD CLASS :

ICI Explosives Canada Inc.
P.O. Box 200, Station "A"
North York, Ontario
Canada, M2N 6H2

EMERGENCY CONTACTS

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL THE ICI CANADA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT 1-800-561-3636.

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: AMMONIUM NITRATE.

CAS Number: 6484-52-2
MSDS Number: 20010
MATS Index: 13589
Date Issued: 09-SEP-93

Product Use: Fertilizer, manufacture of explosives.

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENT(S)	% (w/w)	ACGIH TWA	CAS NO.
Ammonium Nitrate	95-100	Not Listed	6484-52-2

SECTION 3 - HAZARD IDENTIFICATION

Emergency Overview: Harmful if swallowed. Irritating to eyes, respiratory system and skin. May cause methemoglobinemia.

SECTION 4 - FIRST AID MEASURES

General: If you feel unwell seek medical advice (show the label where possible).

Inhalation: If respiratory problems arise, move the victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.

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EXHIBIT 1.4

Skin Contact: Wash affected areas thoroughly with soap and water. If irritation, redness, or a burning sensation develops and persists, obtain medical advice.

Eye Contact: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing and obtain medical attention.

Ingestion: If victim is alert and not convulsing, rinse mouth out and give 200-300 mL (1 cup) of water to dilute material. DO NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Obtain medical attention IMMEDIATELY.

Note to Physicians: Symptomatic. Administer oxygen if there are signs of cyanosis. If clinical condition deteriorates, administer 10 cc Methylene Blue intravenously. It is unlikely for this to be required with methemoglobin level of less than 40%.

SECTION 5 - FIRE-FIGHTING MEASURES

Flash Point: This product does not flash.
Flammable Limits (Lower): Not applicable.
Flammable Limits (Upper): Not applicable.
Auto Ignition Temperature: Not available.
Decomposition Temperature: 210°C
Rate of Burning: Not available.
Explosive Power: Not available.
Sensitivity to Mechanical Impact: Not expected to be sensitive to mechanical impact.
Sensitivity to Static Discharge: Not expected to be sensitive to static discharge.
Hazardous Reactions: See 'Fire and Explosion Hazards'.

Fire and Explosion Hazards: Attempts to smother a fire involving this product will be ineffective as it is its own oxygen source. This product may detonate if contaminated with organics or oxidizable material or if heated while confined. Unless the mass of product on fire is flooded with water, re-ignition is possible.

Extinguishing Media: Use water only, in as much volume as possible in order to cool the burning mass quickly. Chemical extinguishers are useless for this type of fire.

Fire Fighting Procedures: Use water spray or hose to cool fire-exposed containers or structures. Use self-contained breathing apparatus and protective clothing. Keep upwind and stay as far away as permissible while fighting the fire. Rapid reduction of temperature is the essence of the entire operation.

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EXHIBIT 1.4

Fire Fighting Protective Equipment: Use self-contained breathing apparatus and special protective clothing.

NOTE: Also see "Section 10 - Stability and Reactivity"

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Releases: Stop leak or spill. Sweep or shovel into containers for reclaim or disposal. Notify government authorities if spill is significant.

Deactivating Chemicals: Not required.

SECTION 7 - HANDLING AND STORAGE

Handling: Product is mildly corrosive to concrete and steel structures. Stainless steels and aluminum are adequate. Avoid copper and bronze made materials in storage and handling equipment.

Storage Requirements: Store in a cool, well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed.

Storage Temperature: Ideal storage temperature is 10-27°C. Do not expose sealed containers to temperatures above 40°C.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

PREVENTIVE MEASURES:

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: General ventilation is recommended.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Use chemical safety goggles when there is potential for eye contact.

Skin Protection: Gloves and protective clothing made from cotton should be impervious under conditions of use.

Respiratory Protection: A NIOSH/MSHA-approved respirator, if required.

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EXPOSURE GUIDELINES:

PRODUCT:

None established for product.

HAZARDOUS INGREDIENT(S):

None established for hazardous ingredients.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Alternate Name(s): Norway Saltpeter, AN-C Prills.

Chemical Name: Not available.

Chemical Family: Nitrate.

Molecular Formula: NH_4NO_3

Appearance: Free-flowing, hygroscopic, white or beige-coloured prills.

Odour: Odourless.

pH: 5.9

Vapour Pressure (mm Hg at 20°C): 0 (Ammonium Nitrate)

Vapour Density (Air=1): Not applicable.

Boiling Point: 210°C

Melting Point: 169°C

Freezing Point: 169°C

Solubility (Water): 79 %

Solubility (Other): Soluble in methyl alcohol and ethyl alcohol.

Specific Gravity: 1.725

Evaporation Rate: Not applicable.

% Volatile by Volume: 0 %

% Volatile Organic Compounds: 0 %

Molecular Weight: 80.06

Additional Properties: Boiling Point: 210°C @ 1.47 kPa. Bulk Density: 770-820 kg/m³.

SECTION 10 - STABILITY AND REACTIVITY

Hazardous Decomposition Products: Toxic gases and vapours (oxides of nitrogen) will be released by thermal decomposition (about 210°C). At higher temperatures, decomposition may be explosive, especially if confined.

Chemical Stability: Stable at room temperature.

Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition.

Incompatibility with other Substances: Avoid oxidizable materials, metal powder, copper, bronze, fuels (e.g. lubricants, machine oils), fluorocarbon lubricants, acids, corrosive liquids, chlorates, sulphur, charcoal, coke and other finely divided combustibles.

Hazardous Polymerization: Will not occur.

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SECTION 11 - TOXICOLOGICAL INFORMATION

Summary: May cause irritation. May cause methemoglobinemia.

TOXICOLOGICAL DATA:

PRODUCT:

None established for product.

INGREDIENTS:

Ammonium Nitrate:

Oral LD50 (rat) = 2217 mg/kg

Dermal LD50 (rabbit) = 3000 mg/kg

POTENTIAL HEALTH EFFECTS:

Inhalation: High concentrations of product is irritant to the respiratory tract.

Skin Contact: May cause skin irritation.

Eye Contact: Moderate irritant causing moderate initial pain.

Ingestion: Highly unlikely under normal industrial use. Ingestion may cause irritation of the gastrointestinal tract.

Subchronic Effects: If ingested, nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptoms of nitrite poisoning include methemoglobinemia, nausea, dizziness, increased heart rate, hypotension, fainting and, possibly, shock.

Chronic Effects: None known.

Carcinogenicity: The ingredient(s) of this product is (are) not classified as carcinogenic by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as carcinogens by OSHA (Occupational Safety and Health Administration), and not listed as carcinogens by NTP (National Toxicology Program).

Mutagenicity: There is no evidence of mutagenic potential.

Reproductive Effects: No information is available and no adverse reproductive effects are anticipated.

Teratogenicity and Fetotoxicity: No information is available and no adverse teratogenic/embryotoxic effects are anticipated.

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Synergistic Materials: None known.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicological Information: Toxic to aquatic life.

Environmental Effects: Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

SECTION 13 - DISPOSAL CONSIDERATIONS

Dispose of waste material at an approved landfill site in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

SECTION 14 - TRANSPORT INFORMATION

TDG Name: Ammonium nitrate or Ammonium nitrate fertilizers

TDG Class/Division: 5.1

Product Identification Number (PIN): UN1942 or UN2067, respectively

Packing Group: III

Transportation Emergency Telephone Number: 1-800-561-3636.

DOT Class: 5.1 - Oxidizer.

SECTION 15 - REGULATORY INFORMATION

CANADIAN CLASSIFICATION:

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.

Controlled Products Regulations (WHMIS) Classification: C: Oxidizer. D-2B: Toxic.

CEPA / Canadian Domestic Substances List (DSL): The substance(s) in this product is/are on the Canadian Domestic Substances List (CEPA DSL).

IARC Classification: None of the components of this product are listed on IARC.

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USA CLASSIFICATION:

Other Regulations/Legislation which apply to this product:
Massachusetts Right-to-Know, Pennsylvania Right-to-Know, New Jersey
Right-to-Know.

OSHA Classification:

Physical: Oxidizer.

Health: Irritant.

Target Organ: Blood/hematopoietic system.

SARA Regulations sections 313 and 40 CFR 372: This product
contains the following toxic chemical(s) subject to reporting
requirements: 100% Ammonium Nitrate (6484-52-2)

This product does not contain nor is it manufactured with ozone
depleting substances.

SECTION 16 - OTHER INFORMATION

REFERENCES:

RTECS-Registry of Toxic Effects of Chemical Substances, On-line
search, Canadian Centre for Occupational Health and Safety RTECS
database, Vol I-V, 1985-1986 edition, Doris V. Sweet, Ed., National
Institute for Occupational Safety and Health, U.S. Dept. of Health
and Human Services, Cincinnati, 1992.

Supplier's Material Safety Data Sheets.

"CHEMINFO", through "CCINFODisc", Canadian Centre for Occupational
Health and Safety, Hamilton, Ontario, Canada.

Sax, N. Irving, Dangerous Properties of Industrial Materials, 7th
ed., Van Nostrand Reinhold Co., New York, 1989.

Windholz, Martha, Ed., The Merck Index, 10th ed., Merck and Co.
Inc., Rahway, New Jersey, 1983.

Prepared by: Safety, Health and Environment (416) 229-8252

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QZ96-006

EXHIBIT 1.4

on any information contained herein. This Material Safety Data Sheet is valid for three years.

QZ96-006
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PRODUCT NAME : MOTOR OIL

EMERGENCY CONTACT: (519) 339-2145

HAZARD CLASS :

Date Prepared: May 26, 1994
Supersedes: July 26, 1993
MSDS Number: 223170

Cette fiche signalétique est aussi disponible en français

1. PRODUCT INFORMATION

Product Identifier: ESSOLUBE XD-3 EXTRA 5W-30

Application and Use:
Premium quality universal engine oil for use in severe service,
heavy duty, diesel and gasoline engines

Product Description:

A lubricating oil consisting of a mixture of saturated and unsaturated hydrocarbons derived from paraffinic distillate, and additives.

REGULATORY CLASSIFICATION

WHMIS:

Not a controlled product

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT

All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TRANSPORTATION OF DANGEROUS GOODS INFORMATION

Shipping Name: Petroleum Lubricating Oil
Class: Not regulated Packing Group: Not regulated
PIN Number: Not regulated Guide Number: 129

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 868-4111

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 11.80 cSt at 100 deg C
Vapour Density: not available
Boiling Point: 317 to 615 deg C
Evaporation rate: < 0.1 (1 = n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -42 deg C D87
Odour Threshold: not available
Vapour Pressure: < 1 kPa at 38 deg C
Density: 0.87 g/cc at 15 deg C
Appearance/odour: Deep brown liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.

INGESTION:

Low toxicity.

CHRONIC:

Prolonged and/or repeated contact with used gasoline engine oil has caused skin cancer in experimental animals. The relationship of these results to humans has not been fully established.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:
Oral : LD50 > 5000 mg/kg (Rat)
Dermal : LD50 > 3180 mg/kg (Rabbit)
Inhalation : LC50 > 5000 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For oil mists, 5 mg/m3.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

Vapour pressure of this material is low and as such inhalation under normal conditions is usually not a problem. If overexposed to oil mist, remove from further exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
Where prolonged and/or repeated skin and eye contact is likely to occur, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear safety glasses with side shields.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials. In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Do not breathe gas, vapour or mist.
Do not handle or store near an open flame, sources of heat, or sources of ignition.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

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Please turn over



MATERIAL SAFETY DATA SHEET

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Recover by pumping or by using a suitable absorbent. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 200 deg C COC D92

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.

Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.

Shut off fuel to fire.

Use foam, dry chemical or water spray to extinguish fire.

Respiratory and eye protection required for fire fighting personnel.

Avoid spraying water directly into storage containers due to danger of boilover.

A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

9. NOTES

10. PREPARATION

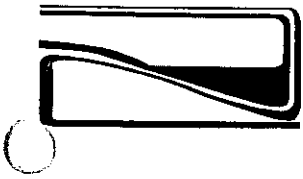
Date Prepared: May 28, 1984
Prepared by: LUBRICANTS AND SPECIALTIES
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

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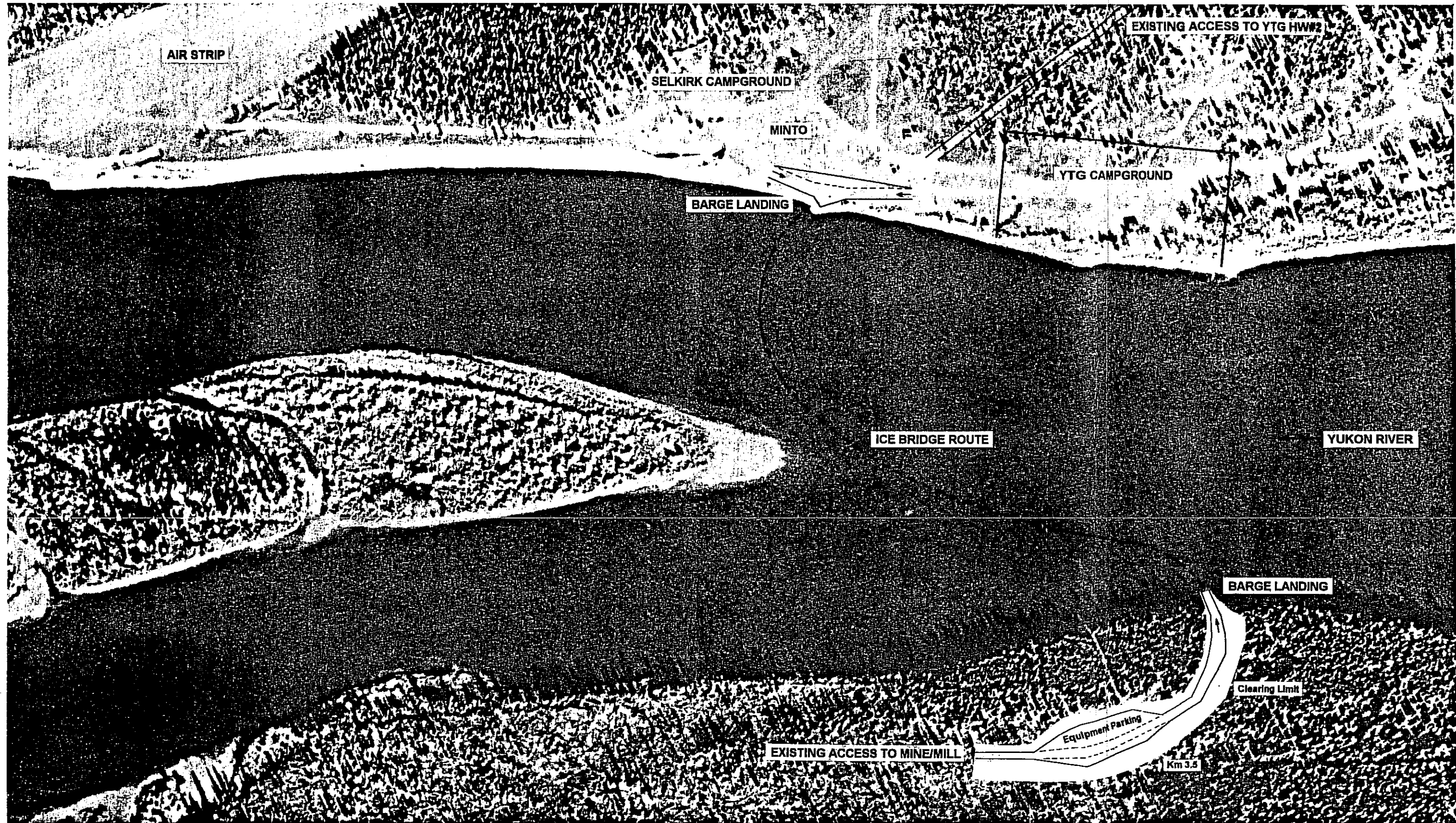
**Yukon
Territory
Water Board**

**Office des eaux
du Territoire
du Yukon**

PLEASE NOTE

This over-sized Arial Photograph Mosaic is of poor quality and cannot be reproduced. It can be viewed at the Yukon Territory Water Board Office.

REVISION	BY	DATE	MINTO EXPLORATIONS LTD.	
			MINTO PROJECT, YUKON Aerial Photograph Mosaic Of Project Area QZ96-006 EXHIBIT 1.4	
BY: jsp	DRAWING NO:	SCALE:	1 inch = 3100 feet; 1 : 37200	
96/02/28	Figure 1	PROJECT:	Project Area	



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MINTO EXPLORATIONS LTD.

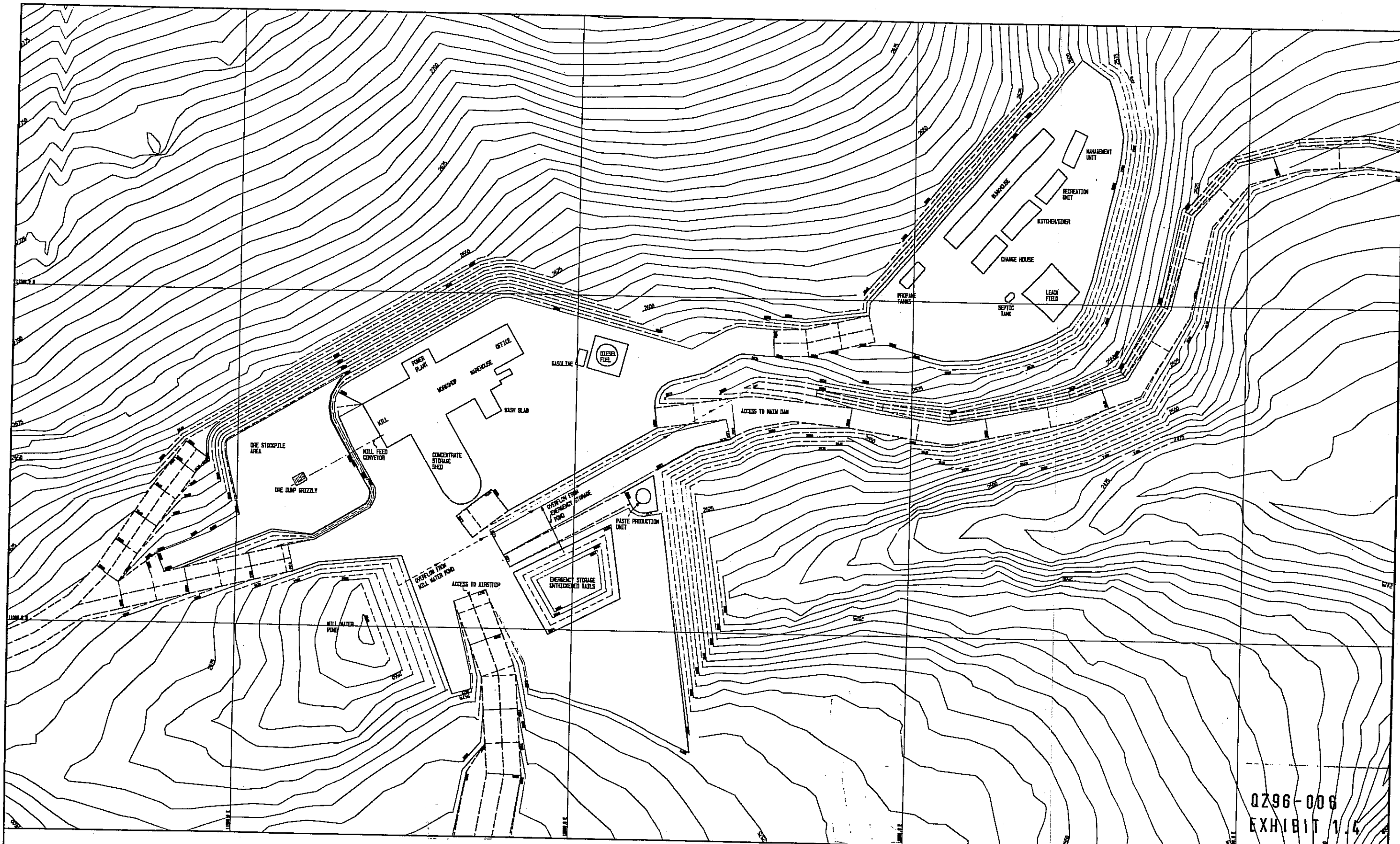
MINTO PROJECT, Yukon
Barge Landings, Photo A28248

DATE: 97/03/20

DRAWING NO:

SCALE: 1 Inch = 250 Feet

Figure 2



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Vancouver Office
6411 Imperial Avenue
West Vancouver, BC
V7W 2J5

DATE: 02/13/91 TIME: 09:27:26

1	
2	
3	
4	
5	

Minto Explorations Ltd.

MINTO PROJECT, Yukon
MINE LAYOUT (Mill / Camp Detail)

Figure 3

SAFETY IS UP TO YOU

Remember that on any job, YOU are the key to safety. Good safety practices not only protect the workers around you - they are your own best protection.

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