Mount Nansen Project

Update to Water Licence Application QZ94-004
Supporting Documentation

Volume II of II
Sections V through XVII

Submitted to:

Yukon Territory Water Board

Submitted By:

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December 1st 1995

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VOLUME I

VOLUME II

General

DIAND produced the final Screening Report, dated November 15, 1995 resulting from their environmental assessment carried out under the federal Environmental Assessment and Review Process Guidelines Order (EARPGO) of BYG Natural Resources Inc.'s Mount Nansen Project.

In the report DIAND addressed all of the concerns, voiced to date, about the project and, where DIAND felt that the concerns had been adequately addressed by BYG said so, and where DIAND felt the concerns had not been adequately addressed, made recommendations for those concerns to be addressed in the Water License Application or in supplemental material to that application.

BYG has now prepared further documentation and made further commitments, in addition to those already encompassed in the Water License Application, in order to adequately deal with these concerns.

All of DIAND's recommendations and BYG's response to those recommendations are listed below by section.

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SECTION V

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SPILL CONTINGENCY PLAN

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SAFETY DATA & MATERIAL SAFETY DATA SHEETS

SECTION A

SCOPE AND PURPOSE OF SPILL CONTINGENCY PLAN

A.1 GENERAL

B.Y.G. Natural Resources Inc. Spill Contingency Plan outlines response strategies to spills of potentially hazardous substances at and near the mine site, on the access road, on the mill site access road and on the mill site area, which may affect the environment. This documented plan will facilitate the rapid deployment of personnel and resources to spills, so that the environmental impact and risk are minimized and that the health and safety of the workers and public are protected.

It is intended that B.Y.G. Natural Resources Inc. Mount Nansen Mine personnel be familiar with this document, potential hazards, relative responsibilities of each of the team members, resources available, reporting procedures, and the action to be taken for respective substances.

The Spill Contingency Plan has been prepared in accordance with the Spill Response Contingency Planning Guidelines set by the Yukon Environmental Protection, Department of Environment and is consistent with the authority of the Ministry under the Yukon Waste Management Act. Recent Regulations under the Federal Transportation of Dangerous Goods Act are referred to within the plan.

A.2 POLICY STATEMENT

B.Y.G. Natural Resources Inc. recognizes that the maintenance of environmental quality is vital to the Company's existence, progress, and continued development. The Company will maintain high environmental standards limited, as necessary, by technical and economic feasibility. The Company will take positive action to protect the safety of its workers, conserve natural resources, and minimize the impact of its activities on the environment through application of appropriate technology and responsible conduct, at all stages of exploration, mine development, mining, mineral processing, decommissioning, and reclamation.

The purpose of B.Y.G. Natural Resources Inc.'s Environmental Policy is to provide a measurable framework for the performance of the Company's activities in an environmentally responsible manner, and to ensure compliance by the Company and its employees with all applicable environmental regulations and commitments.

Implementation

B.Y.G. Natural Resources will:

- Evaluate, plan, construct, and operate all projects and facilities to reduce adverse environmental impacts and to meet or exceed applicable environmental laws, regulations and standards. In the absence of applicable regulations, the Company will apply cost effective and sound management practices to protect the environment.

- Require managers of all projects and operations to identify, evaluate and minimize risks to the environment.

- Require all operations to have site specific emergency response plans which meet or exceed all applicable regulations.

- Regularly verify compliance with the Company's policy and applicable regulations. Identify revisions or improvements to current practices in order to minimize environmental impacts. Report findings to the Board of Directors quarterly.

- Educate employees in environmental matters and responsibilities relating to performance of their assigned tasks. Entrust each lime manager with the responsibility to adhere to the Company Environmental Policy and for the environmental performance of his or her activity.

- Foster communication with shareholders, members of the public, employees, and government to enhance understanding of environmental issues affecting the Company's activities.

- Work cooperatively with government and the public to define environmental priorities. Participate in the development of responsible laws for the protection of the environment.

- Allocate sufficient resources to meet the Company's environmental goals. Annually assess the projected costs of decommissioning and reclamation while funding "off balance sheet" an appropriate amount to ensure that there is sufficient cash reserves to pay for these future costs.

A.3 CHEMICAL SUBSTANCES UTILIZED

A mining and milling operation utilizes a number of chemical substances in varying quantities. Primary emphasis has been placed on those chemicals which by virtue of the large quantities used, combined with their high toxicity or complex cleanup warrant special attention. In order of priority, this includes:

a) **Large Scale Usage**

1. Sodium Cyanide
2. Diesel Fuel
3. Lime
4. Sulfur Dioxide

b) **Smaller Scale Usage**

1. Copper Sulfate
2. Hydrochloric Acid
3. Sodium Hydroxide
4. Propane
5. Gasoline
6. Antifreeze
7. Greases, hydraulic fluids and lubricating oils
8. Waste oil from mobile equipment - collected and shipped to recycling facilities in Quesnel
9. Cleaning agents and solvents.

c) **Non-Toxic Chemicals**

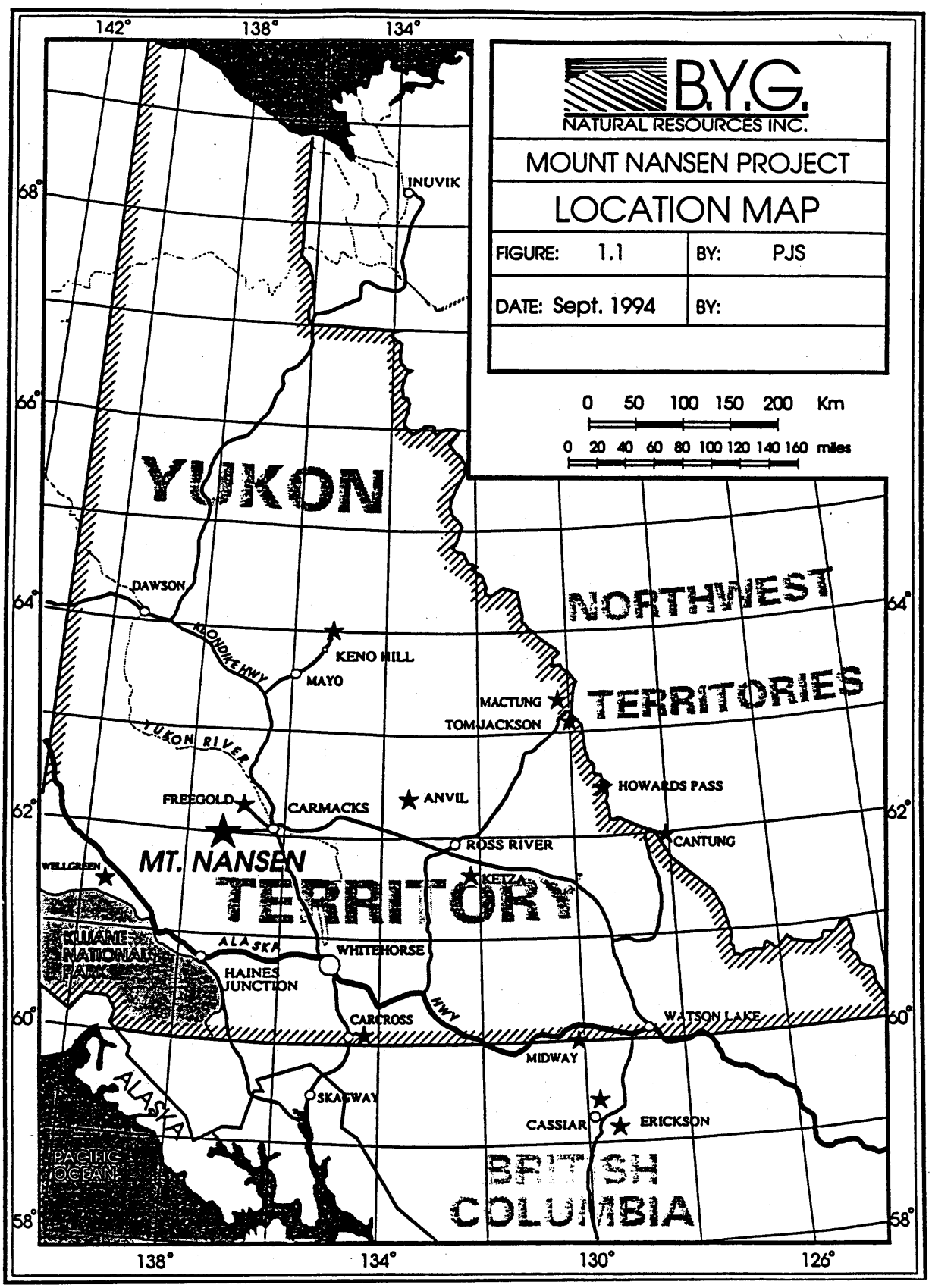
1. Polyacrylamide flocculants, used as coagulating agents, are environmentally safe polymers used for removal of suspended solids in thickener.
2. Gold refining fluxes such as silica flour, borax, soda ash are relatively inert, used in small quantities, are of low or no toxicity and are easily cleaned up if spilled.

A.4 Reagent Deliveries

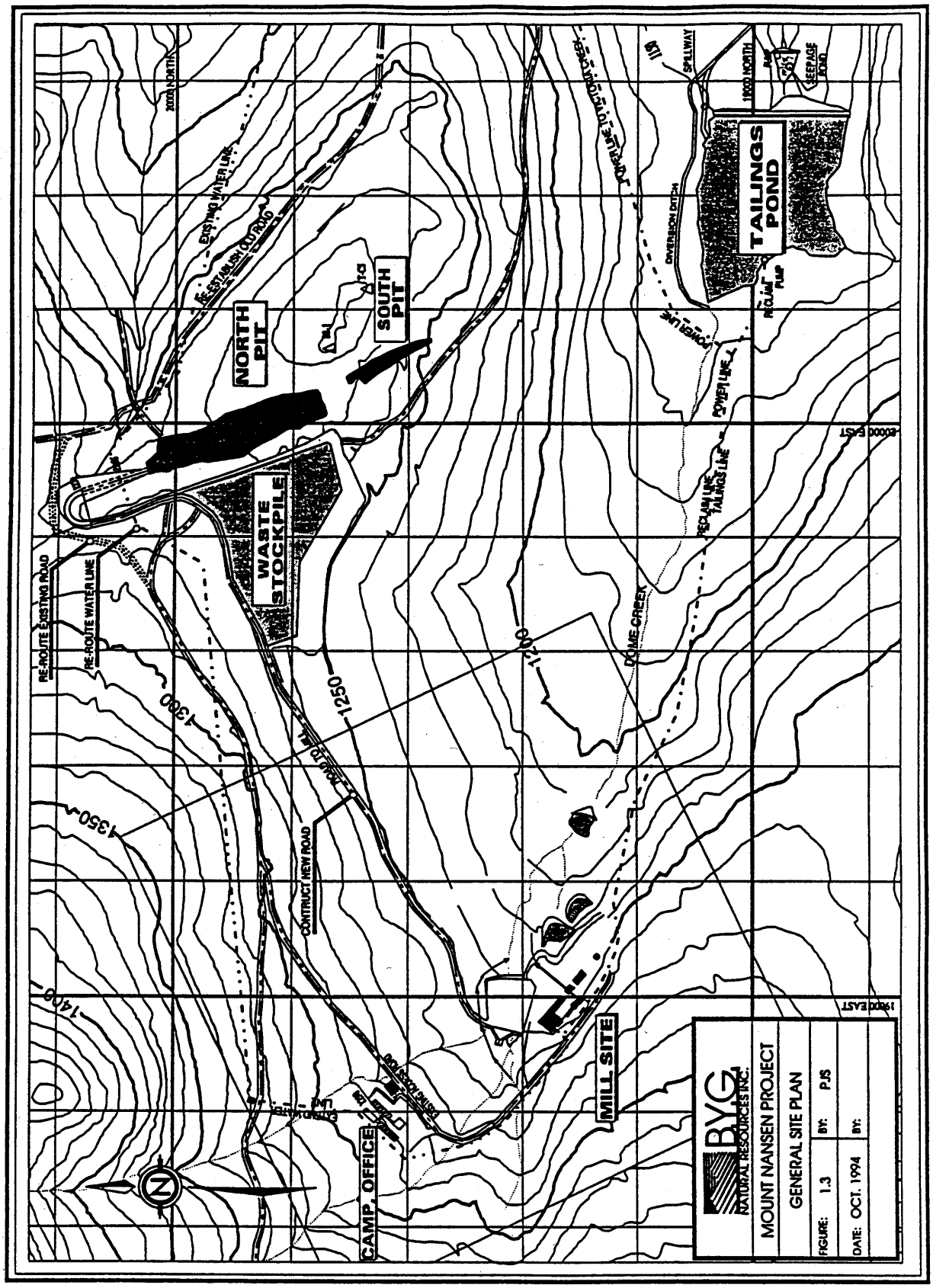
B.Y.G. Natural Resources Inc.'s, Mount Nansen Mine will assist with clean of spills of substances destined for the mine within reasonable proximity of the mine site. It is B.Y.G. Natural Resources Inc.'s policy in its contractual arrangements with chemical and fuel suppliers to take possession of the supplies only upon delivery at the mine. It is also Company policy to purchase chemicals and fuels only from suppliers which have the resources to adequately respond to spills, and have filed Contingency Plans under the Transportation of Dangerous Goods Act for designated substances.

B.Y.G. Natural Resources Inc. will assist in notifying regulatory agencies of a spill and provide manpower and resources for clean-up; the Company assumes no liability with respect to spills connected with transportation incidents prior to delivery by the consignor.

A.5 Location Map and Site Plan



A.6 General Site Plan



SECTION B

ORGANIZATION AND RESPONSIBILITIES

Spills of chemicals, fuels and other substances may occur as isolated events or they may occur with other emergencies such as fire, explosion, natural causes or accident.

A number of response personnel may be involved to protect mine property and the health and safety of mine personnel and the public.

- The key persons involved during a spill occurrence would be as follows:
- The person discovering the spill, and his Supervisor,
- The General Manager;
- The Mine Manager (if a mine site or mine access road spill)
- The Environmental Coordinator;
- The On-Scene Coordinator (OSC);
- The Response Team Leader (RTL); and
- The Clean-up crews.

The responsibilities of each of these persons are discussed on the following pages, names and telephone numbers are kept current at all times at the mine site.

B.1 RESPONSIBILITIES OF PERSON DISCOVERING THE SPILL

a. Assess the hazard to one's own health and safety and to others in the vicinity. If the risk of gas poisoning exists, determined with the use of Gastech equipment, or if fire or explosion hazards are perceived, then leave the area and warn others to leave also.

b. Notify your Supervisor IMMEDIATELY.

c. Arrange for appropriate operating equipment to be shut down, if applicable, to minimize the extent of the spill.

d. If warranted, notify on-site Industrial First Aid persons for first aid. Fire fighting response will be coordinated by Supervisor in attendance backed up by Mine Rescue personnel and any other available personnel.

e. The General Manager and, if on the mine site or mine access road, The Mine Manager must be contacted IMMEDIATELY by the Supervisor or the person discovering the spill with the following information:

- **Name of person discovering the spill.**
- **The time of the spill.**
- **The location of the spill.**
- **The type of substance spilled.**
- **The quantity of substance spilled.**
- **The cause of the spill.**
- **The weather conditions.**
- **Perceived potential for hazard, and any injury to aquatic systems, wildlife or people.**
- **Actions already taken.**
- **Whether a fire or explosion hazard is deemed to exist.**
- **Persons already notified.**

f. Ensure every remedial action is taken, safely, to stop and minimize the extent of the spill. The Supervisor should remain on-site.

B.2 RESPONSIBILITIES OF THE GENERAL MANAGER AND MINE MANAGER

Manager — Home Ph: 863 5913

Business: 863 5913

a) Immediately inform:

1. The On-Scene Coordinator (OSC)

Home Ph:

Bus. Ph:

OSC Backup

Home Ph:

Bus. Ph:

Home Ph:

Bus. Ph:

2. The Territorial 24 Hour Emergency Response Number,

   1-403-667-7244 (24 Hour Emergency Number)

3. G. C. Dickson

   Project Metallurgist Bus. Ph:604-469-1524

   or

4. James B. Smith

   Vice President, C.O.O., Canada Bus. Ph:604-4693-1524

b. Plan for disposal of the recovered spill material.

c. Upon completion of the cleanup and restoration actions, prepare a Spill Report.

d. Keep a complete log of events and activities during and after the spill, and photographs if possible, for legal purposes and critical review of events at a later date.

B.3 RESPONSIBILITIES OF THE ON-SCENE COORDINATOR (OSC)

Upon receiving a report of a spill, the OSC will carry out the following:

a. If injury, serious health threats exist, or potential equipment hazards exist, call the Site Manager if the person reporting the spill has not already done so.

b. Consult the appropriate ACTION PLAN contained in this manual, to review the properties of the spilled material and recommended response actions. If further information is required, contact one of the resource services listed in Section D of this manual.

c. Assess the spill requirements for manpower, equipment, materials, tools and protective gear to contain the spill, in consideration of the resources available. Mobilize these resources and take responsibility for implementation of the response actions in the spill site.

d. If the spill is too large or complex to be handled entirely by the Company's resources, call an appropriate group or agency listed in Section E of this plan.

e. Contact the Environmental Coordinator to determine what, if any, sampling should be done and to discuss the spill and any environmental implications.

f. Once the initial response action is underway, contact the General Manager and, if on the mine site or mine access road, the Mine Manager and review the situation and strategy.

B.4 RESPONSIBILITIES OF THE SITE CREW

a. Deploy response crews and equipment operators to undertake the actual cleanup and supervise their work.

b. Maintain responsibility for the activities at the site of the spill.

c. Maintain contact with and coordinate work with the Environmental Coordinator.

B.5 DUTIES OF ENVIRONMENTAL COORDINATOR NOT RELATED TO SPILL EVENT

a. Update the Spill Contingency Plan as required, for all potentially hazardous materials, accurate names of personnel and phone numbers.

b. Plan and CO-ordinate required skills.

c. Be responsible for assessing new spill hazards as they develop and take preventative actions, whether covered in the manual or not.

d. Check and maintain the operating status of required response equipment which may be required at a spill.

e. Train emergency response personnel with respect to their duties.

SECTION C

GOVERNMENT NOTIFICATION PROCEDURE

C.1 MINE SITE SPILLS

Although several government agencies at the municipal, provincial and federal levels may ultimately be involved, only one government contact is required to be made by the On Scene Coordinator or his backup for the mine site spills:

Contact: TERRITORIAL 24 HOUR EMERGENCY RESPONSE NUMBER

1-403-667-7244

This is a 24 hour number the Department of the Environment will notify all concerned agencies, including the following, as appropriate:

a. The RCMP.

b. Environmental Protection

c. Ministry of Health

d. Environment Canada

e. Any other relevant agencies.

The notification of downstream water users, if required, is normally the responsibility of Environmental Protection, as further discussed in Section I of this plan.

C.2 TRANSPORTATION SPILLS

In the case of a transport related accident, "dangerous occurrence" (as defined below) must be reported immediately to:

a. 24 Hour Emergency response number.

b. The nearest R.C.M.P. detachment.

b. The employer.

c. The owner of the transport trucks.

d. The owner or consignor of the dangerous goods.

A "dangerous occurrence" is considered to be:

a. Any loss of dangerous goods in excess of specified amounts or which represents a danger;

b. Damage to any container of dangerous goods;

c. A transportation accident in which radioactive goods are involved;

d. An unintentional explosion or fire involving dangerous goods.

While it is the responsibility of the transporter of the goods to report this type of incident, mine site personnel should ensure that it has been carried out properly.

More information on the reporting of a dangerous occurrence is provided in Appendix 4, Section 9 of the Transportation of Dangerous Goods Regulations.

APPENDIX 4

SECTION 9 OF TRANSPORTATION OF DANGEROUS GOODS REGULATIONS

"9.1 For the purposes of this Part "dangerous occurrence" means

a) where dangerous goods are included in a class and a division, if any, set out in column 1 of an item of Table 1 to this Part, a discharge, emission or escape from any container, packaging or means of transport that contains the dangerous goods, which discharge, emission or escape

i) is in a quantity or at a level set out in column II of that item, and

ii) represents a danger to health, life, property or the environment.

b) a transportation accident in which any means of bulk containment that contains dangerous goods is damaged.

c) a transportation accident involving dangerous goods included in Class 7, or

d) an unintentional explosion or fire involving dangerous goods;

"employer" includes a person who

a) employs one or more individuals, or

b) provides the services of one or more individuals;

"importer" means any person

a) on whose behalf an international consignment or a transborder consignment of dangerous goods is ordered or is otherwise caused to be brought into Canada, or

b) who is acting on behalf of a foreign consignor or consignee of an international consignment or transborder consignment of dangerous goods being transported through Canada from a place outside Canada to a place outside Canada.

9.2 No person shall handle, offer for transport or transport dangerous goods unless he

a)is a trained person, or

b)is performing those activities under the direct supervision of a trained person.

9.3 For the purposes of this Part, a person is a trained person in the aspects of handling, offering for transport or transporting of dangerous goods related to his assigned duties

a) when his employer

i) is satisfied that the person has received adequate training in the aspects of the handling, offering for transport or transporting of dangerous goods related to the duties that he proposes to assign to the person, and

ii) issues to the person a Certificate of Training that indicates

A) the date the person completed an initial training in the handling, offering for transport or transporting of dangerous goods.

B) the date the person completed each subsequent training in the handling, offering for transport or transporting of dangerous goods, if any, and

C) the aspects of the handling, offering for transport or transporting of dangerous goods for which the person was trained, and

b) when the person is the holder of a certificate, license or authorization recognized under

i) the Ships' Deck Watch Regulations,
ii) The Pest Control Products Act,
iii) the Regulations No.0-8, Uniform Code of Operating Rules, or
iv) the Atomic Energy Control Act.

and the certificate, license or authorization relates, at least in part, to the aspects of handling, offering for transport or transporting of dangerous goods that are applicable to his assigned duties.

9.4 (1) Subject to subsection (3) where the Certificate of Training referred to in subparagraph 9 3(a)(ii) is issued to a person who is

a) a member of an air crew, or

b) a member of the personnel who handle luggage or freight at an aerodrome,

the Certificate is valid for a period of 12 months after the person has completed

c) initial dangerous goods training, or

d) subsequent dangerous goods training.

(2) Subject to subsection (3), where the Certificate of Training referred to in subparagraph 9 3(a)(ii) is issued to any person, other than a person referred to in subsection (1), the Certificate of Training is valid for a period of 36 months after the person has completed

a) initial dangerous goods training, or

b) subsequent dangerous goods training.

(3) Where a person who holds a Certificate of Training completes subsequent dangerous goods training during the period

a) starting at the beginning of the calendar month immediately preceding the calendar month of the expiration of his certificate of training, and

b) ending at the end of the calendar month immediately following the calendar month of the expiration of his certificate of training,

the person is deemed to have completed the subsequent dangerous goods training during the calendar month of the expiration of his certificate of training.

9.5 On request by an inspector, a trained person shall produce

a)a certificate of training issued to him pursuant to subparagraph 9.3 a(ii), or

b)a certificate license or authorization referred to in paragraph 9.3(b).

"9.6Every employer who issues a certificate of training to a trained person shall retain a copy of the certificate of training for a period of two years from the date of the expiration of the certificate."

9.7 The training referred to in subparagraph

9.3(a)(i) shall be directly related to the dangerous goods that the person is expected to handle, offer for transport or transport during the performance of his proposed duties and shall include, as applicable, one or more of the following topics

a)the classification, nature and characteristics of those dangerous goods;

b) the packaging requirements for those dangerous goods;

c) the safety marking requirements for those dangerous goods;

d)the documentation requirements for those dangerous goods;

e)the applicable special precautions for the handling or transporting of those dangerous goods prescribed by the manufacturer or the Regulations;

f)the reporting requirements pursuant to this Part;

g)the applicable emergency action in case of a dangerous occurrence referred to in subsections 17(1) and (2) of the Act;

h)the nature and proper utilization of equipment available for handling or transporting those dangerous goods; and

i)the conditions, circumstances and manner in which safety equipment made available to the person should be used.

Registration

9.8 (1) Subject to subsection (2)

a) every Canadian manufacturer of dangerous goods that offers for transport dangerous goods, or

b) every importer to Canada of dangerous goods.

"that are in bulk, or are in quantities exceeding 500 kg shall register with the Director General by providing the Director General with the information required in Form 1 set out in Schedule IX."

(2) Subsection (1) does not apply in the case of dangerous goods that are

a) included in Class 1, if the manufacturer or the importer holds a license issued pursuant to the Explosives Act;

b) included in Class 7, if the manufacturer or the importer holds a license issued pursuant to the Atomic Energy Control Act; or

c) pesticides, if the manufacturer or importer has registered them pursuant to the Pest Control Products Act.

9.9 Every Canadian manufacturer or importer referred to in subsection 9.8(1) shall provide the Director General with the information referred to in that subsection

a) once every five years, after the first registration, or

b) once in every calendar year in which there is a change in the information previously submitted."

Notification of Lost, Stolen or Misplaced Goods

9.10 Where a person discovers that all or part of a consignment of dangerous goods has been lost, stolen or misplaced

a) in the case of dangerous goods included in Class 1 Division 2 of Class 6 or Class 7, the person shall immediately report the discovery to the local police; and

b) in the case of dangerous goods included in Division 2 of Class 6, the person shall immediately cause the discovery to be reported to CANUTEC at (613) 996-6666.

Delay in Delivery of Explosives

9.11 (1) For the purpose of subsection (2), "Set off" means detached from a train and left at a siding.

(2) Where a road vehicle or rail vehicle transporting explosives of Classification 1.1, 1.2, 1.3 or Compatibility Group 1 of Classification 1.4 is involved in an accident, fire or another incident that causes

a) a delay in the delivery of the explosives other than delay due to a vehicle mechanical breakdown;

b) damage to the vehicle or to the explosives, or

c) a railway car to be set off at any intermediate point

the person who has the charge, management or control of the vehicle shall notify

d) immediately the local police;

e) the owner of the vehicle; and

f) in the case of a railway vehicle, the Railway Transport Committee of the Canadian Transport Commission.

In-flight Emergency

9.12 Where an in-flight emergency occurs on board an aircraft that is transporting dangerous goods, the pilot-in-command shall, to the extent possible, notify an air traffic control unit or a flight service station that dangerous goods are on board indicating, in respect of the dangerous goods.

a) the product identification number;

b) the shipping name;

c) "the primary classification,

d) the subsidiary classification, if any",

e) where the dangerous goods are included in Class 1, the compatibility group;

f) the quantity, and

g) the location of the dangerous goods in the aircraft.

Dangerous Occurrence Immediate Reporting

9.13 A person who has the charge management or control of dangerous goods at the time he discovers or is advised of a dangerous occurrence in respect of those goods shall immediately notify or cause to be notified

a) "the appropriate authority of the province in which the goods are located by calling the authority or telephone number specified for that province in column II of Table II to this Part."

b) where a railway vehicle is involved, the Canadian Transport Commission;

c) where a ship is involved

i) the nearest Canadian Cost Guard Ship Safety Office, and

ii) the regulatory authority of the nearest port, harbor, wharf or place;

d) where an aircraft is involved or the occurrence takes place at an airport, the Canadian Air Transportation Administration of the Department of Transport;

e) his employer,

f) "where a road vehicle is involved, the owner, lessee or charterer of the road vehicle, and"

g) the owner or the consignor of the consignment of dangerous goods.

Dangerous Occurrence 30 Days Reporting

9.14 The employer of a person who has the charge, management or control of dangerous goods at the time of

a) the discovery of a dangerous occurrence relating to those goods,

b) "an accident in which there is a release of the dangerous goods and a person is killed or is injured seriously enough to require hospitalization;

c) the discovery of damage to the integrity of any pressurized means of containment of the dangerous goods;

d) the suspicion that the container that contains the dangerous goods has suffered damage to its integrity resulting from impact, stress or fatigue, or

e) the discovery that all or part of a consignment of dangerous goods included in Class 1 or 7 has been misplaced, lost or stolen"

shall, within 30 days of that time, notify the Director General by providing the Director General with the information required in Form 2 set out in Schedule IX.

TABLE II

Notification to Provinces

Item	Column 1	Column 11
	Province	Emergency Authority or Telephone Number
1	Alberta	Local police
2	British Columbia	Local police or (604) 387-5956
3	Manitoba	Local police or fire brigade, as appropriate, or (204) 944-4888
4	New Brunswick	Local police or Zenith 49000*
5	Newfoundland	Local police or (709) 772-2083
6	Northwest Territories	(403) 873-7554
7	Nova Scotia	Local police or Zenith 49000* or (902) 426-6030
8	Ontario	Local police
9	Prince Edward Island	Local police or Zenith 49000*
10	Quebec	Local police
11	Saskatchewan	Local police or 1-800-667-3503**
12	Yukon Territory	(403)667-7244

* **This telephone number is not accessible from outside the provinces of New Brunswick, Nova Scotia or Prince Edward Island.**

** **This telephone number is not accessible from outside Saskatchewan.**

DANGEROUS GOODS CLASSIFICATION

TABLE I

SCHEDULE IX

	PRIMARY	SUBSIDIARY
SODIUM CYANIDE	6.1	9.2
DIESEL FUEL	3.2	
GASOLINE	3.1	
SULFUR DIOXIDE	2.3	
HYDROGEN PEROXIDE	5.1	
AMMONIUM NITRATE AQUEOUS SOLUTION	5.1	8
COPPER SULFATE	9.2	
LEAD NITRATE	5.1	6.1, 9.2
MURIATIC ACID	8	9.2
ZINC DUST	4.3	4.2
QUICKLIME	8	
PROPANE	2.1	
LUBRICATING OILS	?	

C.3 SPILL REPORTING SECTIONS AND REGULATIONS

STATUTES OF THE YUKON

ENVIRONMENT ACT

Sections 132 to 139 and 147

and Special Waste Regulations

the regulations or approved or customarily used for that purpose by the manufacturer and that bears a label meeting any requirements prescribed under this Act.

(2) Subsection (1) does not apply to storing or keeping pesticides in tanks or machines that are used for mixing, holding, or applying pesticides.

Disposal of pesticides

128. Subject to the regulations, no person shall

(a) dispose of a pesticide or of a mixture containing a pesticide; or

(b) dispose of any container that has been used to hold a pesticide,

except at a site or in a manner that is prescribed by regulation or is recommended by the manufacturer of the pesticide.

Putting pesticides in an open body of water

129.(1) No person shall put or cause the putting of a pesticide or any substance containing a pesticide into, on, or over an open body of water without a permit.

(2) In this section, "open body of water" means a river, stream, watercourse, bay, estuary, lake, reservoir, dugout, or other body of water, whether it contains water continuously or intermittently, and whether it is frozen or not.

Licensing of businesses to apply and use pesticides

130. No person shall apply or use a pesticide for hire or reward without a permit.

Applying pesticides from aircraft

131. No person shall apply a pesticide from an aircraft without a permit.

PART 11
SPILLS

Definition

132. In this Part,

approuvé et utilisé habituellement à cette fin par le fabricant et portant une étiquette conforme aux exigences de la présente loi.

(2) Le paragraphe (1) ne s'applique pas à l'entreposage de pesticides dans des réservoirs ou des machines servant à leur mélange, rétention ou application.

Élimination des pesticides

128. Sous réserve des règlements, nul ne doit éliminer un pesticide ou un mélange contenant un pesticide ou un contenant qui a servi à contenir un pesticide, sauf en un lieu ou manière prévus par règlement ou recommandés par le fabricant.

Déversement de pesticides dans une étendue d'eau

129.(1) Nul ne doit, sans permis, verser ou faire en sorte que soit versé un pesticide ou une matière contenant un pesticide dans une étendue d'eau.

(2) Dans le présent article, s'entend d'étendue d'eau, une rivière, un ruisseau, un cours d'eau, une baie, un estuaire, un lac, un réservoir, une fosse ou toute autre masse d'eau contenant de l'eau continuellement ou de façon intermittente et qu'ils soient gelés ou non.

Délivrance de licences aux entreprises pour appliquer et utiliser des pesticides

130. Nul ne doit appliquer ou utiliser des pesticides contre rémunération sans un permis.

Application de pesticides à partir d'un aéronef

131. Nul ne doit, sans permis, appliquer un pesticide à partir d'un aéronef.

PARTIE 11
DÉVERSEMENTS

Définition

132. La définition suivante s'applique à la présente partie :

"spill" means a release of a substance

(a) into the natural environment;

(b) from or out of a structure, vehicle or other container; and

(c) that is abnormal in quantity or quality in light of all the circumstances of the release; or

(d) in excess of an amount specified in the regulations. *déversement*

"substance" means a hazardous substance, pesticide, contaminant or special waste.

Report of spill

133. A person in control of a substance at the time of a spill or who causes a spill shall report the spill, as soon as possible under the circumstances, to an environmental protection officer and shall make a reasonable effort to notify the owner or person in charge of the spilled substance and any members of the public who may be adversely affected by the spill.

Contents of report

134. The person who is required to report pursuant to section 133 shall report in person or by telephone, and shall, where he or she has knowledge of the information or can readily obtain it, provide the following information

(a) the location and time of the spill;

(b) a description of the circumstances leading up to the spill;

(c) the type and quantity of the material or substance which has spilled;

(d) the details of any action taken at the site of the spill;

(e) a description of the location of the spill and the immediately surrounding area; and

(f) any additional information in respect of the spill that the Minister, environmental protection officer or person designated by the regulations requires.

«déversement» Rejet dans l'environnement naturel d'une substance dont l'évacuation hors d'un ouvrage, véhicule ou autre contenant présente des caractéristiques quantitatives ou qualitatives anormales, compte tenu des circonstances s'y rapportant, ou se fait en quantité excédant les maximums réglementaires. *spill*

Rapport de déversement

133. Quiconque a le contrôle d'une substance au moment de son déversement ou fait en sorte qu'elle soit déversée est tenu de faire rapport de l'incident, dans les meilleurs délais possible, à un agent de protection de l'environnement et de s'efforcer de le notifier au propriétaire ou au responsable de la substance déversée et à toute personne à qui le déversement pourrait causer un préjudice.

Teneur du rapport

134. La personne visée à l'article 133 fait rapport de l'incident, en personne ou par téléphone, et inclut dans son rapport, lorsqu'elle les détient ou peut les obtenir sans difficulté :

a) le lieu et le moment du déversement;

b) les circonstances s'y rapportant;

c) le type et la quantité de la matière déversée;

d) le détail des mesures correctives prises sur place;

e) une description du lieu où s'est produit le déversement et des environs immédiats;

f) toute autre donnée exigée par le ministre, l'agent de protection de l'environnement ou la personne désignée par règlement.

Duty to mitigate

135. Where a spill occurs, the person who owns or has possession, charge or control of the spilled substance at the time of the spill shall, when he or she has knowledge of the spill,

(a) take all reasonable measures

(i) to confine, repair, and remedy the effects of the spill; and

(ii) to remove the substance spilled in such a manner as to reduce or mitigate any danger to human life, health and the natural environment; and

(b) restore or rehabilitate the natural environment to a condition reasonably equivalent to the condition that existed immediately before the spill occurred.

Environmental protection orders relating to spills

136. Where there has been a spill, the Minister or an environmental protection officer may issue an environmental protection order to the person who owns or who had possession, charge, or control of the spilled substance at the time it was spilled ordering that person to take any measures that the Minister or the environmental protection officer considers necessary to protect, restore or rehabilitate the natural environment, including any or all of the following measures

(a) to investigate the spill;

(b) to minimize or remedy the effects of the spill;

(c) to restore the area affected by the spill to a condition reasonably equivalent to the condition that existed immediately before the spill occurred;

(d) to measure the rate of release or the ambient concentration of the substance spilled;

(e) to install, repair or alter any equipment or thing designed to control or eliminate the release of the substance spilled;

(f) to monitor, measure, contain, remove, store, destroy or otherwise dispose of the substance spilled, or to lessen or prevent further spills of or

Obligation d'atténuer les effets

135. Quiconque est propriétaire, a possession, ou a la responsabilité ou le contrôle de la substance déversée en question au moment de son déversement est tenu:

a) de prendre toutes les mesures appropriées pour:

(i) limiter, réparer et corriger les conséquences du déversement,

(ii) récupérer la substance déversée de manière à supprimer ou à atténuer le danger pour la vie ou la santé humaine et l'environnement naturel;

b) de restaurer l'environnement naturel ou de le remettre dans un état comparable à celui dans lequel il était immédiatement avant le déversement.

Ordonnances de protection de l'environnement relatifs aux déversements

136. En cas de déversement, le ministre ou un agent de protection de l'environnement peut prendre une ordonnance de protection de l'environnement enjoignant à la personne qui est propriétaire, a possession ou a la responsabilité ou le contrôle de la substance déversée au moment de son déversement de prendre toutes les mesures qu'il juge nécessaires pour protéger et restaurer l'environnement naturel ou le remettre en état, notamment:

a) faire enquête sur le déversement;

b) limiter le plus possible ou corriger les conséquences du déversement;

c) remettre la zone touchée dans un état comparable à celui dans lequel elle était immédiatement avant le déversement;

d) mesurer le taux de rejet ou la concentration de la substance déversée dans le milieu ambiant;

e) installer, réparer ou modifier tout matériel ou dispositif destiné à contrôler ou à empêcher le rejet de la substance déversée;

f) surveiller, mesurer, contenir, enlever, entreposer, détruire ou, d'une quelque autre façon, éliminer la substance déversée, diminuer

control the rate of release of the substance spilled; and

(g) to report on any matter ordered to be done in accordance with directions set out in the order.

Failure to mitigate

137. Where any person fails to take the measures required under paragraph 135(a), and an environmental protection officer is of the opinion that danger to human life or health or to the natural environment is occurring or may occur, an environmental protection officer may take the measures, described under paragraph 135(a), cause them to be taken or direct any person referred to in section 135 to take them.

Inconsistency with another act

138. Any direction of an environmental protection officer under section 137 that is inconsistent with any other enactment is void to the extent of the inconsistency.

Right of access

139.(1) Where it is necessary to prevent serious imminent harm to a person or the natural environment, an environmental protection officer authorized or other person directed to take any measures under section 137 may subject to section 152 enter and have access to any place or property and may do such reasonable things as may be necessary in the circumstances.

(2) Subject to subsection (3) a person who provides assistance or advice in taking the measures required by sections 135, 136 or 137, is not personally liable in respect of anything done or omitted in good faith in the course of providing such assistance or advice.

(3) Subsection (2) does not exempt from liability a person described in subsection 133.

PART 12

REGULATIONS

Regulations concerning Parts 1, 2, 4, 5 and 15

140. The Commissioner in Executive Council may make regulations relating to Parts 1, 2, 4, 5 and 15 respecting any matter which the Commissioner in Executive Council considers necessary to carry the purposes and provisions of Parts 1, 2, 4, 5 and 15 into effect.

ou empêcher tout autre déversement ou contrôler le taux de rejet de la matière en question;

g) faire rapport de tout autre aspect visé par l'ordonnance.

Manquement à atténuer les conséquences

137. Si le destinataire de l'ordonnance prévue à l'article 135 ne prend pas les mesures exigées à l'alinéa 135 a), l'agent de protection de l'environnement peut les prendre lui-même, les faire prendre ou ordonner au destinataire de les prendre, s'il estime que l'omission compromet ou risque de compromettre la vie ou la santé humaine.

Incompatibilité avec une autre loi

138. Les directives données par l'agent de protection de l'environnement aux termes de l'article 137 sont nulles dans la mesure où elles sont incompatibles avec les dispositions d'un autre texte.

Droit d'accès

139.(1) L'agent de protection de l'environnement autorisé ou la personne visée à l'article 137 peuvent, sous réserve de l'article 152, avoir accès à tout lieu ou bien et prendre les mesures nécessaires pour empêcher qu'un grave préjudice ne soit causé à très brève échéance à une personne ou à l'environnement naturel.

(2) Sous réserve du paragraphe (3), n'encourt aucune responsabilité personnelle pour les actes ou omissions qu'elle commet de bonne foi à cette occasion, la personne qui fournit aide et conseils pour l'intervention visée aux articles 135, 136 ou 137.

(3) Le paragraphe (2) n'exonère pas de sa responsabilité la personne visée à l'article 133.

PARTIE 12

RÈGLEMENTS

Règlements visant les parties 1, 2, 4, 5 et 15

140. Le commissaire en conseil exécutif peut, par règlement, prendre les mesures qu'il juge nécessaires pour l'application des parties 1, 2, 4, 5 et 15.

pesticide application or the transportation of the pesticides; and

(ii) on facilities used to store hazardous substances or pesticides;

(k) respecting the application of pesticides on, over or near open bodies of water or land;

(l) respecting the cleaning of any equipment, apparatus, container, aircraft, watercraft, vehicle or machine used to hold, mix or apply a pesticide or in connection with a pesticide; and

(m) respecting any matter which the Commissioner in Executive Council considers necessary to carry the purposes and provisions of Part 10 into effect.

Regulations concerning Part 11

147. The Commissioner in Executive Council may make regulations relating to Part 11 including regulations

(a) prescribing the form and content of a report concerning a spill;

(b) classifying spills and exempting any spill or any class of spill from the application of Part 11 and attaching terms and conditions to any such exemption;

(c) respecting requirements for remedial action in response to a spill;

(d) respecting compensation to persons who suffer a loss due to a spill; and

(e) respecting any matter which the Commissioner in Executive Council considers necessary to carry the purposes and provisions of Part 11 into effect.

Regulations concerning Part 13

148. The Commissioner in Executive Council may make regulations relating to Part 13 including regulations

(a) prescribing the requirements and procedures for issuing environmental protection orders; and

(b) respecting any matter which the Commissioner in Executive Council considers

(i) les véhicules et le matériel servant à l'application ou au transport de pesticides,

(ii) les installations servant à l'entreposage de substances dangereuses ou de pesticides;

k) régir l'application de pesticides à la surface ou à proximité d'étendues d'eau ou de terrains;

l) réglementer le nettoyage de tout matériel, appareil, contenant, aéronef, navire, véhicule ou machine servant à garder, mélanger ou appliquer un pesticide ou utilisé avec un pesticide;

m) prendre toute autre mesure qu'il juge nécessaire à l'application de la partie 10.

Règlements visant la partie 11

147. Le commissaire en conseil exécutif peut, par règlement pris en application de la partie 11 :

a) arrêter le mode de présentation et la teneur des rapports de déversement;

b) classifier les déversements et exempter un déversement quelconque ou une classe de déversements quelconque de l'application de la partie 11 et déterminer les conditions assorties à de telles exemptions;

c) établir les exigences relatives aux mesures de réparation qu'entraîne un déversement;

d) réglementer l'indemnisation des personnes subissant des pertes à la suite d'un déversement;

e) prendre toute autre mesure qu'il juge nécessaire à l'application de la partie 11.

Règlements visant la partie 13

148. Le commissaire en conseil exécutif peut, par règlement pris en application de la partie 13 :

a) établir les exigences et modalités de prise d'ordonnances de protection de l'environnement;

b) prendre toute autre mesure qu'il juge nécessaire à l'application de la partie 13.

SPECIAL WASTE REGULATIONS

Yukon
Renewable Resources

Section C - November 10, 1995

SPECIAL WASTE REGULATIONS

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ENVIRONMENT ACT

SPECIAL WASTE REGULATIONS

I. INTERPRETATION AND APPLICATION

Definitions

1. In these Regulations,

"Act" means the *Environment Act*; «loi»

"biomedical waste" means biomedical waste as defined in section 2.2. of the *Guidelines for the Management of Biomedical Waste in Canada (CCME-EPC-WM-42E)* published by the Canadian Council of Ministers of the Environment in February 1992, except the definition shall be read without reference to the expression "a trained person has certified that"; «déchet biomédical»

"dangerous goods" means dangerous goods as defined in the *Dangerous Goods Transportation Act (Yukon)*, as amended from time to time; «marchandises dangereuses»

"Federal Regulation" means the *Transportation of Dangerous Goods Regulations* (Canada), SOR/85/11 of January 18, 1985, as amended from time to time; «règlement fédéral»

"generator" means any person who by virtue of ownership, operation, management or control causes or allows to cause, within a 30 day period, the creation, storage, transfer, or disposal of special waste that is

(a) a solid special waste, or a combination of

LOI SUR L'ENVIRONNEMENT

RÈGLEMENT SUR LES DÉCHETS SPÉCIAUX

I - INTERPRÉTATION ET APPLICATION

Définitions

1. Les définitions qui suivent s'appliquent au présent règlement : .

«déchet biomédical» Déchet biomédical tel que défini à l'article 2.2 des *Lignes directrices pour la gestion des déchets biomédicaux au Canada* (CCME-EPC-WM-42E) publiées par le Conseil canadien des ministres de l'environnement en février 1992, en faisant abstraction de l'expression «qu'une personne expérimentée ait certifié que»; "biomedical waste"

«déchets spéciaux» Comprend

(a) les marchandises dangereuses qui ne sont plus utilisées aux fins dont elles étaient destinées, comprenant des marchandises dangereuses :

(i) recyclées, traitées, éliminées,

(ii) destinées au recyclage, au traitement ou à l'élimination,

(iii) en entreposage ou en transit avant d'être recyclées, traitées ou éliminées;

(b) les déchets d'huile;

(c) les déchets biomédicaux;

more than one solid special wastes, in a quantity of 5 kilograms or more,

(b) a liquid special waste other than waste oil in a quantity of 5 litres or more,

(c) a mixture of a solid special waste and a liquid special waste other than waste oil in a quantity of 5 kilograms or 5 litres or more,

(d) waste oil in a quantity of 20 litres or more, or

(e) a special waste prescribed by the Commissioner in Executive Council; «producteur»

mais exclut une marchandise dangereuse

(d) retournée à un fabricant ou à un fournisseur de marchandises dangereuses, dans le but d'être recyclée, remballée ou revendue et comprend, entre autres, la marchandise dangereuse qui est :

(i) défectueuse ou inutilisable pour les fins auxquelles elle est destinée,

(ii) excédentaire mais toujours utilisable pour les fins auxquelles elle est destinée;

(e) qui est comprise dans les classes 1 ou 7 du règlement fédéral; "special waste"

"household" means a single dwelling, but does not include commercial or institutional land use or activities including, but not limited to,

(a) nursing homes,

(b) hotels and motels, and

(c) agricultural operations; «ménage»

«huile usées» Huile d'origine industrielle ou autre qui est inappropriée aux fins auxquelles elle était destinée à cause de la présence d'impuretés ou de la perte de propriétés originales et comprend, entre autres, de l'huile utilisée à titre de lubrifiant, de liquide hydraulique, de fluides pour l'usinage des métaux, de liquides qui isolent ou refroidissent, ainsi que tout autre liquide ou agent de refroidissement de même nature; "waste oil"

"special waste" includes

(a) dangerous goods that are no longer used for their original purpose, including a dangerous good that is

«établissement pour la gestion des déchets spéciaux» Établissement qui manutentionne ou élimine des déchets spéciaux produits par d'autres personnes ou exploitations et comprend, entre autres, un réseau communautaire d'enlèvement dans le but

(i) recycled, treated or disposed,

(ii) intended for recycle, treatment or disposal, or

(iii) in storage or transit before recycle, treatment or disposal,

(b) waste oil, or

(c) biomedical waste;

but does not include a dangerous good that is

(d) returned to a manufacturer or supplier of the dangerous good for reprocessing, repackaging or resale, including but not limited to a dangerous good that is

(i) defective or otherwise not usable for its original purpose, or

(ii) in surplus quantities but still usable for its original purpose, and

(e) included in class 1 or class 7 in the Federal Regulations; «déchets spéciaux»

"special waste management facility" means an operation which handles or disposes special wastes generated by other persons or operations, and includes without limitation a community collection system which is intended to collect or transport special waste to a special waste management facility in the Yukon; «établissement pour la gestion de déchets

d'enlever ou de transporter des déchets spéciaux à un établissement pour la gestion de ces déchets au Yukon; "special waste management facility"

«loi» S'entend de la *Loi sur l'environnement*; "Act"

«marchandises dangereuses» Marchandises dangereuses au sens de la *Loi sur le transport des marchandises dangereuses* (Yukon), ainsi que ses modifications; "dangerous goods"

«ménage» Une unité de logement, à l'exception d'activités ou de terres utilisées à des fins commerciales ou institutionnelles, y compris, entre autres :

a) les maisons de soins infirmiers;

b) hôtels et motels;

c) exploitations agricoles; "household"

«producteur» Toute personne, du fait qu'elle soit propriétaire, qu'elle exploite, qu'elle gère ou qu'elle contrôle, cause ou permet que soit causé, au cours d'un délai de 30 jours, la création, l'entreposage, le transfert ou l'élimination d'un déchet spécial qui est

a) solide, ou qui est un mélange de plus d'un déchet spécial solide, dont la quantité est de 5 kilogrammes ou plus;

b) sous forme liquide, à l'exception d'huiles usées, en quantité de 5 litres ou plus;

Yukon Waters Act is not subject to the regulations where the person's activities respecting special waste are carried out exclusively on the lands expressly referred to in the permit, lease, licence, or other disposition or approval.

II. PROHIBITIONS

Prohibitions against release

3.(1) Subject to section 6, no person shall release or cause to be released into the environment any special waste which

(a) causes or may cause an adverse effect, or

(b) is equal to or greater than

(i) within a 24 hour period,

(A) 500 grams in the case of a solid waste,

(B) 500 milliliters in the case of a liquid waste, or

(C) 500 grams or 500 milliliters, whichever is less, in the case of a mixture of a solid waste and a liquid waste, or

(ii) within a 30 day period,

(A) 5 kilograms in the case of a solid waste,

Yukon, de la *Loi sur les terres territoriales* ainsi que de la *Loi sur les eaux du Yukon* n'est pas assujettie au règlement lorsque les activités de cette personne concernant les déchets spéciaux sont exercées exclusivement sur les terres dont il est fait mention au permis, au bail, à la licence ou sur toute autre autorisation.

II. INTERDICTIONS

Interdiction de rejeter

3.(1) Sous réserve de l'article 6 et à moins que le rejet ne soit autorisé par la loi et le présent règlement, ou qu'un permis soit émis en vertu de ces actes juridiques, nul ne doit rejeter ou faire en sorte que soit rejeté dans l'environnement des déchets spéciaux qui

a) entraînent ou pourraient entraîner des conséquences préjudiciables;

b) atteignent ou excèdent,

(i) au cours d'une période de 24 heures, 500 grammes pour un rejet solide, 500 millilitres pour un déchet liquide ou le moindre de 500 grammes ou de 500 millilitres pour un composé de solides et de liquides;

(ii) au cours d'une période de 30 jours, 5 kilogrammes pour un déchet solide, 500 millilitres pour un déchet liquide ou le moindre de 5 kilogrammes ou de 5 litres pour un mélange de solides et de liquides.

spéciaux» and

"waste oil" means oil from industrial or non-industrial sources that has become unsuitable for its intended purpose due to the presence of impurities or the loss of original properties and includes but is not limited to oil used as lubrication oil, hydraulic fluid, metal working fluid, insulating fluid or coolant, and other associated fluids or coolants; «huiles usées»

c) un mélange de liquides et de solides, à l'exception d'huiles usées, en quantité de 5 kilogrammes ou 5 litres ou plus;

d) un déchet d'huile en quantité de 20 litres ou plus;

e) prescrit par le Commissaire en conseil exécutif; "generator"

«règlement fédéral» S'entend du *Règlement sur le transport des marchandises dangereuses* (Canada) DORS/85-77 du 18 janvier 1985, ainsi que ses modifications. "Federal Regulation"

Application

2.(1) For the purposes of handling, offering for transport or transporting special waste,

(a) special waste shall be subject to the requirements for waste dangerous goods pursuant to the *Dangerous Goods Transportation Act* and the Federal Regulations, and

(b) special wastes which are listed on Schedule 2 shall be subject to the requirements applicable to waste dangerous goods using the shipping name, classification and product identification number, if any, as specified in Schedule 2.

Application

2.(1) Aux fins de la manutention, du transport ou d'une offre de transport

a) les déchets spéciaux sont assujettis aux exigences des déchets de marchandises dangereuses, conformément à la *Loi sur le transport des marchandises dangereuses* et du règlement fédéral;

b) les déchets spéciaux énumérés à l'Annexe 2 sont assujettis aux exigences applicables aux déchets de marchandises dangereuses utilisant un nom d'expédition, une classification et un numéro d'identification du produit, s'il existe, tel qu'indiqué à l'Annexe 2.

(2) A person who holds a permit, lease, licence or other disposition or approval pursuant to the *Yukon Placer Mining Act*, the *Yukon Quartz Mining Act*, the *Territorial Lands Act*, and the

(2) Une personne qui détient un permis, un bail, une licence ou toute autre autorisation en vertu de la *Loi sur l'extraction de l'or dans le Yukon*, de la *Loi sur l'extraction du quartz dans le*

(B) 5 litres in the case of a liquid waste, or

(C) 5 kilograms or 5 litres, whichever is less, in the case of a mixutre of a solid waste and a liquid waste,

except where the release is authorized by the *Act* or these regulations or a special waste permit issued under the Act or these regulations.

(2) A release under subsection (1) includes, without limitation,

(a) storage or disposal of special waste by means of underground injection, and

(b) deposit or discharge of special waste into a waste disposal system operated by a municipality, any other public authority, or a commercial operator.

(3) Notwithstanding subsections (1) and (2), an environmental protection officer may authorize a release of special waste where the officer forms the opinion that the release may prevent or is necessary to mitigate against another release which may create a more significant adverse effect on the environment.

Prohibition against transporting special waste

4. No person shall handle, offer for transport

(2) Un rejet en vertu du paragraphe (1) comprend, entre autres :

a) l'entreposage ou l'élimination de déchets spéciaux au moyen d'injections souterraines;

b) le dépôt ou le déversement de déchets spéciaux dans un système d'élimination de déchets exploité par une municipalité ou toute autre administration publique ou exploitant commercial.

(3) Par dérogation aux paragraphes (1) et (2), un agent de protection de l'environnement peut autoriser le rejet de déchets spéciaux lorsqu'il est d'avis que ce rejet peut prévenir ou est nécessaire afin de réduire les conséquences préjudiciables plus grandes sur l'environnement que pourrait causer un autre rejet.

Interdiction de transporter les déchets spéciaux

4. Nul ne doit manutentionner, offrir de

(e) method of treatment or disposal.

e) le mode de traitement ou d'élimination.

Fees

10.(1) A person applying for a special waste permit shall submit the fee specified in Schedule 1 to the Minister with the application for the permit.

(2) A fee is not refundable on account of the Minister not issuing a special waste permit.

(3) The Minister may waive fees when he or she considers it appropriate in the circumstances.

Droits

10.(1) Une personne qui soumet une demande pour un permis de déchets spéciaux doit y joindre les droits, payables au ministre, tel qu'il apparaît à l'Annexe 1.

(2) Les droits ne sont pas remboursables mêmes si le ministre refuse d'émettre un permis de déchets spéciaux.

(3) Le ministre peut renoncer à imposer des droits s'il trouve la situation appropriée étant donné les circonstances.

IV. TRANSFER OF SPECIAL WASTE

Transportation Certificate

11.(1) Unless otherwise authorized by these regulations, no person shall transport special waste without a certificate issued under the *Motor Transport Act.*

(2) Subsection (1) does not apply to a generator who transports special waste generated from its own operation to a permitted special waste management facility, or an authorized carrier, but the generator is subject to any other requirement in the *Act* and these regulations.

IV. TRANSFERT DES DÉCHETS SPÉCIAUX

Certificat de transport

11.(1) À moins d'être autorisé par le présent règlement, nul ne doit transporter des déchets spéciaux sans un certificat émis en vertu de la *Loi sur les transport routiers.*

(2) Le paragraphe (1) ne s'applique pas à un producteur qui transporte des déchets spéciaux, produit par sa propre exploitation, à un établissement agréé de gestion des déchets spéciaux, mais il est soumis à toute autre exigence de la loi et du présent règlement.

Transfer of special waste to special waste facility

12.(1) No person shall transfer special waste other than to

(a) a permitted special waste management facility in the Yukon,

(b) a carrier who is authorized under the *Motor Transport Act* or the *Motor Vehicle Transport Act* (Canada) to transport special waste, or

(c) a destination specified in a permit issued under section 8(1).

(2) A transfer which does not contravene the prohibition of subsection (1), and which otherwise complies with all other applicable requirements of these regulations, is deemed not to be a release.

Sale or transfer of waste oil

13.(1) Any person who

(a) purchases, or

(b) otherwise receives or obtains waste oil,

and who

(c) discovers that the quality or character of the waste oil at the time of the sale or transfer does not comply

Transfert de déchets spéciaux à un établissement pour déchets spéciaux

12.(1) Nul ne doit transférer des déchets spéciaux, à moins que ce soit :

a) à un établissement agréé pour la gestion de déchets spéciaux au Yukon;

b) à un transporteur autorisé en vertu de la *Loi sur les transports routiers* ou de la *Loi sur le transport par véhicule à moteur* (Canada) à transporter des déchets spéciaux;

c) à un endroit mentionné sur un permis émis en vertu du paragraphe 8(1).

(2) Un transfert est réputé ne pas être un rejet si ce transfert ne va pas à l'encontre du paragraphe (1) et respecte toutes les exigences du présent règlement.

Vente ou transfert d'huiles usées

13.(1) Une personne doit aviser le plus tôt possible le ministre ou un agent de protection de l'environnement lorsqu'elle :

a) soit achète,

b) soit reçoit ou obtient des huiles usées et

c) constate que les caractéristiques des huiles usées, au moment de la vente ou du transfert, ne se conformaient pas à la

with the *Act*, these regulations or a special waste permit

shall immediately notify the Minister or an environmental protection officer.

(2) No person shall sell or transfer waste oil in a manner which contravenes these regulations or a special waste permit.

loi, au présent règlement ou au permis sur les déchets spéciaux.

(2) Nul ne doit vendre ou transférer des huiles usées de sorte à contrevenir au présent règlement ou au permis pour déchets spéciaux.

V. OTHER

Notice and mitigation of release of special waste

14.(1) A person in possession or control of a special waste at the time of a release or who causes a release shall report the release, as soon as possible under the circumstances, to the Yukon Spills Report Centre and shall make a reasonable effort to notify the owner or person in charge of the released special waste and any members of the public who may be adversely affected by the release.

(2) For the purpose of subsection (1), a "release" means a release of special waste

(a) into the natural environment,

(b) from or out of a structure, vehicle or other container, and

(c) that is abnormal in quantity or quality in light of all the circumstances of the release, or

(d) in excess of a quantity described in section 3(1)(b).

V. AUTRES

Avis et atténuation du rejet de déchets spéciaux

14.(1) Une personne qui a la possession ou le contrôle de déchets spéciaux au moment de leur rejet ou qui est la cause d'un rejet doit aviser, dès que possible, le *Yukon Spills Centre* et déployer tous les efforts raisonnables afin d'aviser le propriétaire ou la personne responsable du rejet des déchets spéciaux ainsi que tout particulier qui pourrait être lésé par le rejet.

(2) Aux fins du paragraphe (1), «rejet» s'entend du rejet de déchets spéciaux :

a) dans l'environnement naturel,

b) à partir d'une structure, d'un véhicule ou d'un conteneur,

c) qui est inhabituel en qualité ainsi qu'en quantité, étant donné les circonstances,

d) qui excède la quantité prescrite à l'alinéa 3(1)b).

(3) Where a release of special waste occurs, the person who owns or has possession, charge, care or control of the released special waste shall, when he or she has knowledge of the release,

(a) take all reasonable measures

(i) to confine, repair, and remedy the effects of the release; and

(ii) to remove the substance released in such a manner as to reduce or mitigate any danger to human life, health and the natural environment; and

(b) restore or rehabilitate the natural environment to a condition reasonably equivalent to a condition that existed immediately before the release occurred.

(3) Le propriétaire ou la personne ayant la possession, la garde, la responsabilité ou le contrôle de déchets spéciaux, lors de leur rejet, doit, lorsqu'il a connaissance du rejet,

a) prendre toutes les précautions raisonnables afin de limiter, réparer et remédier aux conséquences du rejet et d'enlever la substance rejetée afin de réduire ou atténuer les dangers à la vie humaine, à la santé ainsi qu'à l'environnement naturel;

b) rétablir l'environnement naturel à un état acceptable équivalent à l'état qui prévalait avant le rejet.

Testing of waste oil

15. The Minister may

(a) obtain a sample of any waste oil and conduct analyses and tests of the waste oil, and

(b) require any person who has charge, care or control of waste oil to provide a sample and conduct analyses and tests of the waste oil

to determine if it conforms with the *Act*, these regulations or a special waste permit.

Analyse des huiles usées

15.(1) Afin de voir à l'application de la loi, du présent règlement ou d'un permis pour les déchets spéciaux, le ministre peut :

a) obtenir un échantillon d'huiles usées et procéder à des analyses de ces huiles;

b) exiger de toute personne qui a la garde, la responsabilité ou le contrôle d'huiles usées de fournir un échantillon afin qu'il puisse procéder à des analyses ainsi qu'à des essais.

SECTION D

SUPPLIERS AND RESOURCES

Response to transportation accidents are the responsibility of the shipper. Mine site personnel will lend whatever assistance is required in order to rapidly contain and clean up the spill.

Spills at the Mine site involving products received from the supplier are B.Y.G.'s responsibility. It is anticipated that the procedures outlined in this manual will be sufficient in most instances to deal with the problems that may arise. However, in some instances there may be a need to obtain further assistance. There are a number of resources able to assist with technical advise, provision of response personnel and equipment in the event of a spill. These are listed below in the unlikely event that assistance beyond the resources of B.Y.G. Natural Resources Inc. be required:

D.1 Dupont Canada Ltd. Emergency Response Services

Dupont provides technical advice and, if warranted, may dispatch a response team with specialized equipment to the site of the spill.

Dupont 24 Hour Emergency Number: (613) 348-3616

D.2 Cominco Metals

Cominco Metals provides 24 hour emergency response with specialized equipment to the site of any spill involving any of their products.

Cominco 24 Hour Emergency Number: (604) 364-4214

D.3 Canadian Transport Emergency Centre (CANUTEC)

CANUTEC provides information and communications assistance for transportation emergencies involving dangerous goods. CANUTEC has information on over 25,000 products and can be contacted for advice in case of emergencies.

CANUTEC 24 Hour Emergency Number: (613) 996-6666

D.4 A.A. Anderson Chemical Waste Disposal

A.A. Anderson is a private company providing response, cleanup and disposal services on a contract basis.

A.A. Anderson 24 Hour Number: (604) 277-1628

D.5 SUPPLIERS AND DEALERS

PRODUCT	VENDOR	PHONE NUMBER	CARRIER	PHONE NUMBER
Diesel Fuel				
Gasoline				
Lubricants				
Propane				
Methanol				
Explosives				
Ammonium Nitrate				
Lime				
Percol E10				
Sulfur Dioxide				
Sodium Cyanide				
Aerodri 104				
Antifreeze				
Anhydrous Borax				
Caustic Soda				
Hydrochloric Acid				
Sodium Nitrate				
Lab. Chemicals				
Copper Sulfate				

SECTION E

SUMMARY OF TELEPHONE NUMBERS

E.1 MINE SITE SPILL RESPONSE PERSONNEL

	NAME	OFFICE	HOME
Manager			
On-Scene Coordinator (OSC)			
Response Team Leader			
Safety Supervisor			
Fire Chief			
Mill Superintendent			
		Out of Town	
Environmental Coordinator			
Mine Superintendent			
Lab Supervisor			
Mill Office			
Control Room			
Project Metallurgist	G.C.Dickson	604 469 1524	
Vice-President, C.O.O.	J.B.Smith	604 469 1524	
President & C.E.O.	J.M.Slack	519 833 5927	

E.2 GOVERNMENT AGENCIES

Territorial Emergency Program (24 Hour Emergency Number)	1 403 667 7244
Environment Emergency Coordinator	
	Mobile
Environmental Protection Branch	
	Fax
Inspector of Mines (Prince George)	
Ministry of Health	
Ministry of Health	
Fish & Wildlife Branch	
RCMP	
Environment Canada	
Environment Canada Emergency - 24 Hr.	

E.3 SPILL RESPONSE ADVICE

Degussa Canada (Peroxide)SANIVAN.....1-800-361-8920 .....

CANUTEC (Transport Canada) .....(613) 996-6666 .....

Dupont (Cyanide)..... .....

Cominco (SO_2) ....

Ireco (Ammonium Nitrate).....(604) 292-8313 or 492-6156 or (403) 242-1824

Continental Lime (Lime)..... .....(604) 457-6291

Chevron (Fuel Oil) ....

Van Waters & Rogers (Methanol) .....SANIVAN 1-800-361-8920

Chentrec (Methanol) 1-800-424-9300

ICG (Liquid Propane)..... .....

.....

E.4 SPILL RESPONSE PERSONNEL

B.C.P.A. Oil Spill Co-op..... ....

....

E.5 COMMERCIAL CLEAN UP SERVICES

....)

E.6 SPILL CLEAN UP EQUIPMENT

Versatech Products Inc. (North Vancouver) 922-5357

E.7 OTHER

Poison Control Centre..... .....

Forest Fire Reports..... 911

Emergency Calls - ....)

SECTION F

ASSESSMENT OF SPILL POTENTIAL

Modern methods of packaging, transport and handling of potentially dangerous substances and an emphasis on proper training make serious spills unlikely.

Nevertheless, the severity of a potential spill is decreased by having a contingency plan in place and a demonstrated state of readiness.

F.1 TRANSPORTATION SPILLS

The area of greatest vulnerability for spills are transport related accidents resulting from events such as icy roads, washouts, landslides, snow slides, collisions, or mechanical failures. Contingency plans filed by the Shipper with Transport Canada and required to be in the possession of the driver should be capable of addressing most transportation-related accidents.

Because prompt action may be vital in effective containment of a spill, B.Y.G. Natural Resources Inc. would provide assistance to the transporter in the event of a spill, without assuming any liability. B.Y.G. Natural Resources Inc. makes every effort to ensure that reagent shipment are scheduled to avoid poor road conditions and that portions of the access road for which it is responsible are properly graded, plowed and otherwise maintained to minimize risk.

F.2 PLANT SITE SPILLS

A positive feature of the plant site with respect to spills will be that plant site drainage will be designed to move downhill towards a collection system. Spilled materials would be reclaimed and the affected areas detoxified accordingly.

F.3 FUELS

Fuel unloading is another potential area of vulnerability. Standard procedures are in effect for the safe unloading of fuels to storage tanks and safety berms are provided to contain spills at the tanks. In the event of any spill, affected soils would be disposed of in an approved manner.

F.4 CYANIDE (SOLID FORM)

Shipping, storage and handling of cyanide using Dupont Flo-bins or Degussa Bag and Crate containers will reduce the potential for spills of straight sodium cyanide. These are robust containers which will withstand considerable mishandling and mechanical abuse without puncture. Clean up of sodium cyanide briquettes would be handled by first recovering as much dry material as possible, followed by excavation of surrounding soils. Contaminated material would be returned to grinding and followed by conventional effluent treatment. Areas affected by a spill of dry sodium cyanide could be further treated with bleach if required.

F.5 LIME

Unloading of granular quicklime from bulk tank trucks can result in spillage but cleanup will be straightforward. Spills of quicklime around the plant site would be cleaned up with a front end loader and disposed of by recycling material to the crusher.

A lime slaker used to slake quicklime will be located external to the mill building but is physically connected to it via doorways.

F.6 EXPLOSIVES

The explosive used at the Mount Nansen Mine will be typical underground explosives and will be handled and store in the approved manner.

Detonators, detonating delays, prima cord and stick powder will be stored in two separate licensed explosive magazines.

F.7 SPILLS - INTERNAL OR EXTERNAL TO THE MILL

Occasional spills of effluents containing cyanide and other reagents within the mill are anticipated and will be handled by internal sumps. Any other situations will be addressed using a front end loader and portable sump. A temporary catchment sump can be developed quickly, followed by installation of a portable submersible pump which would return spillage to the closest possible point in the circuit.

F.8 SULFUR DIOXIDE (SO_2)

All sulfur dioxide lines and fittings are back-welded and pressure tested to prevent leaks.

Transfer of sulfur dioxide into the storage tank is accomplished by padding the tanker truck with recirculated fume from the storage tank to force the liquid into the storage tank. There will be no release of fume to atmosphere.

Small liquid leaks will be detected quickly by smell or application of ammonia gas in the vicinity which will produce a white cloud.

Large leaks must be approached using self-contained breathing apparatus and isolated by closing appropriate valving.

Sulfur dioxide is very heavy (2-1/4 times heavier than air) and will seek low areas.

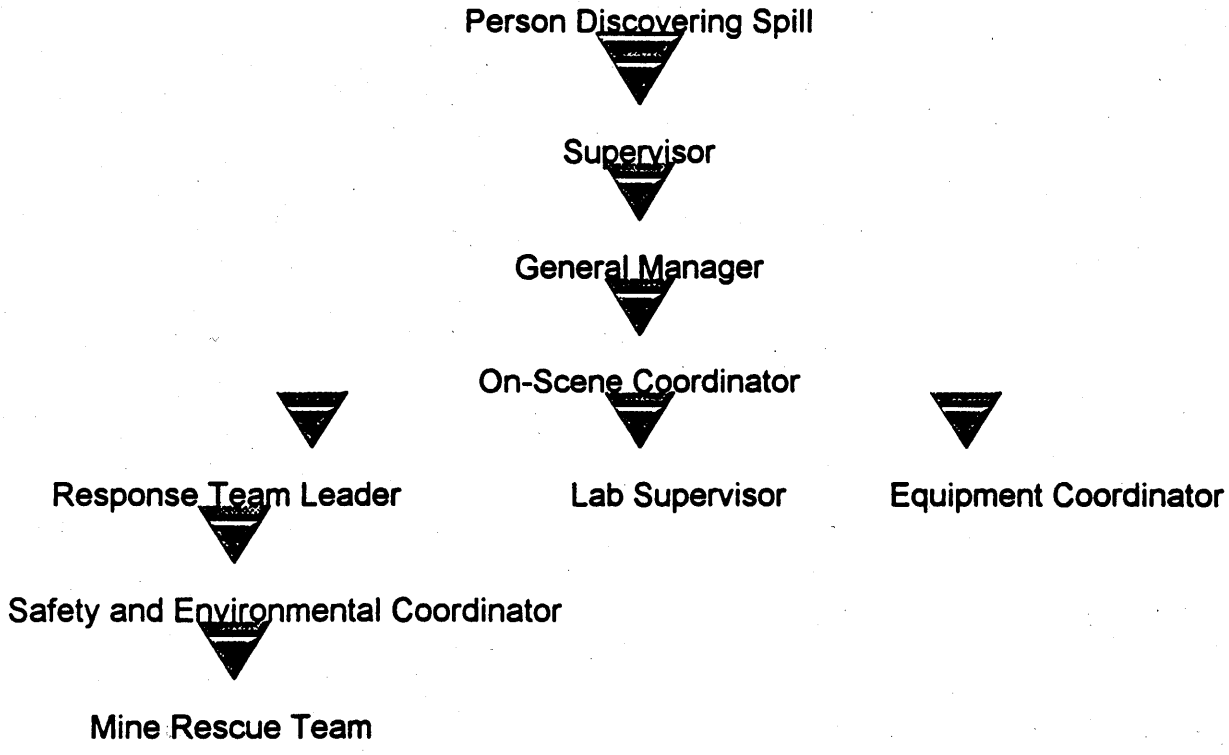
F.10 OTHER CONSUMABLES

There will other consumables which will be addressed as quantities and suppliers are finalized.

SECTION G

SPILL RESPONSE

G.1 RESPONSIBILITY CHART



G.2 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

SECTION H

EMERGENCY EVACUATION PROCEDURES

The most important aspect of an emergency situation requires:

a. The removal of personnel from the affected area in an orderly and expedient manner.

b. Notification of rescue/emergency personnel and management.

c. Protection and containment of area.

H.1 MINE

The person reporting must notify the supervisor as well as other employees in the area. The supervisor will notify management and safeguard the area and employees. Rapid assessment and decisions may be made by the supervisor who will take initial control of the situation. He will be responsible to tally his employees at a pre-determined location such as the mine dry.

H.2 SHOP/WAREHOUSE

The maintenance foreman will take immediate action to control and protect the area and notify his and warehouse employees of hazards. He will request aid if necessary, and tally his personnel at a pre-determined location.

H.3 MILL/LAB

The Mill supervisor will take immediate action to control and protect the area and notify his and lab employees of hazards. He will notify the Mine supervisor, request aid if necessary, and tally his employees at a pre-determined location such as the mill dry/administration area.

H.4 GENERAL

First aid, mine rescue, equipment and machine operators must be notified as soon as possible to start rescue/protection efforts. Action Steps should be followed and proper procedures maintained. The two-way radio will be a most important tool in notification and response proceedings. The airway channel MUST REMAIN OPEN for emergency use.

SECTION I

SENSITIVE AREAS AND RESOURCES

I.1 WATERCOURSES

The Mount Nansen Mine property is drained on the north, east, south and west sides by Pony Creek, Back Creek, Dome Creek, Discovery Creek, Dolly Creek, Webber Creek, Cabin Creek and South Fork. All these creeks drain into either Nansen Creek, running North-South on the West of the property, or Victoria Creek running North-South on the East of the property. However the only creeks impacted by the proposed mine are Pony Creek, Back Creek and Dome Creek. These creeks drain into Victoria Creek which flows into Nansen Creek then into the Nordenskiold River which joins the Yukon River just north of Carmacks. (see location map and site plan).

Site access is via the Mt. Nansen Road which leaves the Mt. Freegold Road just north of Carmacks.. There are two significant stream crossings on this road beside the initial crossing of the Nordenskiold River at Carmacks. One crossing is by bailey bridge at 32 km along the road at the crossing of Rowlinson Creek. The other is the crossing of Victoria Creek at 6 km from the mine site. The crossing at Victoria Creek, a ford at the moment, will be upgraded to a causeway with culverting. There are several small drainage ditches that cross the road where there may be some concern in regard to spills.

SECTION J

OIL SPILL RECOVERY TECHNIQUES FOR STREAMS

Because of the location of, and protection provided by the oil storage facilities at the mine site, an oil spill reaching a watercourse is extremely unlikely from this source. Measures such as dyking and absorption of minor spills with sand, soils, or commercial sorbents are considered to be the most likely responses to such incidents.

The main type of incident which must be planned for is an oil transport incident at or near a watercourse. Spill contingency plan developed by the transporter and/or fuel supplier will be the first line of defense for this event.

Some techniques commonly practiced to contain oil spills are listed below. Additional information on spill containment procedures are included in Section 1.

J.1 EARTH DAM

A dam made of earth or other available fill can be quickly constructed to contain and prevent a spill from spreading. If the ground is permeable, it may be necessary to excavate a shallow depression and line it with plastic to prevent the oil from seeping away. Where the spill is being contained in a channel containing flowing water, a section of pipe can be buried beneath the berm created, allowing water to escape while retaining floating oil behind the berm. Floating oil can then be absorbed by straw or commercial absorbents.

J.2 PLANK OR LOG DAM

A barrier may be constructed across a small flowing stream or ditch using a wooden plank or log embedded in opposite banks. With this arrangement, water can flow beneath and floating oil collected behind the plank. Floating oil could then be absorbed.

J.3 NET OR WIRE MESH BARRIER

A technique which lends itself to the collection of thin films of oil on fast flowing water is a net or wire mesh barrier. This consists of netting or wire mesh held in place by stakes, behind which sorbent materials are allowed to float.

SECTION K

PRACTICE DRILLS AND TRAINING

It is the responsibility of the OSC and RTL to organize and coordinate training sessions and practice drills as part of the overall Spill Contingency planning. The objectives are:

a. To train all personnel in spill response procedures.

b. To ensure proper functioning of containment and cleanup equipment.

c. To identify problems with the planned procedures.

A variety of techniques and resources can be used for training and practice drills. Emphasis has been given to the handling of substances deemed to pose the most significant hazards, namely:

a. Sodium cyanide

b. Fuels

c. Hydrogen peroxide

d. Sulfur dioxide

In addition, training in the use of specialized equipment such as self-contained breathing apparatus and gas monitoring equipment has occurred with key personnel.

SECTION L

NOTIFICATION PROCEDURE FOR DOWNSTREAM WATER USERS

Upon notifying the Department of the Environment, the responsibility of alerting downstream water users and residents is given to the Water Management Branch and Environmental Protection of the Ministry of Environment, Lands and Parks.

Contact

Ministry of Environment, Lands and Parks
1 403 667 7244

SECTION M

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM

1. Right to know more about health and safety hazards in the workplace.

2. Federal & Provincial legislation became effective October 31, 1988:

3. Developed over several years with collective efforts by labor, industry and government regulatory agencies (Canada wide).

4. What is a hazardous material? .... a substance or mixture that meets or exceeds stated criteria:

Class A	Compressed gas
Class B	Flammable or combustible
Class C	Oxidizing agent
Class D	Poisonous or infectious
Class E	Corrosive
Class F	Reactive

M.1 SUPPLIER LABEL

a) Anyone who sells, advertises or imports a controlled product: distributor, packager, custom processor.

b) Provide following information:

1. Material and supplier
2. Hazard symbol
3. Risk
4. Precautions to be taken
5. First aid measures
6. Advising MSDS (Material Safety Data Sheet) is available.

c) Supplier label must be in place when delivered to site. (some transport of dangerous goods placards also.)

M.2 WORK SITE LABEL

a) Employer responsible.

b) Ensure employees know and understand all about product.

c) Transfers to other containers require workplace label unless used immediately.

d) Piping systems must be identified. Tanks also.

M.3 M.S.D.S. (MATERIAL SAFETY DATA SHEET)

a) Developed by supplier (in both English and French)

b) Identification of product.

c) Physical data.

d) Fire and explosion data.

e) Reactivity data.

f) Prevention and first aid measures.

g) Names and phone numbers of persons to be contacted for additional information.

h) Date of preparation (valid for three years only).

i) M.S.D.S. - must be made available at every workplace where employees may come in contact with any controlled materials.

M.4 WORKER EDUCATION

a) Every worker who may come in contact with;

b) Employee must understand (persons unable to read English or French must be taught);

c) Employees must be updated every year.

M.5 WHMIS HAZARD SYMBOLS, CLASSES AND DIVISION

SECTION N

EMERGENCY OPERATIONS AND RESPONSE

N.1 EMERGENCY RESPONSE CENTRE

The Mine Manager will be act as the Emergency Response Coordinator. The Mine Manager's direct line (403-863-5913 until different line is installed) will be used for communications in the event of an emergency. This line will be kept clear for priority use. The Environmental Coordinator (***-***-****) will provide back-up emergency response in the event that the Mine Manager is unable to respond quickly to the emergency.

N.2 PUBLIC AFFAIRS AND MEDIA

All releases of information to the public regarding spills and other emergencies will be approved by the Mine Manager. This Spill Contingency Plan will be available to the Public and the Media for review and comment. B.Y.G. will incorporate appropriate suggestions for improvements to the plan when updates are prepared.

Radio and Television Stations List:

N.3 FIRST AID ATTENDANTS

(to be completed as available)

N.4 MINE RESCUE PERSONNEL

(to be completed as available)

SECTION O

EQUIPMENT

(to be update as equipment is assembled)

SECTION 1

Latest Revision - November 10, 1995

DIESEL FUEL

1.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

1.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

1.3 INITIAL SPILL RESPONSE

a) Stop the flow if possible.

b) Eliminate open flame ignition sources.

c) Contain flow of oil by dyking, barricading or blocking flow by any means available. Use earth-moving equipment if available.

d) Prevent spill from reaching flowing water.

1.4 HAZARDS

a) Slightly toxic by ingestion; highly toxic if aspirated.

b) Flammable.

1.5 ACTION FOR FIRE

a) Use CO_2, dry chemical, foam or water spray (fog), although water may spread the fire.

b) Use fog streams to protect rescue team and trapped people.

c) Use water to cool surface of tanks.

d) Divert the diesel fuel to an open area and let it burn off under control.

e) If the fire is put out before all diesel fuel is consumed, beware of re-ignition.

f) Rubber tires are almost impossible to extinguish after involvement with a fire. Have vehicles with burning tires removed from the danger area.

g) Contact with strong oxidizing agents (i.e. hydrogen peroxide, ammonium nitrate) may ignite the product, or cause it to explode.

1.6 RECOVERY*

a) Unburned diesel fuel can be soaked up by sand, straw, peat moss, or by commercial sorbents such as Graboil.

b) If necessary, contaminated soil should be excavated.

c) Diesel fuel entering the ground can be recovered by digging sumps or trenches and pumping from below the water table.

d) Diesel fuel on a water surface should be collected and recovered by booms, sorbents such as Graboil, or collected by a liquid/solid vacuum cleaner.

* See special section on Oil Recovery on following pages.

1.7 DISPOSAL

a) Incineration under controlled conditions. Obtain permission from Environmental Protection.

b) Burial at an approved site.

1.8 PROPERTIES

a) Chemical composition - mixture of hydrocarbons in the range C_9 to C_{18}.

b) Clear, oily liquid.

c) Not soluble, floats on water.

1.9 ENVIRONMENTAL THREAT

a) Moderately toxic to fish and other aquatic organisms.

b) Harmful to waterfowl.

c) May create unsightly film on water.

1.10 CONTAINERS

To be determined.

1.11 SUPPLIER

See Section D

MATERIAL SAFETY DATA SHEET

CHEVRON

MATERIAL: CHEVRON DIESEL FUEL NO.2 MSDS NUMBER: 525
CHEVRON PRODUCT SYSTEM ID: CPS 272102

CHEVRON CANADA LIMITED
1500-1050 WEST PENDER STREET
VANCOUVER, B.C. V6E 3T4
PHONE: 604-668-5300

MATERIAL USE: MOTOR FUEL

HAZARDOUS INGREDIENTS

CONTROLLED PRODUCTS	CONCENTRATION	ID CAS, UN/NA	EXPOSURE LIMITS	LD50 LC50 (species/route)
Not Applicable				

WHMIS CLASSIFICATION : Class B3,D2B

TDG CLASSIFICATION : Fuel Oil, Class 3.3, UN 1202, Pkg. Grp. III

TOXICOLOGICAL PROPERTIES OF PRODUCTS - SUMMARY

LD50 (Species & Route) Not Available	Irritancy Skin Irritant	Exposure Limits Not Applicable
LC50 Not Available	Sensitization Not Applicable	Synergistic Materials Not Applicable

__Carcinogenicity __Reproductive Effect
__Teratogenicity __Mutagenicity

Prepared by: CHEVRON ENVIRONMENTAL HEALTH CENTRE, INC.
P.O. BOX 4054, RICHMOND, CA 94804-0054
EMERGENCY PHONE: (800) 457-2022

Revision/Date: Rev. 9, 09/02/89

Emergency Phone Number(800) 457-2022

Material Safety Data Sheet CHEVRON
Material Safety Data Sheet CHEVRON
Material Safety Data Sheet CHEVRON
Material Safety Data Sheet CHEVRON

CHEVRON Diesel Fuel No. 2

CPS272102

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

The Chevron MSDSs have been reformatted and expanded to provide you with useful hazard warnings and health evaluations and to facilitate your compliance with local, State and Federal regulations.

1. PRODUCT IDENTIFICATION

CHEVRON Diesel Fuel No. 2

DANGER! - HARMFUL OR FATAL IF SWALLOWED
- PROLONGED OR REPEATED SKIN CONTACT CAN BE HARMFUL
- MAY CAUSE SKIN IRRITATION
- COMBUSTIBLE
- KEEP OUT OF REACH OF CHILDREN

CHEVRON PRODUCT NUMBER(S): CPS272102
PRODUCT INFORMATION: (800)582-3835

Revision Number: 9 Revision Date: 09/02/89 MSDS Number: 000525
NDA - No Data Available NA - Not Applicable

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID

EYE CONTACT:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN CONTACT:
Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.
INHALATION:
If any signs or symptoms as described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital. Note to Physician: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:
This substance is not expected to cause prolonged or significant eye irritation.
SKIN IRRITATION:
This substance is a moderate skin irritant so contact with the skin could cause prolonged (days) injury to the affected area. The degree of injury will depend on the amount of material that gets on the skin and the speed and thoroughness of the first aid treatment. Signs and symptoms may include pain or a feeling of heat, discoloration, swelling, and blistering. Read the Additional Health Data section (12) of this document for more information.
DERMAL TOXICITY:
If absorbed through the skin, this substance is considered practically non-toxic to internal organs.
RESPIRATORY/INHALATION:
Prolonged breathing of vapors can cause central nervous system effects. This hazard evaluation is based on data from similar materials. Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination.
INGESTION:
If swallowed, this substance is considered practically non-toxic to internal organs. Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the

substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves.
RESPIRATORY PROTECTION:
This material may be an inhalation hazard and, unless ventilation is adequate, the use of approved respiratory protection is recommended.
VENTILATION:
Use this material only in well ventilated areas.

5. FIRE PROTECTION

FLASH POINT: (P-M) 125F (52C) Min.
AUTOIGNITION: NDA
FLAMMABILITY: NDA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam and Water Fog.
NFPA RATINGS: Health 1; Flammability 2; Reactivity 0; Special NDA;
HMIS RATINGS: Health 2; Flammability 2; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire document and label before using this product.
FIRE FIGHTING PROCEDURES:
Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85 F.

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire document.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
NDA.
STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid. CAUTION! Do not use pressure to empty drum or explosion may result. WARNING! Not for use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
APPEARANCE: Pale yellow liquid.
BOILING POINT: 176 - 370C (348-698F)
MELTING POINT: NA
EVAPORATION: NDA
SPECIFIC GRAVITY: 0.84 @ 15.6/15.6C (Typical)
VAPOR PRESSURE: 0.04PSIA @ 40C
PERCENT VOLATILE (VOLUME %): NDA
VAPOR DENSITY (AIR=1): NDA
VISCOSITY: 1.9 cSt @ 40C (Min.)

8. SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
This material is not expected to present any environmental problems other than those associated with oil spills.

Eliminate all open flame in vicinity of spill or released vapor. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Protective Equipment. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil.

Revision Number: 9 Revision Date: 09/02/89 MSDS Number: 000525
NDA - No Data Available NA - Not Applicable

Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local, environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS# COMPONENT/REGULATORY LIMITS

100.0 % CHEVRON Diesel Fuel No. 2

CONTAINING

100.0 % PETROLEUM MID-DISTILLATE
CAS68476346

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company
PEL - Permissible Exposure Limit
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: FUEL OIL, NO. 2
DOT HAZARD CLASS: COMBUSTIBLE LIQUID
DOT IDENTIFICATION NUMBER: NA1993

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; YES
2. Delayed (Chronic) Health Effects; YES
3. Fire Hazard; YES
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

REGULATORY LISTS:

01=SARA 313 02=MASS RTK 03=NTP Carcinogen
04=CA Prop. 65 05=MI 406 06=IARC Group 1

Revision Number: 9 Revision Date: 09/02/89 MSDS Number: 000525
NDA - No Data Available NA - Not Applicable

07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
NDA.
SKIN IRRITATION:
NDA.
DERMAL TOXICITY:
The dermal LD50 in rabbits is > 5 ml/kg.
RESPIRATORY/INHALATION:
NDA. The hazard evaluation was based on data from similar materials.
INGESTION:
The oral LD50 in rats is > 5 ml/kg.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains a mixture of petroleum hydrocarbons called middistillates. Toxicology data developed for similar mid-distillates support the conclusion that this material may pose an increased risk of skin cancer following prolonged or repeated skin contact.

Brief or intermittent skin contact with this product is not expected to produce any serious effects if it is washed from the skin. While normal handling of this product is not likely to cause cancer in humans, skin contact and breathing of mists, fumes or vapors should be reduced to a minimum.

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Revision Number: 9 Revision Date: 09/02/89 MSDS Number: 000525
NDA - No Data Available NA - Not Applicable

MATERIAL SAFETY DATA SHEET

N/AP = Not Applicable
N/AV = Not Available

DIESEL FUEL
SEC. 1

MSDS 525

SECTION 1—PRODUCT IDENTIFICATION AND USE

PRODUCT IDENTIFIER: Chevron Diesel Fuel No. 2	PRODUCT IDENTIFICATION NUMBER (PIN): UN 1202
PRODUCT USE: Fuel	
SUPPLIER'S NAME: Chevron Canada Limited	MANUFACTURER'S NAME: Chevron Canada Limited
STREET ADDRESS: 1500 - 1050 West Pender Street	STREET ADDRESS: 1500 - 1050 West Pender Street
CITY: Vancouver / PROVINCE: B.C.	CITY: Vancouver / PROVINCE: B.C.
POSTAL CODE: V6E 3T4 / EMERGENCY TELEPHONE NO.: 1-800-457-2022	POSTAL CODE: V6E 3T4 / EMERGENCY TELEPHONE NO.: 1-800-457-2022

SECTION 2—HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS NUMBER	LD_{50} OF INGREDIENT (SPECIFY SPECIES AND ROUTE)	LC_{50} OF INGREDIENT (SPECIFY SPECIES)
Fuels, diesel, No. 2	100	68476346	9.0 ml/kg, rat, acute oral	N/AV

SECTION 3—PHYSICAL DATA

PHYSICAL STATE: Liquid	ODOUR AND APPEARANCE: pale yellow liquid with a petroleum odour			ODOUR THRESHOLD (ppm): N/AV
VAPOUR PRESSURE (mm Hg): 0.04 psia @ 40°C	VAPOUR DENSITY (AIR=1): N/AV	EVAPORATION RATE: N/AV	BOILING POINT (°C): 176 - 370°C	FREEZING POINT (°C): N/AV
pH: N/AV	SPECIFIC GRAVITY: (typical) 0.84 @ 15.6/15.6°C	COEFF. WATER/OIL DIST.: N/AV		

NOV 13 '95 8:56 FROM CHEVRON MKTG ADMIN PAGE.002

SECTION 4—FIRE AND EXPLOSION DATA

FLAMMABILITY YES [X] NO [ ] IF YES, UNDER WHICH CONDITIONS? Combustible–Liquid evaporates and forms vapour (fumes) that can catch fire and burn with explosive violence. Fire hazard is greater as liquid temperature rises above 85°F.

MEDIA OF EXTINCTION CO_2, dry chemical, foam and water fog.

FLASH POINT (°C) AND METHOD	UPPER FLAMMABLE LIMIT (% BY VOLUME)	LOWER FLAMMABLE LIMIT (% BY VOLUME)
52°C (P-M)	N/AV	N/AV
AUTOIGNITION TEMPERATURE (°C)	HAZARDOUS COMBUSTION PRODUCTS	
N/AV	Carbon Monoxide	
EXPLOSION DATA: SENSITIVITY TO IMPACT N/AV	SENSITIVITY TO STATIC DISCHARGE N/AV	

SECTION 5—REACTIVITY DATA

CHEMICAL STABILITY YES [X] NO [ ] IF NO, UNDER WHICH CONDITIONS?

INCOMPATIBILITY WITH OTHER SUBSTANCES YES [X] NO [ ] IF SO, WHICH ONES? May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

REACTIVITY, AND UNDER WHAT CONDITIONS N/AV

HAZARDOUS DECOMPOSITION PRODUCTS N/AV

SECTION 6—TOXICOLOGICAL PROPERTIES

TYPE OF ENTRY SKIN CONTACT [X] SKIN ABSORPTION [ ] EYE CONTACT [ ] INHALATION [X] INGESTION [ ]

EFFECTS OF ACUTE EXPOSURE TO PRODUCT

This substance is a moderate skin irritant, so contact with the skin could cause prolonged (days) injury to the affected area. The degree of injury will depend on the amount of material that gets on the skin and the speed and thoroughness of the first aid treatment. Signs and symptoms may include pain or a feeling of heat, discoloration, swelling and blistering.
Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed. This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT

Prolonged breathing of vapours can cause central nervous system effects. Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination.
Not expected to cause prolonged or significant eye irritation and should be practically nontoxic to internal organs if it gets on skin or is swallowed. The dermal LD50 in rabbits is >5 ml/kg and the oral LD50 in rats is >5 ml/kg.

EXPOSURE LIMITS	TERATOGENICITY
N/AV	N/AV
IRRITANCY OF PRODUCT	REPRODUCTIVE TOXICITY
Yes. See Effects of Acute Exposure to Product	N/AV
SENSITIZATION TO PRODUCT	MUTAGENICITY
/AV	See Section 9
CARCINOGENICITY	SYNERGISTIC PRODUCTS
See Section 9	N/AV

PRODUCT IDENTIFIER Chevron Diesel Fuel No. 2

SECTION 7—PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

GLOVES (SPECIFY)
Nitrile, Viton, polyvinyl alcohol (avoid contact with water, as polyvinyl alcohol gloves deteriorate in water).

RESPIRATOR (SPECIFY)
This material may be an inhalation hazard and, unless ventilation is adequate, the use of an air-purifying respirator with an organic vapour cartridge is recommended.

EYE (SPECIFY)
None

FOOTWEAR (SPECIFY)
N/AV

CLOTHING (SPECIFY)
Protective Clothing

OTHER (SPECIFY)
N/AV

ENGINEERING CONTROLS (SPECIFY, E.G. VENTILATION, ENCLOSED PROCESS)
Use this material only in well ventilated areas.

LEAK AND SPILL PROCEDURE This material is considered to be a water pollutant, and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. Eliminate all open flame in vicinity of spill or released vapour. Stop the source of the leak or release. Clean up spills as soon as possible, observing precautions in Section 7 Preventive Measures. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

WASTE DISPOSAL
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

HANDLING PROCEDURES AND EQUIPMENT DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapour or liquid. CAUTION! Do not use pressure to empty drum or drum may rupture with explosive force.
WARNING! Not for use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

STORAGE REQUIREMENTS
DO NOT STORE near flames, sparks or hot surfaces.

SPECIAL SHIPPING INFORMATION
N/AV

SECTION 8—FIRST AID MEASURES

SPECIFIC MEASURES

Eye Contact: No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.

Skin Contact: Remove contaminated clothing and wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.

Inhalation: If any signs or symptoms described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor.

Ingestion: If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment centre or hospital. Note to Physician: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

SECTION 9—ADDITIONAL HEALTH DATA

This product contains a mixture of petroleum hydrocarbons called middle distillates (which means they boil between approximately 350°F and 700°F). Because of this broad description, many products are considered middle distillates yet they are produced by a variety of different petroleum refining processes. Toxicology data developed on some middle distillates found that they caused positive responses in some mutagenicity tests and caused skin cancer when repeatedly applied to mice over their lifetime. This product may contain some middle distillates found to cause those adverse effects.

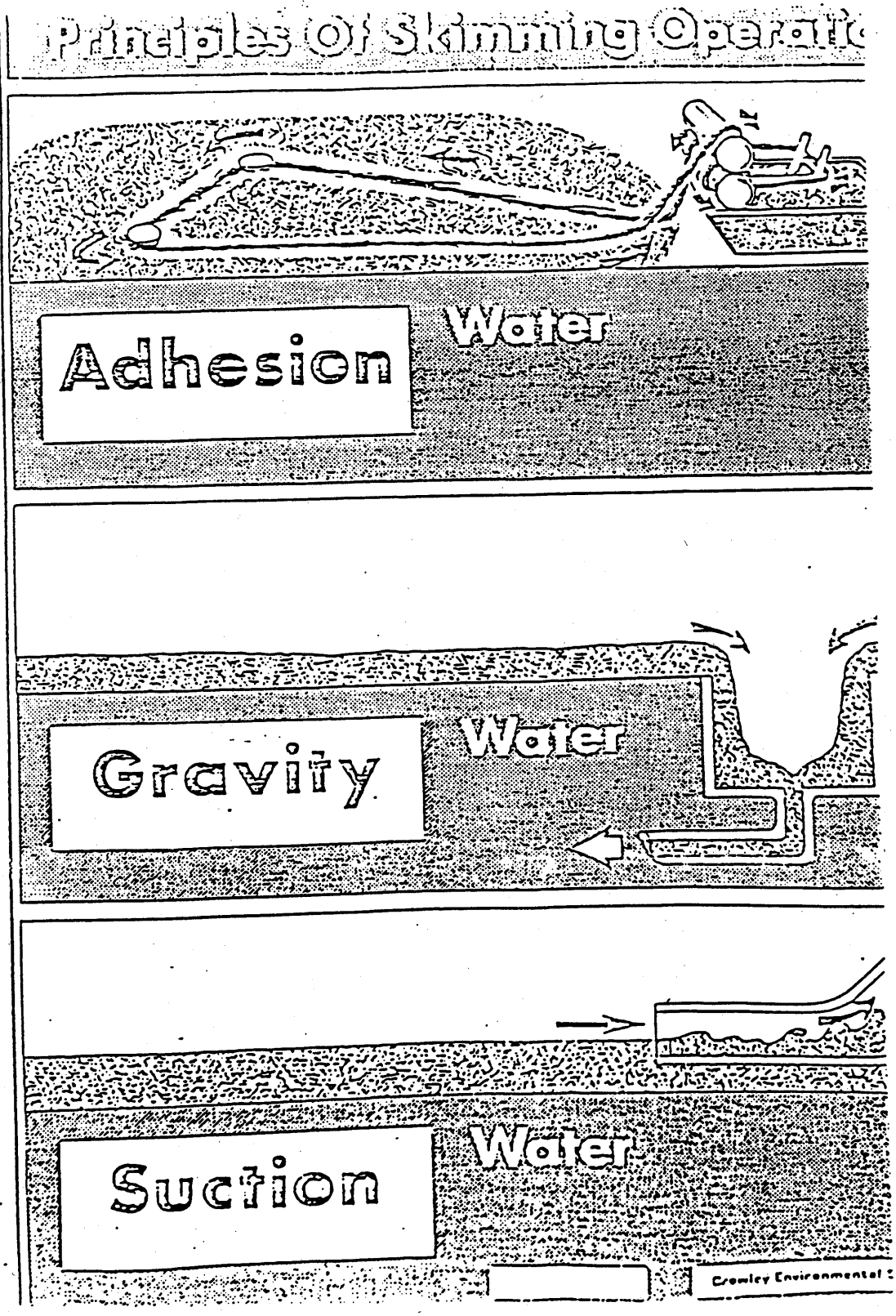
Whole diesel engine exhaust was reviewed by the International Agency for Research on Cancer (IARC) in their Monograph 46 (1989). Evidence for causing cancer was considered sufficient in animals and limited in humans. IARC placed this material in Category 2A, considering it probably carcinogenic to humans.

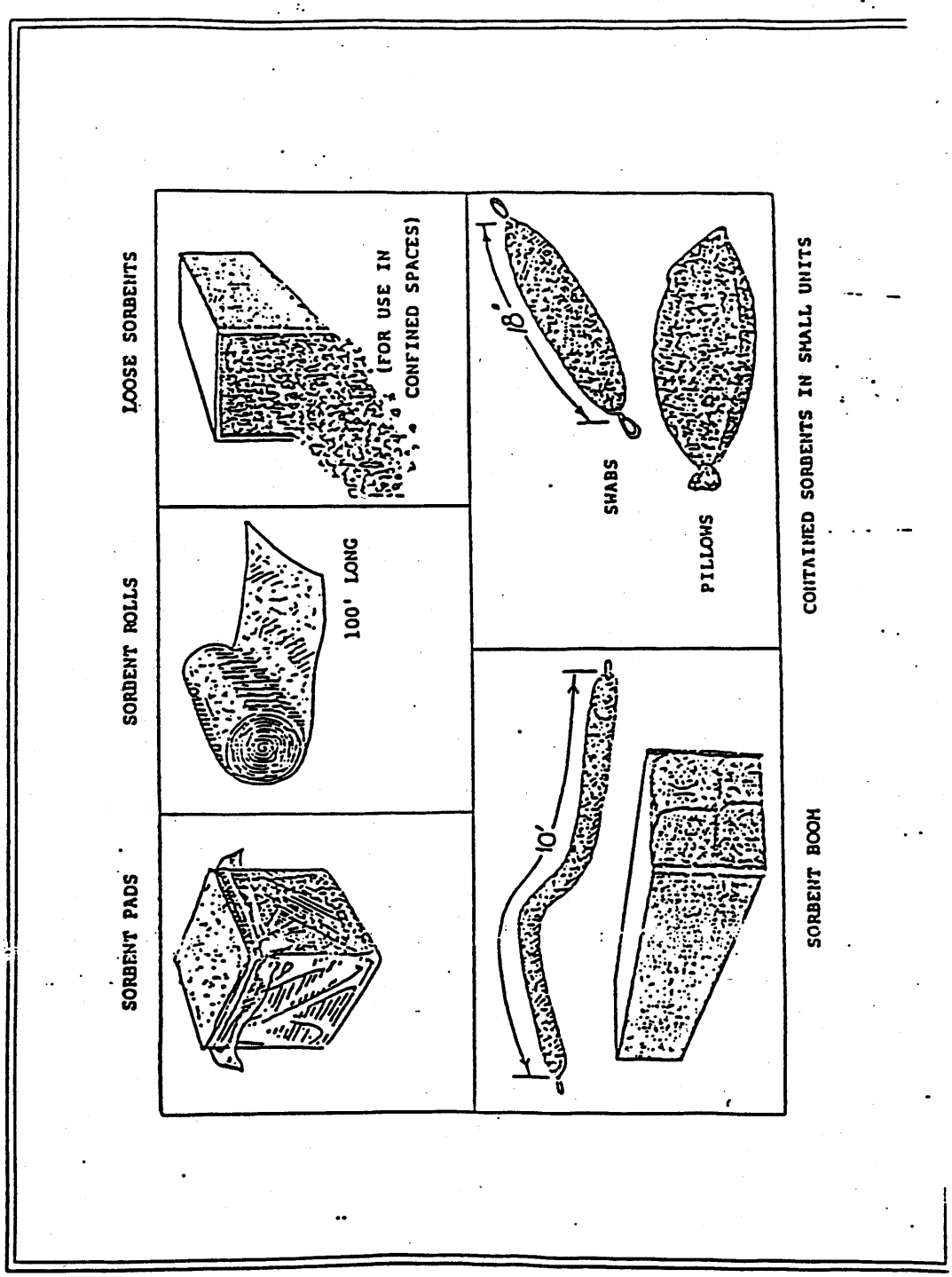
The National Institute of Occupational Safety and Health (NIOSH) has recommended the whole diesel exhaust be regarded as potentially causing cancer. This recommendation was based on test results showing increased lung cancer in laboratory animals exposed to whole diesel exhaust. The excess risk of cancer for people exposed to diesel exhaust has not been determined, as studies on exposed workers have been inconclusive. It is recommended that exposure to diesel exhaust be minimized to reduce the potential cancer risk.

PREPARATION DATE OF MSDS

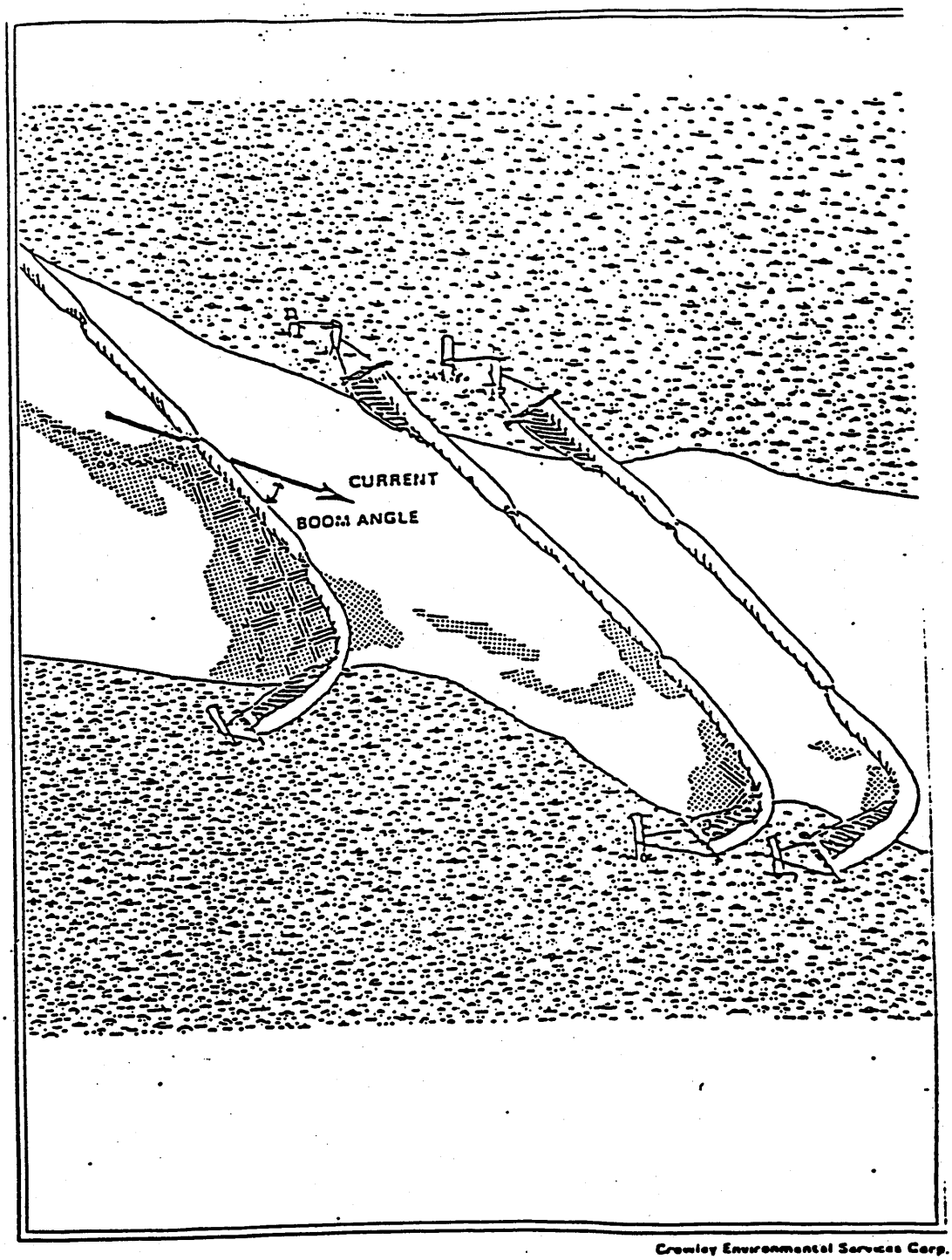
PREPARED BY (GROUP, DEPARTMENT, ETC.)	PHONE NUMBER	DATE
Chevron Canada Limited	(604) 668-5554	April 24, 1992

Petroleum Containment Procedures

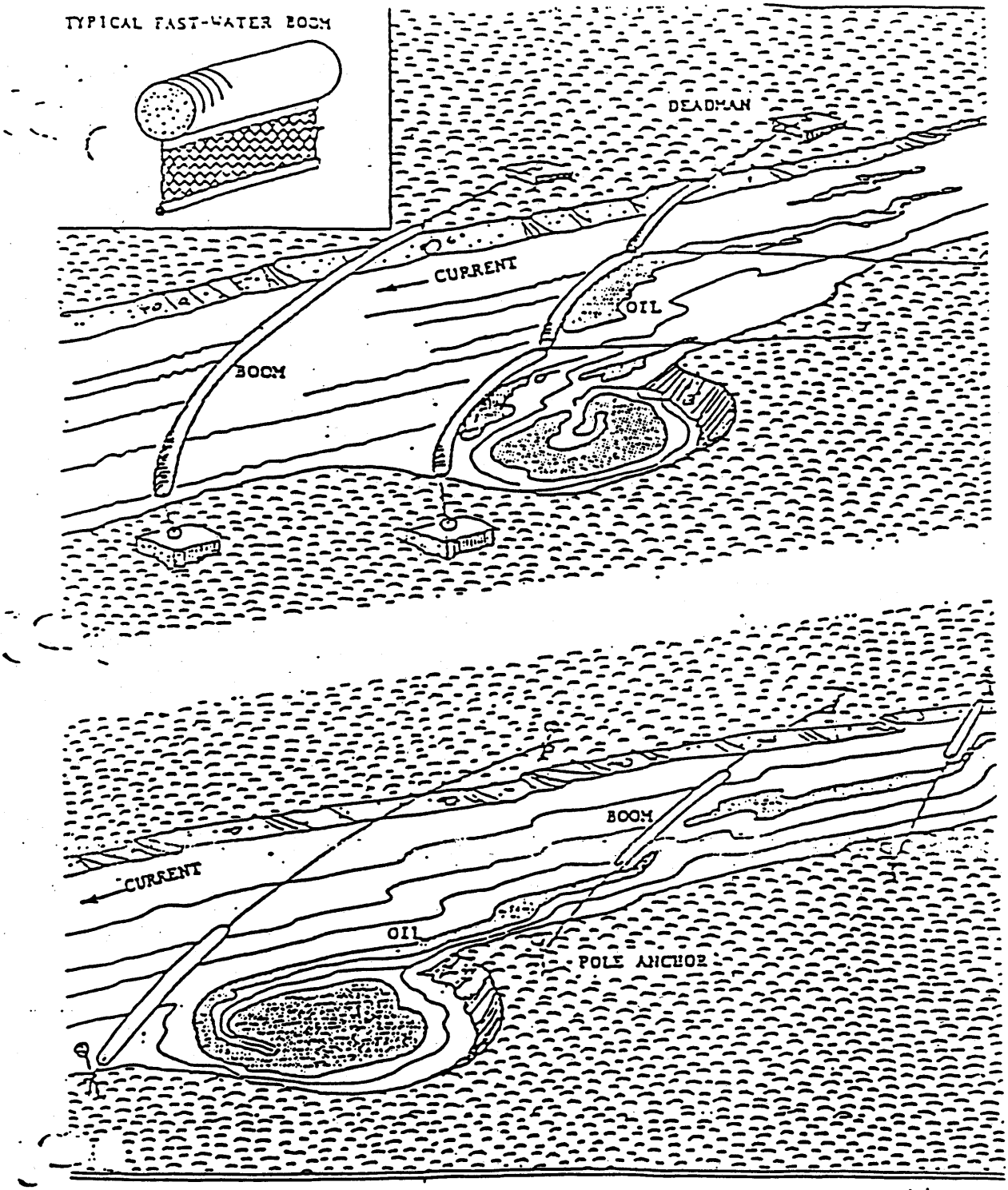

Principles Of Skimming Operati
Adhesion
Water
Gravity
Water
Suction
Water
Crowley Environmental



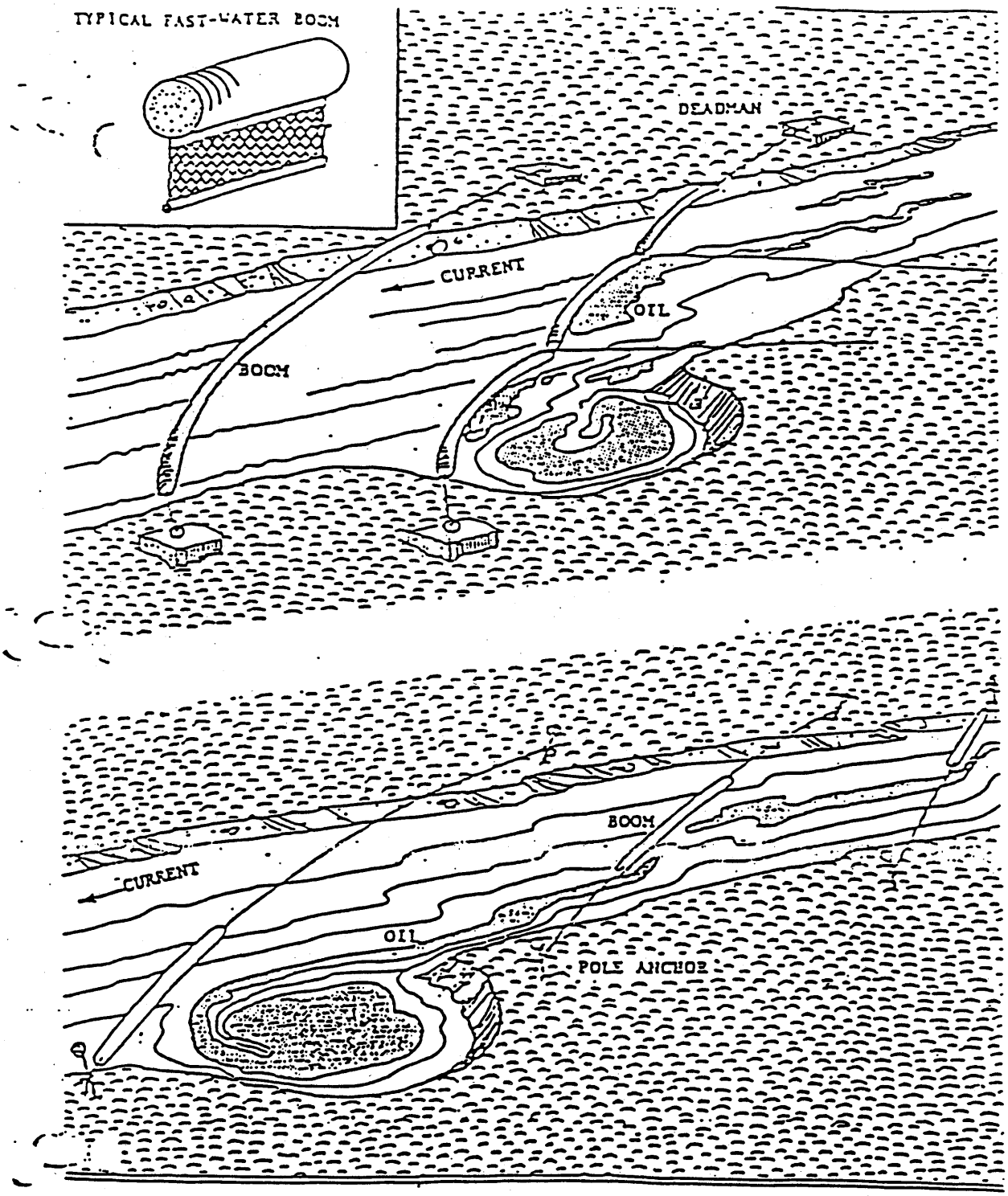
Sorbent Types



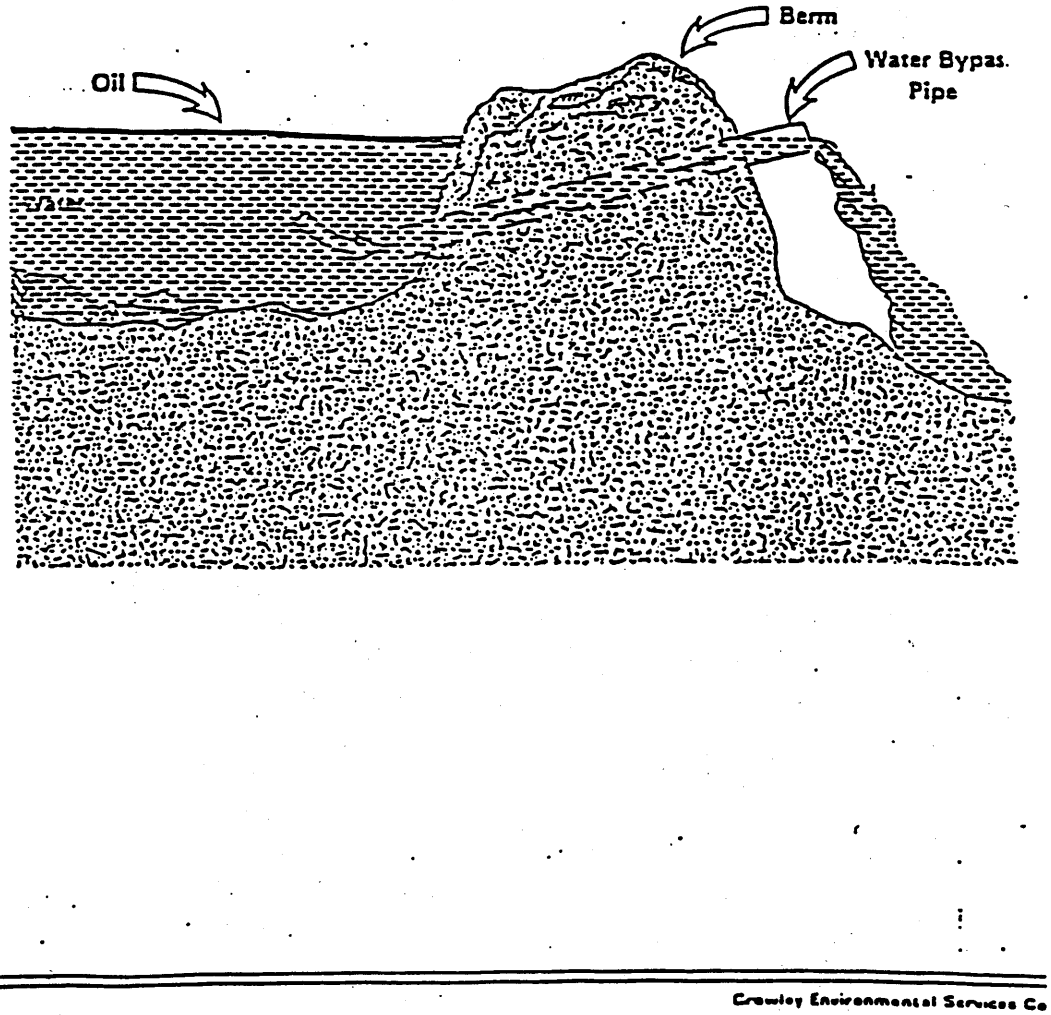
Boom Deployment on River or Stream



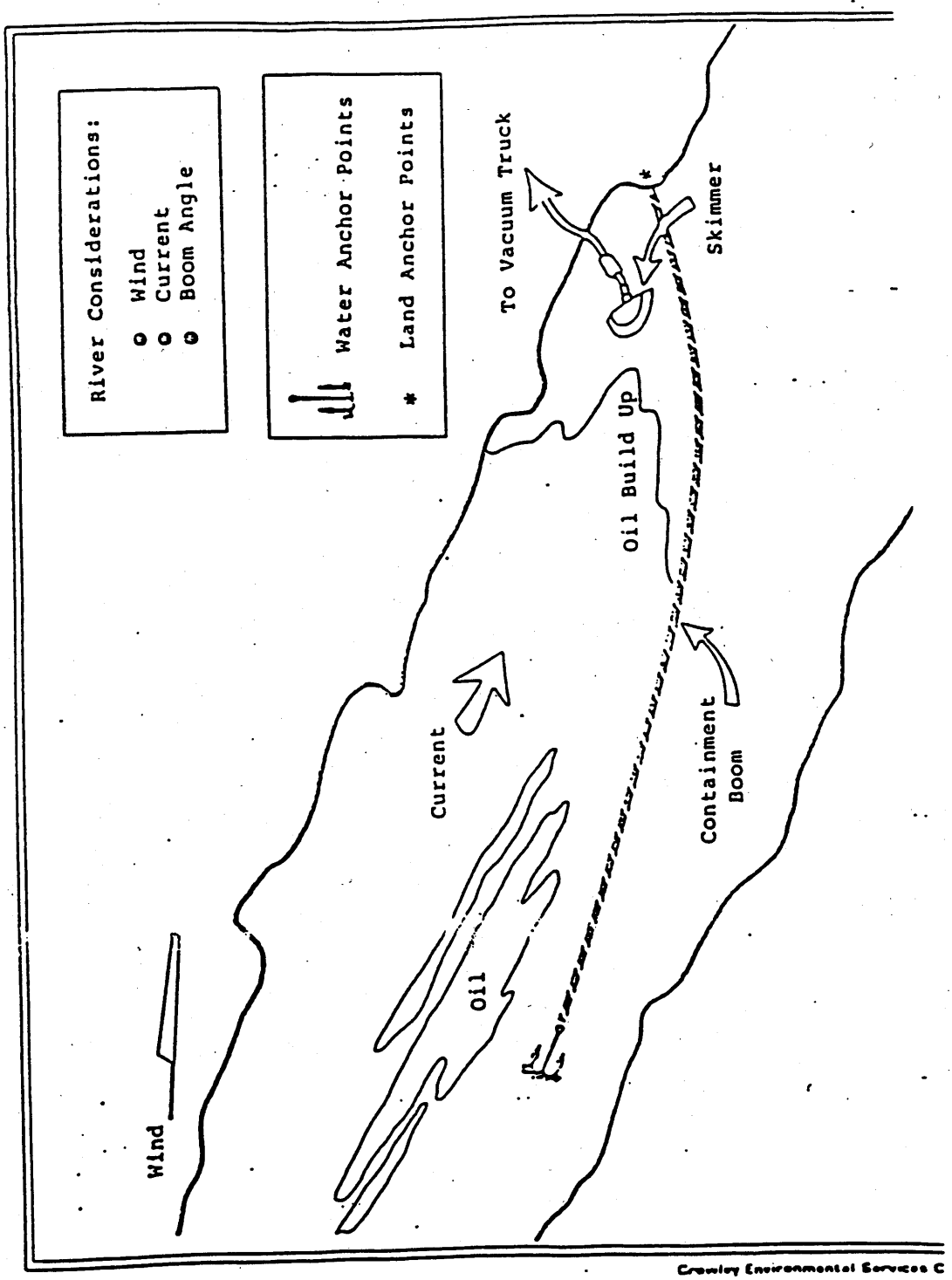
STREAM BOOMING

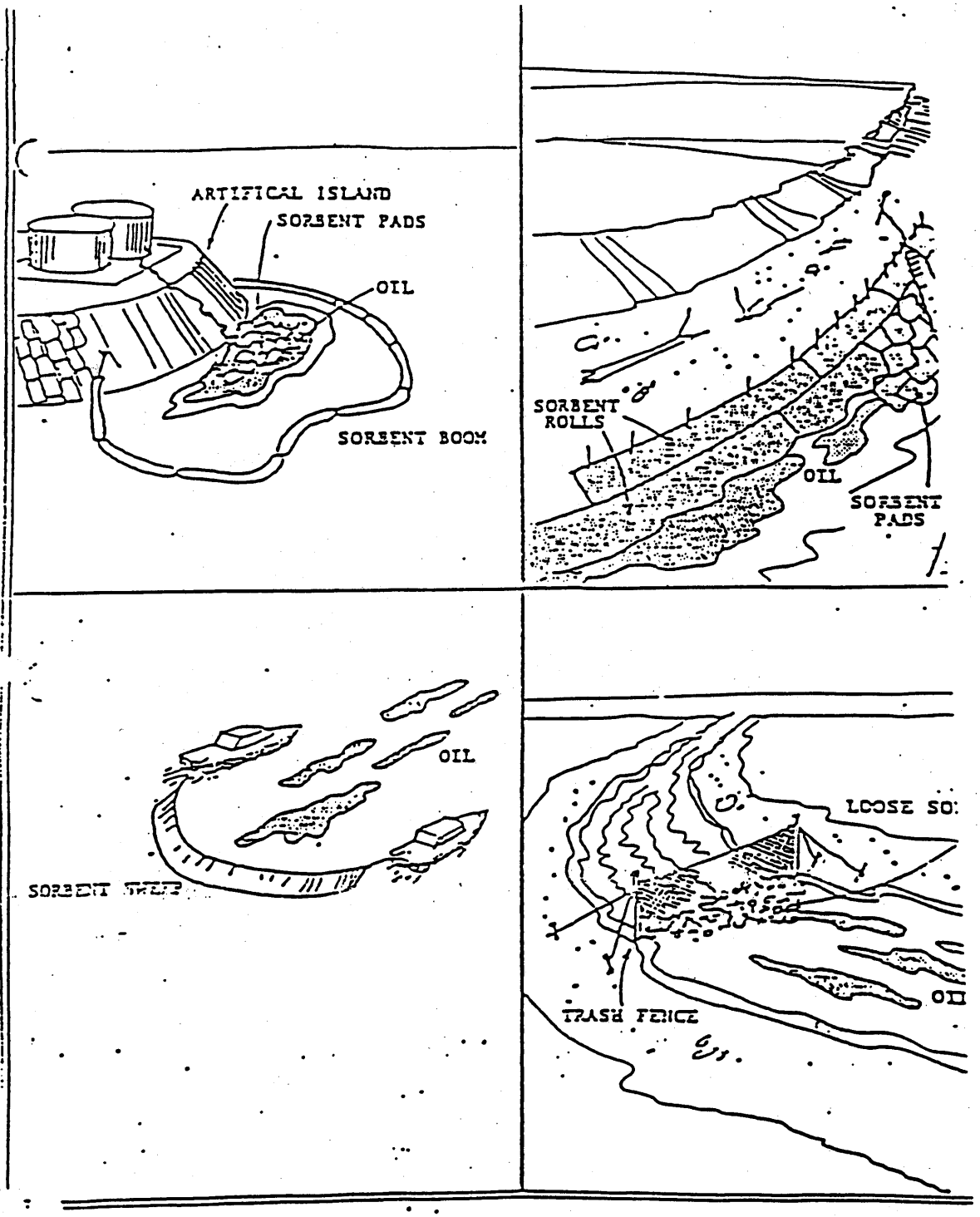


STREAM BOOMING



Earth Berm with Water Bypass


River Considerations:
Wind
Current
Boom Angle
Water Anchor Points
Land Anchor Points
To Vacuum Truck
Skimmer
Oil Build Up
Current
Containment Boom
Oil
Wind
Crowley Environmental Services C



EXAMPLES OF GENERAL SORBENT USE

ESTIMATED MINIMUM PRODUCT LOSS DUE TO SMALL LEAKS

(at practically nil pressure head)

ONE DROP/SECOND	ONE	MINUTE	LOSS IS	1/10	OUNCE
	ONE	HOUR	" "	6	OUNCES
	ONE	DAY	" "	1 1/8	GALLONS
	ONE	WEEK	" "	7 7/8	GALLONS
	ONE	MONTH	" "	34	GALLONS
TWO DROPS/SECOND	ONE	MINUTE	LOSS IS	1/3	OUNCE
	ONE	HOUR	" "	20	OUNCES
	ONE	DAY	" "	3 3/4	GALLONS
	ONE	WEEK	" "	26 ½	GALLONS
	ONE	MONTH	" "	112 ½	GALLONS
STREAM BREAKING TO DROPS	ONE	MINUTE	LOSS IS	2	OUNCES
	ONE	HOUR	" "	1	GALLON
	ONE	DAY	" "	24	GALLONS
	ONE	WEEK	" "	168	GALLONS
	ONE	MONTH	" "	720	GALLONS
1/16" STREAM	ONE	MINUTE	LOSS IS	7 ½	OUNCES
	ONE	HOUR	" "	3 ½	GALLONS
	ONE	DAY	" "	84	GALLONS
	ONE	WEEK	" "	588	GALLONS
	ONE	MONTH	" "	2,520	GALLONS
1/8" STREAM	ONE	MINUTE	LOSS IS	23	OUNCES
	ONE	HOUR	" "	10	GALLONS
	ONE	DAY	" "	240	GALLONS
	ONE	WEEK	" "	1,680	GALLONS
	ONE	MONTH	" "	7,200	GALLONS
3/16" STREAM	ONE	MINUTE	LOSS IS	39	OUNCES
	ONE	HOUR	" "	18 ½	GALLONS
	ONE	DAY	" "	438	GALLONS
	ONE	WEEK	" "	3,066	GALLONS
	ONE	MONTH	" "	13,140	GALLONS
1/4" STREAM	ONE	MINUTE	LOSS IS	83	OUNCES
	ONE	HOUR	" "	39	GALLONS
	ONE	DAY	" "	936	GALLONS
	ONE	WEEK	" "	6,552	GALLONS
	ONE	MONTH	" "	28,080	GALLONS

SECTION 2

Latest Revision - November 10, 1995

SODIUM CYANIDE

2.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

2.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

2.3 INITIAL SPILL RESPONSE

a) Stop the spill if possible.

b) Test for presence of hydrocyanic acid (HCN) gas using Draeger, or similar, detector (Monitox).

c) Do not enter area containing sodium cyanide dust or HCN gas without self-contained breathing apparatus.

d) Prevent solid sodium cyanide from contacting acid, acid salts or water.

e) If sodium cyanide does contact water, contain solution to as small an area as possible. Consider dyking and/or covering.

f) If HCN gas is being produced, wear protective clothing and self-contained breathing apparatus, ventilate area and add hydrated lime (calcium hydroxide) or quicklime (calcium oxide) at 5 lb./100 gal. water to slow reaction.

g) Isolate area of spill, preferably by roping off affected area and posting appropriate hazard signs.

h) Remain upwind.

2.4 HAZARDS

a) Extremely toxic by ingestion, or inhalation of dust or HCN gas. HCN gas has a characteristic almond-like odor.

b) Liberates highly toxic HCN gas if sodium cyanide comes in contact with any acid or acid salts.

c) Contact with carbon dioxide (CO_2) produced HCN gas in lesser, but possibly dangerous quantities.

d) Contact with water may also produce HCN gas.

e) HCN gas can be absorbed through the skin.

f) Corrosive to skin, due to strong alkalinity.

2.5 ACTION FOR FIRE

a) If possible, remove sodium cyanide from the area of the fire.

b) Sodium cyanide is not flammable and will not support combustion, however, HCN gas is flammable.

c) Do not use carbon dioxide (CO_2) extinguishers to fight a fire involving sodium cyanide, as this may produce toxic and flammable HCN gas. Dry chemical or foam extinguishers may be used.

d) If water is used to fight a fire involving sodium cyanide, treat runoff as though it were a spill of sodium cyanide solution. Do not allow runoff to reach a stream. Take precautions to avoid breathing HCN gas which may be released.

2.6 RECOVERY

a) Spills of solid sodium cyanide on dry surfaces can be shoveled into containers. Crews should wear dust masks while shoveling or sweeping up spills.

b) Spills of solid sodium cyanide on wet or snow surfaces or exposed to rain should be shoveled into waterproof containers as soon as possible to minimize the quantity of sodium cyanide being dissolved. Affected area should be sprayed with solution of lime and sodium hypochlorite (household bleach) or lime and hydrogen peroxide to neutralize cyanide.

c) Sodium cyanide, as a solid or in solution, must not be allowed access to any watercourse, as its recovery is then virtually impossible.

d) Soil contaminated with sodium cyanide should be excavated if the affected groundwater threatens to travel to a watercourse.

e) Solutions of sodium cyanide which are not recovered can be neutralized by addition of lime and hypochlorite or hydrogen peroxide.

f) Sorbents such as Hazorb may be used to contain and recover spilled solutions.

2.7 DISPOSAL

a) Solid sodium cyanide recovered from a spill may be used in the mill if it is of acceptable quality.

b) All sodium cyanide solutions recovered from spills, and soil containing sodium cyanide should be disposed of in the tailings pond or to the mill circuits under the direction of the Mill Superintendent.

c) Solutions of sodium cyanide may be gelled by adding hydroxyethyl cellulose powder in the ratio of 0.4 parts by weight to 1.0 parts of NaCN liquor using a dry shovel working from the edge of the spill inwards.

2.8 PROPERTIES

a) Chemical formula NaCN.

b) White solid (pellets or briquettes).

c) Very soluble in water.

d) Aqueous solution is strongly alkaline.

e) Solid sodium cyanide absorbs moisture from the air and will eventually form a solution.

2.9 ENVIRONMENTAL THREAT

a) Very toxic to fish and other forms of aquatic life at low concentrations.

b) Toxic to humans and wildlife which may drink the water.

2.10 CONTAINERS

a) Transported and stored in 1,000 kg disposable plastic lined plywood boxes (Degussa "Bag and Crate") or 1,360 kg returnable steel containers (Dupont "FLO-BIN").

2.11 SUPPLIER

See Section D.

DUPONT CANADA INC.

MATERIAL SAFETY DATA SHEET

MATERIAL IDENTIFICATION Sodium Cyanide

MSDS NUMBER : CEC00007
CORPORATE NUMBER : DU000290

"CYANOBRIK", "CYANOGRAN", & "CYANO-DOL" are registered trademarks of Du Pont.

Revision Date : 16-May-91
Date Printed : 31-May-91

MANUFACTURER/DISTRIBUTOR
Du Pont Canada Inc.
P.O. Box 2200
Mississauga
Ontario
L5M 2H3

PHONE NUMBERS
PRODUCT INFORMATION : 1-(800)387-2122
TRANSPORT EMERGENCY : 1-(613)348-3616
MEDICAL EMERGENCY : 1-(613)348-3616

GRADE : "CYANOBRIK", "CYANOGRAN", "CYANO-DOL", COMPOUNDERS GRADE
CHEMICAL FAMILY : ALKALI METAL CYANIDE

TRADE NAMES / SYNONYMS
Cyanide of Sodium
Prussiate of Soda

CAS NAME : SODIUM CYANIDE
CAS NUMBER : 143-33-9
FORMULA : NaCN
TSCA INVENTORY STATUS : Reported/Included
NFPA RATINGS : Health: 3 Flammability: 0 Reactivity: 1
NPCA-HMIS RATINGS : Health: 3 Flammability: 0 Reactivity: 1
Personal Protection rating to be supplied by user depending on use conditions.

WHMIS CLASSIFICATION
CLASS D Division 1 Subdivision A : Very Toxic Material/Acute Lethality
CLASS D Division 2 Subdivision B : Toxic Material. Skin or Eye Irritant.

NOTICE FROM DU PONT: The information on this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

MSDS No. CEC00007 DU PONT Page
Material Safety Data Sheet

COMPONENTS

Material	CAS Number	%
Sodium Cyanide	143-33-9	100

DSL: REPORTED/ INCLUDED

PHYSICAL DATA

Boiling Point	: 1496 deg C (2725 deg F) at 760 mm Hg.
Vapor Pressure	: Negligible
Vapor Density	: Not volatile
Melting Point	: 564 deg C (1047 deg F)
Water Solubility	: 37 WT % at 20 deg C (68 deg F)
pH	: 11.3-11.7 Typical for 5-25% solutions-no pH adjustment
Form	: Solid, granular or briquettes
Color	: White
Specific Gravity	: 1.6
Odor	: None (but can have slight ammonia and/or HCN odor if damp).

HAZARDOUS REACTIVITY

Instability	: Very stable when dry.
Decomposition	: Moisture will cause slow decomposition, releasing poisonous HCN and ammonia gases.
Polymerization	: Polymerization will not occur.
Incompatibility	: Large amounts of poisonous, flammable hydrogen cyanide (HCN) gas will be evolved from contact with acids. Reacts violently with strong oxidizing agents. Water or weak alkaline solution can produce dangerous amounts of HCN in confined areas.

FIRE AND EXPLOSION DATA

Will not burn.

FIRE AND EXPLOSION HAZARDS

Will not burn. Sodium cyanide will not be destroyed in an ordinary fire involving combustible materials such as paper or wood. Follow appropriate National Fire Protection Association (NFPA) codes.

Degussa Canada Ltd.

MATERIAL SAFETY DATA SHEET

SODIUM CYANIDE

VOLATILITY/VOL(%).....	NOT AVAILABLE
pH.....	NOT AVAILABLE
DENSITY (g/ml).....	NOT AVAILABLE
COEFF. OF WATER/OIL DISTRIBUTION	NOT AVAILABLE

FIRE AND EXPLOSION HAZARD OF PRODUCT

CONDITIONS OF FLAMMABILITY.....	MATERIAL DOES NOT IGNITE READILY. WHEN BURNING GIVES OFF HIGHLY TOXIC & FLAMMABLE GASES UPON CONTACT WITH WATER, STEAM OR ACID.
MEANS OF EXTINCTION.....	SMALL FIRES: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM. LARGE FIRES: WATER SPRAY, FOG OR FOAM. MOVE CONTAINER FROM FIRE AREA, IF POSSIBLE TO DO SO WITHOUT RISK. FIGHT FIRE FROM MAXIMUM DISTANCE. DIKE FIRE CONTROL WATER FOR LATER DISPOSAL. DO NOT SCATTER MATERIAL.
SPECIAL PROCEDURES.....	KEEP UNNECESSARY PEOPLE AWAY, ISOLATE HAZARD AREA & DENY ENTRY. STAY UPWIND: KEEP OUT OF LOW AREAS. VENTILATE CLOSED SPACES BEFORE ENTERING THEM. WEAR POSITIVE PRESSURE BREATHING APPARATUS & SPECIAL PROTECTIVE CLOTHING.
FLASHPOINT (C)/METHOD.....	NOT AVAILABLE
UPPER EXPLOSION LIMIT (%).....	NOT AVAILABLE
LOWER EXPLOSION LIMIT (%).....	NOT AVAILABLE
AUTO-IGNITION TEMPERATURE (C)...	NOT AVAILABLE
HAZARDOUS COMBUSTION PRODUCTS...	HYDROGEN CYANIDE.
EXPLOSION DATA.....	NOT AVAILABLE
SENSITIVITY TO STATIC DISCHARGE.	NOT AVAILABLE

REACTIVITY DATA

CHEMICAL STABILITY.....	STABLE. HAZARDOUS POLYMERIZATION WILL NOT OCCUR.
INCOMPATIBLE MATERIALS.....	ACID. OXIDIZERS.
CONDITIONS OF REACTIVITY.....	STABLE. AVOID WATER. OXIDIZERS. AVOID ACIDS INCLUDING CARBON DIOXIDE.
HAZARDOUS DECOMPOSITION PRODUCTS	HYDROGEN CYANIDE.

TOXICOLOGICAL PROPERTIES OF PRODUCT

ROUTES OF ENTRY

SKIN CONTACT.....	NO
SKIN ABSORPTION.....	YES
EYE CONTACT.....	NO
INHALATION.....	YES
INGESTION.....	YES

Degussa
Canada Ltd.

MATERIAL SAFETY DATA SHEET

SODIUM CYANIDE

MATERIAL IDENTIFICATION AND USE

MANUFACTURER'S NAME	DEGUSSA AG
MANUFACTURER'S ADDRESS	P.O. BOX 1105 33 D-6000, FRANKFURT 11 WEST GERMANY
EMERGENCY PHONE NUMBER	CANUTEC: (613) 996-6666 (24 HRS.) ERP#2-0053 INFORMATION: (416) 336-3423
SUPPLIER IDENTIFICATION	DEGUSSA CANADA LTD.
SUPPLIER'S ADDRESS	P.O. BOX 5097 4261 MAINWAY DRIVE BURLINGTON, ONTARIO L7R 3Y8
SUPPLIER EMERGENCY PHONE NUMBER	SANIVAN (514) 353-4357
TRADE NAME	SODIUM CYANIDE
CHEMICAL NAME	SODIUM CYANIDE
CHEMICAL FAMILY	INORGANIC CYANIDES.
MOLECULAR WT.	49.01
CHEMICAL FORMULA	NaCN
PRODUCT USE	NOT AVAILABLE
SYNONYMS	1) CYANIDE OF SODIUM 2) CYANOGRAN 3) HYDROCYANIC ACID, SODIUM SALT

HAZARDOUS INGREDIENTS OF MATERIALS

HAZARDOUS INGREDIENTS	SODIUM CYANIDE
CONCENTRATION (%)	98% TO 99%
CAS NUMBER	143-33-9
TLV (UNITS)	5 mg/m3, SKIN(CN)
LD50/LC50	15 mg/kg, RAT,ORAL

PHYSICAL DATA FOR PRODUCT

PHYSICAL STATE	SOLID
ODOUR AND APPEARANCE	WHITE SOLID. SLIGHT AMMONIA OR BITTER ALMOND ODOUR.
ODOUR THRESHOLD	NOT AVAILABLE
SPECIFIC GRAVITY	1.6
VAPOUR PRESSURE	1 mmHg @ 817 DEGREES C.
VAPOUR DENSITY (air=1)	NOT AVAILABLE
EVAPORATION RATE	NOT AVAILABLE
BOILING POINT (C)	1496 DEGREES C.
MELTING POINT (C)	563.7 DEGREES C,
SOLUBILITY IN WATER	SOLUBLE

(ADDITIONAL INFORMATION AND REFERENCES - Continued)

paragraph 1 of FIRST AID).

The EPA has listed sodium cyanide under TSCA 8(d).

For further information, see Du Pont Sodium Cyanide Storage and Handling Bulletin.

Responsibility for MSDS : CHEMICALS & PIGMENTS
MISSISSAUGA, ONTARIO
416-821-3300

End of MSDS

(TITLE III HAZARD CLASSIFICATIONS - Continued)

sodium nitrite (10 mL of a 3% solution) intravenously at the rate of 2.5 mL/minute, then immediately inject the sodium thiosulfate (50 mL of a 25% solution) at the same rate, taking care to avoid extravasation. This is a fairly lengthy treatment (24 minutes) since a total of 10 + 50, or 60 mL, is injected at a rate of 2.5 mL per minute.

Consideration should be given to the size and condition of the patient as treatment is proceeding. The above sodium nitrite injection is about 1/3 of a lethal dose (see below), so care should be taken to avoid excessive use. It is not essential that full quantities be given, just because treatment was started. Injections can be stopped at any point if recovery is evident, but be sure to keep track of quantities administered in case treatment needs to be restarted. Relapse is abnormal if cyanide intake is not continuing, unless a large intake from swallowing occurred.

Don't overreact. While prompt treatment is essential where poisoning has occured, treatment of a lucid, conscious patient would rarely be neccessary. The effects of cyanide poisoning are immediat, not delayed, and a conscious person that con communicate does not have significant cyanide poisoning.

For most accidental poisoning, complete recovery occurs within 1-2 hours. If cyanide exposure was severe, watch patient continuously for 24-48 hours. If there is any return of symptoms during this period, consider repeating this treatment using one half the amounts of sodium nitrite and sodium thiosulfate solutions. Blood chemistry should be monitored during prolonged treatment. Caution should be used to prevent overuse of medical treatment chemicals as the prescribed dose is about 1/3 the lethal dose for an average individual. The nitrite converts hemoglobin to methemoglobin which reduces the oxygen carrying capacity of the blood. This is done purposely as methemoglobin attracts cyanide away from the body cells, but nitrite use must be limited to prevent hemoglobin deficiency. Du Pont has not experienced nitrite overdose problems; but being alert to this is important information to medical personnel.

If signs of excess methemoglobinemia develop (i.e., blue skin and mucous membranes, vomiting, shock and coma), 1% methylene blue solution should be given intravenously. Administering up to a 1 to 2 mg/kg of body weight over a period of five to ten minutes should be considered and repeated in one hour if necessary. NOTE: This procedure can free cyanide from cyanomethemoglobin. The free cyanide can again bind with cytochrome oxidase and, therefore, repoison the patient. If methylene blue is used, it must be used very carefully. It is best to avoid overuse of nitrite so corrective action is not needed. Historically, Du Pont has not had to use methylene blue to counter excess nitrite

(TITLE III HAZARD CLASSIFICATIONS - Continued)

Lists:

Extremely Hazardous Substance	-	Yes
CERCLA Hazardous Substance	-	Yes
Toxic Chemical	-	Yes

**INFORMATION CONTINUED FROM NOTES TO PHYSICIAN SECTION

1. Amyl nitrite is highly volatile and flammable; do not smoke or use around source of ignition.

2. If treating patient in a windy or drafty area, provide something -a rag, shirt, wall, drum, cupped hand, etc. -to prevent the amyl nitrite vapors from being blown away. Keep the ampule upwind from the nose. The objective is to get amyl nitrite into the patient's lungs.

3. Rescuers should avoid amyl nitrite inhalation so they won't become dizzy and lose competence.

4. Lay the patient down for treatment to maintain a good blood supply to the patient's head. Since amyl nitrite dilates the blood vessels and lowers blood pressure, lying down will help prevent unconsciousness.

5. Do not overuse; excessive use might put the patient in shock. This has not occured in practice at Du Pont plants and we are not aware of any death or serious aftereffects from treatment with amyl nitrite. (See MEDICAL TREATMENT section)

2. Inhalation of Cyanide

Carry patient to fresh air. Lay patient down. Administer oxygen and amyl nitrite (section 1 of FIRST AID). Keep patient quiet and warm. Even with inhalation poisoning, thoroughly check clothing and skin to assure no cyanide is present. If cyanide is found on clothing or skin, proceed as in section 4b of FIRST AID. Call a physician. Rescuers of patients in an HCN environment should wear SCBA equipment.

3. Swallowing Cyanide

a. Conscious: Immediately give patient one pint of 1% sodium thiosulfate solution (or plain water) by mouth and induce vomiting by having patient stick finger into the throat. Repeat until vomit fluid is clear. Never give anything by mouth to an unconscious person Call a physician. Give oxygen.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES AND PRECAUTIONS

Good general ventilation should be provided to keep dust, mist, and HCN gas below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Recommended Minimum Protection: chemical splash goggles and rubber gloves (Butyl or Neoprene preferred.)

Have available and use as appropriate: face shield; rubber suits, aprons, and boots; disposable toxic dust and mist respirators; self-contained breathing air supply (in case of emergency); HCN detector; first aid and medical treatment supplies, including oxygen resuscitators.

DISPOSAL INFORMATION

AQUATIC TOXICITY

96-hour LC50 values range from 0.05-1.7 mg/L (several species). Based on cyanide concentrations (air versus water), cyanide appears to be more toxic to aquatic life than terrestrial life.

SPILL, LEAK, OR RELEASE

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Sweep up and shovel into a covered container or plastic bag, pending transfer, to secure the spill. Cover and keep spillage dry. Flush spill area with a dilute solution of sodium hypochlorite or calcium hypochlorite to destroy the cyanide. Comply with Federal, State, and local regulations on reporting releases. The EPA Reportable Quantity is 10 lbs.

WASTE DISPOSAL

This material may be a RCRA Hazardous Waste. Do not flush cyanide into sewers which may contain an acid. Detoxify with sodium hypochlorite, hydrogen peroxide, or calcium hypochlorite. Comply with Federal, State, and local regulations on disposal methods used to achieve the constituent based treatment standard, if permitted; or transfer to a licensed disposal contractor.

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Material Safety Data Sheet

(FIRST AID - Continued)

NOTES TO PHYSICIAN
*INFORMATION CONTINUED FROM FIRST AID SECTION

4. Two 1-pint bottles of 1% sodium thiosulfate solution for use in case of cyanide ingestion or plain water can be used.

MEDICAL TREATMENT KITS

Medical Treatment Kits for cyanide poisoning should be conveniently located for easy access by medical people. Materials for intravenous injection are intended for use only by a physician or fully qualified medical personnel. The location of kits should be carefully planned as part of the emergency preplan. Suggested loctaions for kits include:

- in or near the cyanide area
- plant medical station
- entrance guard house
- local hospital
- doctor's office and residence

CAUTION: Do not store amyl nitrite or Medical Treatment Kits on vehicles as heat build-up may ruin the amyl nitrite.

Kits and amyl nitrite should be accessible but secured against tampering. They should be inspected regularly and the amyl nitrite ampules replaced every 1-2 years. Medical Treatment Kits should contain the following:

1. One box containing one dozen amyl nitrite ampules.
2. Two sterile ampules of sodium nitrite solution (10 mL of a 3% solution in each).
3. Two sterile ampules of sodium thiosulfate solution (50 mL of a 25% solution in each).
4. One 10 mL sterile syringe. One 50 mL sterile syringe. Two sterile intravenous needles. One tourniquet.
5. One stomach tube.
6. One dozen gauze pads.
7. A set of cyanide instructions on first aid and medical treatment.

(HEALTH HAZARD INFORMATION - Continued)

Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures.

CARCINOGENICITY

None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

EXPOSURE LIMITS

Sodium Cyanide

AEL *	(Du Pont)	: None Established
TLV	(ACGIH)	: 5 mg/m3, as CN - 8 Hr TWA, skin
PEL	(OSHA)	: 5 mg/m3, as CN - 8 Hr TWA, skin
EV	(ONTARIO)	: *OTHER INFORMATION ON THE "SKIN" NOTATION IS CONTINUED IN THE ADDITIONAL INFORMATION SECTION

* AEL is Du Pont's Acceptable Exposure Limit.

SAFETY PRECAUTIONS

Emergency pre-planning and training are needed before beginning to work with sodium cyanide since prompt treatment is essential in cases of cyanide poisoning. Always have Cyanide Antidote Kits on hand.

Do not breath dust, mist, or HCN gas. Do not get in eyes. Avoid contact with skin and clothing. Do not carry foodstuffs, beverages, or tobacco where contamination with cyanide is possible. Wash thoroughly after handling. Wash contaminated clothing before reuse.

FIRST AID

FIRST AID AND MEDICAL TREATMENT

Treatment for cyanide poisoning can be provided in two ways, "First Aid" and "Medical Treatment". Both require immediate action to prevent further harm or death. First aid using oxygen and amyl nitrite is generally given by a layman before trained medical help arrives. Medical treatment is aggressive treatment involving intravenous injections of sodium nitrite and sodium thiosulfate, and must be administered by qualified medical personnel. Even if a doctor or nurse is present, the need for fast treatment dictates using first aid treatment with oxygen and amyl nitrite while medical treatment materials for intravenous injection are being prepared. Experience shows that first aid given promptly is usually the only treatment needed for typical accidental poisonings. Larger cyanide intake increases the need for medical treatment.

Degussa Canada Ltd.

MATERIAL SAFETY DATA SHEET

SODIUM CYANIDE

ACUTE OVER EXPOSURE EFFECTS.....	DEATH MAY OCCUR ALMOST IMMEDIATELY DUE TO BREATHING FAILURE OR MAY BE DELAYED SEVERAL HOURS TO SEVERAL DAYS DEPENDING ON EXPOSURE LEVEL.
CHRONIC OVER EXPOSURE EFFECTS...	NOT AVAILABLE
SUBSTANCE DOSE FOR PRODUCT.....	8.35 mg/kg
IRRITANCY OF PRODUCT.....	RESPIRATORY TRACT, GASTROINTESTINAL TRACT.
EXPOSURE LIMITS.....	5 mg/m3, SKIN (CYANIDE)
SENSITIZATION TO MATERIAL.....	NOT AVAILABLE
SYNERGISTIC PRODUCTS.....	NOT AVAILABLE

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT	
GLOVES (SPECIFY).....	RUBBER
RESPIRATORY (SPECIFY).....	DUST RESPIRATOR, IF NECESSARY.
EYE (SPECIFY).....	GOGGLES, SAFETY GLASSES, FACE SHEILD.
FOOTWEAR (SPECIFY).....	NOT SPECIFIED
CLOTHING (SPECIFY).....	IMPERVIOUS PROTECTIVE CLOTHING.
OTHER (SPECIFY).....	SAFETY SHOWERS & EYEBATHS SHOULD BE PROVIDED I WORK AREA. WORK CLOTHING SHOULD BE CHANGED DAILY IF IT IS POSSIBLE THAT CLOTHING BECOMES CONTAMINATED.
SPECIFIC ENGINEERING CONTROLS...	COMPLETE ENCLOSURE OF PROCESS IS RECOMMENDED BECAUSE OF LOW PERMISSIBLE EXPOSURE LEVELS.
LEAK AND SPILL PROCEDURE.....	WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER & COVER: MOVE CONTAINER FROM SPILL AREA. LARGE SPILL: WET DOWN WITH WATER & DIKE FOR LATER DISPOSAL.
WASTE DISPOSAL.....	PRIOR TO IMPLEMENTING LAND DISPOSAL OF WASTE RESIDUE (INCLUDING WASTE SLUDGE) CONSULT WITH ENVIRONMENTAL REGULATORY AGENCIES FOR GUIDANCE ON ACCEPTABLE DISPOSAL PRACTICES.
HANDLING PROCEDURES.....	IN KEEPING WITH GOOD PERSONAL HYGIENE PRACTICES, WASH HANDS THOROUGHLY AFTER HANDLING MATERIAL. AVOID FREQUENT OR PROLONGED SKIN CONTACT. DO NOT BREATHE DUST OR FUMES. MINIMIZE DUST GENERATION DURING HANDLING. EMPTY CONTAINERS MAY CONTAIN PRODUCT RESIDUE. DO NOT PRESSURIZE, CUT, HEAT, OR WELD EMPTY CONTAINERS. DO NOT REUSE EMPTY CONTAINERS WITHOUT COMMERICAL RECONDITIONING. DO NOT EAT, DRINK OR SMOKE WHILE WORKING WITH MATERIAL. KEEP CONTAINERS CLOSED.
STORAGE REQUIREMENTS.....	STORE IN A COOL, WELL VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. DO NOT STORE IN ALUMINUM OR BLACK IRON PLATE RECEPTACLES. ALL CONTAINERS SHOULD BE KEPT COVERED OR IN EXHAUST HOOD WHEN NOT IN USE.

Degussa Canada Ltd.

MATERIAL SAFETY DATA SHEET

SODIUM CYANIDE

SPECIAL SHIPPING INFORMATION.... 1689; 6.1, 9.2; Grp. I (TDG CLASSIFICATION)

FIRST AID MEASURES

SKIN..... IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER; USE SOAP IF AVAILABLE. REMOVE CONTAMINATED CLOTHING, INCLUDING SHOES, AFTER FLUSHING HAS BEGUN. SPEED IN REMOVING MATERIAL FROM SKIN IS OF EXTREME IMPORTANCE.

EYE..... IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. GET PROMPT MEDICAL ATTENTION.

INHALATION..... IN EMERGENCY SITUATIONS USE PROPER RESPIRATORY PROTECTION TO IMMEDIATELY REMOVE THE AFFECTED VICTIM FROM EXPOSURE. ADMINISTER ARTIFICAL RESPIRATION, USING MECHANICAL RESUSCITATORS, IF BREATHING HAS STOPPED. KEEP AT REST. CALL FOR PROMPT MEDICAL ATTENTION.

INGESTION..... IF SWALLOWED DO NOT INDUCE VOMITING. KEEP AT REST. GET PROMPT MEDICAL ATTENTION.

GENERAL ADVICE. THOSE WORKING WITH CYANIDE SALTS SHOULD BE INSTRUCTED THAT CONTACT WITH ACIDS WILL RELEASE HYDROGEN CYANIDE. WHEN THIS IS DETECTED, THE WORK AREA SHOULD BE EVACUATED IMMEDIATELY. PERSONS WHO WORK IN AND AROUND CYANIDE PREPARATIONS SHOULD BE GIVEN SPECIFIC DETAILED INSTRUCTIONS ON MANAGEMENT OF CYANIDE POISONING.

PREPARATION DATE OF MATERIAL SAFETY DATA SHEET

PREPARED BY..... DEGUSSA CANADA
PHONE NUMBER OF PREPARER..... (416) 336-3423
DATE PREPARED..... MARCH 15, 1989 ; REVIEWED MAY 23, 1990

DISCLAIMER

THE DATA CONTAINED HEREIN IS BELIEVED TO BE ACCURATE AND RELIABLE, BUT NO EXPRESSED OR IMPLIED WARRANTY IS MADE WITH REGARD TO THE ACCURACY OF SUCH DATA OR ITS SUITABILITY FOR A GIVEN SITUATION. SUCH DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESCRIBED AND NOT TO SUCH PRODUCT IN COMBINATION WITH ANY OTHER PRODUCT. WE DISCLAIM ALL LIABILITY FOR ANY ACTIONS TAKEN OR FOREGONE ON RELIANCE UPON SUCH DATA. USERS SHOULD MAKE THEIR OWN INVESTIGATION TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

SECTION 3

Latest Revision - November 10, 1995

GASOLINE

3.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

3.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

3.3 INITIAL SPILL RESPONSE

a) Stop the spill if possible.

b) Eliminate all possible sources of ignition, i.e. extinguish cigarettes, shut off motors (from a remote location if surrounded by vapors).

c) Evacuate danger area.

d) Carefully consider the hazards and merits of trying to contain the spill. Contain only if safe to do so, and obvious benefit of containment is apparent, i.e. contain if flowing towards a creek. Otherwise leave gasoline to spread and evaporate. Do not attempt to contain a gasoline spill on water. Allow it to spread and evaporate.

e) Ventilate vapors if spilled in an enclosed area.

3.4 HAZARDS

a) Highly flammable.

b) Forms explosive mixture with air.

c) Easily ignited by flame or spark.

d) Moderately toxic by ingestion; highly toxic if aspirated.

3.5 ACTION FOR FIRE

a) Use CO_2, dry chemical, foam or water spray (fog), although water may spread the fire.

b) Use jet streams to wash away burning gasoline.

c) Use fog streams to protect rescue team and trapped people.

d) Use water to cool surface of tanks.

e) Divert the gasoline to an open area and let it burn off under control.

f) If the fire is put out before all gasoline is consumed, beware of re-ignition.

g) Rubber tires are almost impossible to extinguish after involvement with a fire. Have vehicles with burning tires removed from the danger area.

3.6 RECOVERY

a) Unburned gasoline can be soaked up by sand and peat moss, or by commercial sorbents such as Graboil.

b) If necessary, contaminated soil should be excavated.

c) Gasoline entering the ground can be recovered by digging sumps or trenches and pumping.

3.7 DISPOSAL

a) Evaporation.

b) Incineration under controlled conditions.

3.8 PROPERTIES

a) Chemical composition - mixture of hydrocarbons in the range C4 to C12.

3.9 ENVIRONMENTAL THREATS

a) Moderately toxic to fish and other aquatic organisms.

b) May create unsightly film on water.

3.10 CONTAINERS

To be determined.

3.11 SUPPLIER

See Section D

MATERIAL: CHEVRON UNLEADED GASOLINE MSDS NUMBER: 372
CHEVRON PRODUCT SYSTEM ID: CPS 201110

CHEVRON REGULAR UNLEADED GASOLINE
CHEVRON REGULAR PLUS UNLEADED GASOLINE
CHEVRON SUPREME UNLEADED GASOLINE
CHEVRON SUPREME PLUS UNLEADED GASOLINE

CHEVRON CANADA LIMITED
1500-1050 WEST PENDER STREET
VANCOUVER, B.C. V6E 3T4
PHONE: 604-668-5300

MATERIAL USE: Motor Fuel

HAZARDOUS INGREDIENTS

CONTROLLED PRODUCTS	CONCENTRATION	ID CAS, UN/NA	EXPOSURE LIMITS	LD50 LC50 (species/route
Toluene	10 - 30	108-88-3	100 ppm	Not Applicabl
Xylene	10 - 30	1330-20-7	100 ppm	Not Applicabl
Benzene	1 - 5	71-43-2	1 ppm	Not Applicabl
n-Hexane	1 - 5	110-54-3	50 ppm	Not Applicabl
Cyclohexane	1 - 5	110-82-7	300 ppm	Not Applicabl
Ethylbenzene	1 - 5	100-41-4	100 ppm	Not Applicabl
Naphthalene	1 - 5	91-20-3	10 ppm	Not Applicabl

WHMIS CLASSIFICATION : Class B2,D2A

TDG CLASSIFICATION : Gasoline, Class 3.1, UN 1203, Pkg. Grp. II

TOXICOLOGICAL PROPERTIES OF PRODUCTS - SUMMARY

LD50 (Species & Route)	Irritancy	Exposure Limits
Not Available	Eye Irritant @ 500 ppm Skin Irritant	300 ppm
LC50	Sensitization	Synergistic Materials
Not Available	Not Applicable	Not Applicable

X Carcinogenicity __Reproductive Effect
__Teratogenicity __Mutagenicity

Prepared by: CHEVRON ENVIRONMENTAL HEALTH CENTRE, INC.
P.O. BOX 4054, RICHMOND, CA 94804-0054
EMERGENCY PHONE: 800-457-2022

Revision/Date: Rev. 12, 03/24/90

Emergency Phone Number(800) 457-2022

Material Safety Data Sheet CHEVRON
Material Safety Data Sheet CHEVRON
Material Safety Data Sheet CHEVRON
Material Safety Data Sheet CHEVRON

CHEVRON Unleaded Gasoline

CPS201110

This Material Safety Data Sheet contains environmental, health and toxicology information for your employees. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under SARA Title III and many other laws. If you resell this product, this MSDS must be given to the buyer or the information incorporated in your MSDS. Discard any previous edition of this MSDS.

The Chevron MSDSs have been reformatted and expanded to provide you with useful hazard warnings and health evaluations and to facilitate your compliance with local, State and Federal regulations.

1. PRODUCT IDENTIFICATION

CHEVRON Unleaded Gasoline

DANGER! - HARMFUL OR FATAL IF SWALLOWED
- VAPOR HARMFUL
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- MAY CAUSE EYE AND SKIN IRRITATION
- EXTREMELY FLAMMABLE
- KEEP OUT OF REACH OF CHILDREN

CHEVRON PRODUCT NUMBER(S): CPS201110
PRODUCT INFORMATION: (800)582-3835

Revision Number: 11 Revision Date: 07/03/89 MSDS Number: 000372
NDA - No Data Available NA - Not Applicable

Prepared According to the OSHA Hazard Communication Standard (29 CFR 1910.1200) by the Chevron Environmental Health Center, Inc., P.O. Box 4054, Richmond, CA 94804.

2. FIRST AID

EYE CONTACT:
Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. No additional first aid should be necessary, however, if irritation persists, see a doctor.
SKIN CONTACT:
Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.
INHALATION:
If respiratory irritation or any signs or symptoms as described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital. Note to Physician: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

3. IMMEDIATE HEALTH EFFECTS

EYE CONTACT:
This substance is slightly irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Signs and symptoms may include pain, tears, swelling, redness, and blurred vision. Eye contact with the vapors, fumes, or spray mist from this substance could also cause similar signs and symptoms.
SKIN IRRITATION:
Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material.
DERMAL TOXICITY:
If absorbed through the skin, this substance is considered practically non-toxic to internal organs.
RESPIRATORY/INHALATION:
This substance is slightly toxic to internal organs if inhaled. The degree of injury will depend on the airborne concentration and duration of exposure. The target organ(s) is the nervous system. Inhalation of gasoline vapor at airborne concentrations exceeding 1000 ppm may cause signs and symptoms of central nervous system effects such as headache, dizziness, loss of appetite, weakness and loss of coordination. Vapor concentrations in excess of 5000 ppm may cause loss of consciousness, coma

and death. Brief exposures to high vapor concentrations may also cause pulmonary edema and bronchitis. Intentional exposures to excessively high concentrations (e.g., when used as a drug of abuse) have been reported to result in clinical manifestations that may include convulsions, delirium, and hallucinations. These manifestations are not known to occur following accidental inhalation of gasoline vapor during normal operations.
INGESTION:
This substance is slightly toxic to internal organs if swallowed. The degree of injury will depend on the amount absorbed from the gut. The target organ(s) is the nervous system. Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination. Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

4. PROTECTIVE EQUIPMENT

EYE PROTECTION:
Do not get this material in your eyes. Eye contact can be avoided by wearing chemical goggles.
SKIN PROTECTION:
No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create airborne concentrations which exceed the recommended exposure standards, the use of an approved respirator is required. Refer to the OSHA Benzene Standard to determine what type of respirator is required based on exposure levels.
VENTILATION:
Use this material only in well ventilated areas.

5. FIRE PROTECTION

FLASH POINT: (P-M) < -49F (-45C)
AUTOIGNITION: NDA
FLAMMABILITY: 1.4 - 7.6%
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam and Water Fog.
NFPA RATINGS: Health 1; Flammability 3; Reactivity 0; Special NDA;
HMIS RATINGS: Health 2; Flammability 3; Reactivity 0; Other NDA;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association or, if applicable, the National Paint and Coating Association, and do not necessarily reflect the hazard evaluation of the Chevron Environmental Health Center. Read the entire

document and label before using this product.
FIRE FIGHTING PROCEDURES:
This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire document.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. STORAGE, HANDLING, AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
NDA.
STABILITY:
Stable.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.
INCOMPATIBILITY:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
SPECIAL PRECAUTIONS:
Never siphon gasoline by mouth. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed. DO NOT TRANSFER LIQUID TO AN UNLABELED CONTAINER. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

7. PHYSICAL PROPERTIES

SOLUBILITY: Soluble in hydrocarbons; insoluble in water.
APPEARANCE: Orange to bronze liquid.
BOILING POINT: 25 - 225C (Variable)
MELTING POINT: NA
EVAPORATION: NDA
SPECIFIC GRAVITY: 0.7 - 0.8
VAPOR PRESSURE: 5 - 15PSI (max.) @ 100F (Variable)
PERCENT VOLATILE (VOLUME %): 99+%
VAPOR DENSITY (AIR=1): 3-4

8. SPILL RESPONSE AND DISPOSAL

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300 (24 hour).
SPILL/LEAK PRECAUTIONS:
Certain geographical areas have air pollution restrictions concerning the use of materials in work situations which may release volatile components to the atmosphere. Air pollution regulations should be studied to determine if this material is regulated in the area where it is to be used.

This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.
DISPOSAL METHODS:
Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

9. EXPOSURE STANDARDS, REGULATORY LIMITS AND COMPOSITION

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

The percent compositions are given to allow for the various ranges of the components present in the whole product and may not equal 100%.

PERCENT/CAS#	COMPONENT/REGULATORY LIMITS
100.0 %	CHEVRON Unleaded Gasoline
CONTAINING	
< 1.4 %	ETHYL BENZENE
CAS100414	A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. 100ppm ACGIH TLV 125ppm ACGIH STEL 100ppm OSHA PEL 125ppm OSHA STEL CERCLA 302.4 RQ=1000 POUNDS
< 0.9 %	XYLENE-P

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NDA - No Data Available NA - Not Applicable

CAS106423 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
CERCLA 302.4 RQ=1000 POUNDS

< 4.6 % XYLENE-M
CAS108383 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
100ppm ACGIH TLV
150ppm ACGIH STEL
100ppm OSHA PEL
150ppm OSHA STEL
CERCLA 302.4 RQ=1000 POUNDS

< 6.5 % TOLUENE
CAS108883 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
100ppm ACGIH TLV
150ppm ACGIH STEL
100ppm OSHA PEL
150ppm OSHA STEL
CERCLA 302.4 RQ=1000 POUNDS

< 3.0 % HEXANE-N
CAS110543 50ppm ACGIH TLV
50ppm OSHA PEL

< 2.4 % CYCLOHEXANE
CAS110827 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
300ppm ACGIH TLV
300ppm OSHA PEL
CERCLA 302.4 RQ=1000 POUNDS

< 15.0 % METHYL TERT BUTYL ETHER
CAS1634044 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

< 4.9 % BENZENE
CAS71432 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
10ppm ACGIH TLV
1ppm OSHA PEL
5ppm OSHA STEL
CERCLA 302.4 RQ=1000 POUNDS

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

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NDA - No Data Available NA - Not Applicable

< 2.2 % XYLENE-O
CAS95476 A toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
100ppm ACGIH TLV
150ppm ACGIH STEL
100ppm OSHA PEL
150ppm OSHA STEL
CERCLA 302.4 RQ=1000 POUNDS

100.0 % GASOLINE, A MIXTURE OF AROMATIC AND PARAFFINIC HYDROCARBONS
300ppm ACGIH TLV
500ppm ACGIH STEL
300ppm OSHA PEL
500ppm OSHA STEL

TLV - Threshold Limit Value
STEL - Short-term Exposure Limit
RQ - Reportable Quantity
CC - Chevron Chemical Company
PEL - Permissible Exposure Limit
TPQ - Threshold Planning Quantity
CPS - CUSA Product Code
CAS - Chemical Abstract Service Number

10. REGULATORY INFORMATION

DOT SHIPPING NAME: GASOLINE
DOT HAZARD CLASS: FLAMMABLE LIQUID
DOT IDENTIFICATION NUMBER: UN1203

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects; YES
2. Delayed (Chronic) Health Effects; YES
3. Fire Hazard; YES
4. Sudden Release of Pressure Hazard; NO
5. Reactivity Hazard; NO

WHEN A COMPONENT OF THIS MATERIAL IS SHOWN IN THIS SECTION, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

ETHYLBENZENE	01,02,10,14,15,17,18,26,28,
P-XYLENE(1,4-DIMETHYL BENZENE)	01,02,10,26,28,
M-XYLENE	01,02,10,14,15,17,18,26,28,
TOLUENE	01,02,10,14,15,17,18,26,28,
HEXANE	02,10,14,17,28,
CYCLOHEXANE	01,02,10,14,17,26,28,
T-BUTYL ETHER	01,10,24,26,
BENZENE	01,02,03,04,10,14,17,18,20,28,
O-XYLENE(1,2-DIMETHYL BENZENE)	01,02,10,14,15,17,18,26,28,
GASOLINE (GENERIC)	14,15,17,18,

REGULATORY LISTS:

01=SARA 313 02=MASS RTK 03=NTP Carcinogen
04=CA Prop. 65 05=MI 406 06=IARC Group 1

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NDA - No Data Available NA - Not Applicable

07=IARC Group 2A	08=IARC Group 2B	09=SARA 302/304
10=PA RTK	11=NJ RTK	12=CERCLA 302.4
13=MN RTK	14=ACGIH TLV	15=ACGIH STEL
16=ACGIH Calculated TLV	17=OSHA PEL	18=OSHA STEL
19=Chevron TLV	20=EPA Carcinogen	21=TSCA SECT 4
22=TSCA SECT 5 SNUR	23=TSCA SECT 6 RULE	24=TSCA SECT 12 EXPORT
25=TSCA SECT 8A CAIR	26=TSCA SECT 8D REPORT	27=TSCA SECT 8E
28=Canadian WHMIS		

11. PRODUCT TOXICOLOGY DATA

EYE IRRITATION:
The Draize Eye Irritation Score (range, 0-110) in rabbits is 0.
SKIN IRRITATION:
The Draize Skin Primary Irritation Score (range, 0-8) for a 4-hour exposure (rabbits) is 0.98.
DERMAL TOXICITY:
The dermal LD50 in rabbits is > 5 ml/kg.
RESPIRATORY/INHALATION:
NDA.
INGESTION:
The oral LD50 in rats is 18.75 ml/kg.
ADDITIONAL TOXICOLOGY DATA:
The American Petroleum Institute (API) sponsored a study where laboratory animals were exposed to 67, 292 and 2056 ppm unleaded gasoline vapor six hours/day, five days/week for approximately two years. Each exposure group consisted of 200 rats and 200 mice. During the course of the study, male rats had an increased incidence of kidney damage followed by repair and enlargement of kidney tubules. At the end of the study, a dose-related incidence of microscopic kidney tumors was detected in the male rats; two tumors were found in the low exposure group, and five were found in the high exposure group. Female rats and both male and female mice did not show this type of lesion. It was noted in the study that the animals that were exposed to gasoline vapors lived longer than the control. Thus, the significance of the tumor findings is difficult to evaluate at this time. Additional findings in the API - sponsored study, which were observed only at the highest doses tested (2065 ppm), included (1) failure to gain body weight, (2) increased incidence of hepatocellular carcinomas (liver cancer) in female mice, and (3) lung inflammation in male and female rats. Subsequent testing has shown that 6 to 10-carbon branched-chain isoparaffinic compounds in gasoline may be responsible for the early kidney damage observed in male rats in the API study. Information collected by the API and others indicates that the damage occurs in the male rat only, does not occur in female rats or mice and monkeys of either sex and may not occur in man. Alpha-2-microglobulin (A2uG), a protein found in the male rat only, accumulated in the kidney of male rats given unleaded gasoline by mouth for 9 days. 2,2,4-trimethyl pentane (TMP), an 8-carbon isoparaffinic component of unleaded gasoline, has been shown to cause kidney damage. A metabolite of TMP has been shown to combine with A2uG in the kidney. The relevance of this renal accumulation of A2uG and its binding to TMP in the causation of kidney damage is being studied. How this accumulation and binding of A2uG in

kidney cells and early kidney injury relate to the development of kidney tumors seen in the API study is currently unknown.

12. ADDITIONAL HEALTH DATA

ADDITIONAL HEALTH DATA COMMENT:
This product contains benzene. The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother. However, some evidence of fetal toxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta.

This product contains n-hexane. Prolonged or repeated contact with n-hexane may cause nerve damage characterized by progressive weakness and numbness in the arms and legs, loss of deep tendon reflexes and reduction of motor nerve conduction velocity. Recovery ranges from no recovery to complete recovery depending upon the severity of the nerve damage.

This product contains toluene. Toluene has been reported to decrease immunological responses in test animals. It has also been reported that when young rats were exposed to 1000 ppm toluene for 14 hours daily, for two weeks, irreversible hearing loss was detected. The same daily exposure to 700 ppm for as long as 16 weeks was without effect. Since the level necessary to produce hearing loss is greater than 7 times the 1987-88 ACGIH TLV for toluene, worker exposures at or below 100 ppm is not expected to cause any adverse effect. There are also reports that chronic abusers (glue sniffers, solvent huffers) of solvents containing toluene have suffered liver, kidney and brain damage. Scientific studies on toluene have failed to demonstrate birth defects in rats and mice. However, toluene has been shown to cause delayed growth and extra ribs in the offspring of rats and mice at inhaled doses (266-399 ppm) that were non-toxic to the mother. Toluene has not conclusively been shown to cause adverse reproductive effects in humans.

This product contains xylene which has been reported to be embryotoxic and to cause developmental disturbances in rats and mice exposed before birth. Xylene has given negative results in several mutagen testing assays including the Ames assay. In a cancer study sponsored by the National Toxicology Program (NTP), technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years.

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Revision Number: 11 Revision Date: 07/03/89 MSDS Number: 000372
NDA - No Data Available NA - Not Applicable

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Revision Number: 11 Revision Date: 07/03/89 MSDS Number: 000372
NDA - No Data Available NA - Not Applicable

MATERIAL SAFETY DATA SHEET

N/AP = Not Applicable
N/AV = Not Available

UNLEADED GASOLINE SECTION 3

SECTION 1—PRODUCT IDENTIFICATION AND USE

MSDS 372

PRODUCT IDENTIFIER	PRODUCT IDENTIFICATION NUMBER (PIN)
Chevron Unleaded Gasolines	UN 1203

PRODUCT USE: Fuel

SUPPLIER'S NAME	MANUFACTURER'S NAME
Chevron Canada Limited	Chevron Canada Limited
STREET ADDRESS: 1500 - 1050 West Pender Street	STREET ADDRESS: 1500 - 1050 West Pender Street
CITY: Vancouver; PROVINCE: B.C.	CITY: Vancouver; PROVINCE: B.C.
POSTAL CODE: V6E 3T4; EMERGENCY TELEPHONE NO.: 1-800-457-2022	POSTAL CODE: V6E 3T4; EMERGENCY TELEPHONE NO.: 1-800-457-2022

SECTION 2—HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS NUMBER	LD_{50} OF INGREDIENT (SPECIFY SPECIES AND ROUTE)	LC_{50} OF INGREDIENT (SPECIFY SPECIES)
Ethylbenzene	0 - 1.4	100414	3 500 mg/kg, rat, oral 17 800 mg/kg, rabbit, skin	N/AV
Xylene-P	0 - 0.9	106423	5 mg/kg, rat, oral	4 500 ppm/4H, rat, inhalation
Xylene-M	0 - 4.6	108383	5 gm/kg, rat, oral 14 100 mg/kg, rabbit, skin	
Xylene-O	0 - 2.2	95476	1 364 mg/kg, mouse, intraperitoneal	N/AV
Toluene	0 - 6.5	108883	5 000 mg/kg, rat, oral 12 124 mg/kg, rabbit, skin	N/AV
Hexane	0 - 3.0	110543	28 710 mg/kg, rat, oral	N/AV
Cyclohexane	0 - 2.4	110827	N/AV	N/AV
Methyl Tertiary Butyl Ether (Supreme grades only)	0 - 15.0	1634044	2.8 g/kg, rat, oral >10.2 g/kg, rabbit, dermal	23 546 ppm/4H, rat, inhalation
Benzene	0 - 4.9	71432	3 306 mg/kg, rat, oral	10 000 ppm/7H, rat, inhalation

SECTION 3—PHYSICAL DATA

PHYSICAL STATE	ODOUR AND APPEARANCE			ODOUR THRESHOLD (ppm)
Liquid	orange to bronze liquid with a solvent odour			N/AV
VAPOUR PRESSURE (mm Hg)	VAPOUR DENSITY (AIR=1)	EVAPORATION RATE	BOILING POINT (°C)	FREEZING POINT (°C)
5-15 psi (min.) @ 100°F (variable)	3 - 4	N/AV	25 - 225°C (variable)	N/AV
pH	SPECIFIC GRAVITY	COEFF. WATER/OIL DIST.		
N/AV	0.7 - 0.8	N/AV		

SECTION 4—FIRE AND EXPLOSION DATA

FLAMMABILITY YES ☒ NO ☐ IF YES, UNDER WHICH CONDITIONS? Extremely flammable—this product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapour (fumes) that can catch fire and burn with explosive violence. Invisible vapour spreads easily and can be set on fire by many sources such as pilot lights, welding equipment and electrical motors and switches.

MEANS OF EXTINCTION: Fire fighting foam: Alcohol-resistant type (AR) AFFF, CO_2, dry chemical.

FLASH POINT (°C) AND METHOD	UPPER FLAMMABLE LIMIT (% BY VOLUME)	LOWER FLAMMABLE LIMIT (% BY VOLUME)
-45°C (P-M)	7.6	1.4
AUTOIGNITION TEMPERATURE (°C): N/AV	HAZARDOUS COMBUSTION PRODUCTS: Carbon Monoxide	
EXPLOSION DATA: SENSITIVITY TO IMPACT: N/AV	SENSITIVITY TO STATIC DISCHARGE: N/AV	

SECTION 5—REACTIVITY DATA

CHEMICAL STABILITY YES ☒ NO ☐ IF NO, UNDER WHICH CONDITIONS?

INCOMPATIBILITY WITH OTHER SUBSTANCES YES ☒ NO ☐ IF SO, WHICH ONES? May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

REACTIVITY, AND UNDER WHAT CONDITIONS: N/AV

HAZARDOUS DECOMPOSITION PRODUCTS: N/AV

SECTION 6—TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY: SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INHALATION ☒ INGESTION ☒

EFFECTS OF ACUTE EXPOSURE TO PRODUCT: This substance is slightly irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Signs and symptoms may include pain, tears, swelling, redness and blurred vision. Eye contact with the vapours, fumes, or spray mist from this substance could also cause similar signs and symptoms. If absorbed through the skin, this substance is considered practically nontoxic to internal organs. This substance is slightly toxic to internal organs if inhaled. The degree of injury will depend on the airborne concentration and duration of exposure. The target organ is the nervous system. Inhalation of gasoline vapour at airborne concentrations exceeding 1000 ppm may cause signs and symptoms of central nervous system effects such as headache, dizziness, loss of appetite, weakness and lost of coordination. Vapour concentrations in excess of 5000 ppm may cause loss of consciousness, coma and death. Brief exposures to high vapour concentrations may also cause pulmonary edema and bronchitis. These manifestations are not known to occur following accidental inhalation of gasoline vapour during normal operations. This substance is slightly toxic to internal organs if swallowed. The degree of injury will depend on the amount absorbed from the gut. The target organ is the nervous system. Signs and symptoms of central nervous system effects may include one or more of the following: headache, dizziness, loss of appetite, weakness and loss of coordination. Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT:

Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material. Intentional exposures to excessively high concentrations (e.g., when used as a drug of abuse) have been reported to result in clinical manifestations that may include convulsions, delirium and hallucinations.

Also, see Section 9.

EXPOSURE LIMITS: ACGIH; Gasoline—300 ppm TWA, 500 ppm STEL; Ethylbenzene—100 ppm TWA, 125 ppm STEL; Xylene and Toluene—100 ppm TWA, 150 ppm STEL; Hexane—60 ppm TWA, 1000 ppm STEL; Cyclohexane—300 ppm TWA; Benzene—10 ppm TWA	TERATOGENICITY: See Section 9
IRRITANCY OF PRODUCT: Yes. See Effects of Acute Exposure to Product	REPRODUCTIVE TOXICITY: See Section 9
SENSITIZATION TO PRODUCT: */AV	MUTAGENICITY: See Section 9
CARCINOGENICITY: See Section 9	SYNERGISTIC PRODUCTS: N/AV

mkn/55.2

PRODUCT IDENTIFIER Chevron Unleaded Gasolines

SECTION 7—PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

GLOVES (SPECIFY)

Nitrile, PVA, Viton (if using PVA gloves, avoid contact with water; PVA gloves deteriorate in water).

RESPIRATOR (SPECIFY)

No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations that exceed the recommended exposure standards, the use of an approved respirator is recommended.

EYE (SPECIFY)

Chemical Goggles

FOOTWEAR (SPECIFY)

N/AV

CLOTHING (SPECIFY)

Protective Clothing

OTHER (SPECIFY)

N/AV

ENGINEERING CONTROLS (SPECIFY, E.G. VENTILATION, ENCLOSED PROCESS)

Use this material only in well ventilated areas.

LEAK AND SPILL PROCEDURE Eliminate all sources of ignition in vicinity of spill or released vapour. Clean up spills immediately, observing precautions in Section 7 - Preventive Measures. This material is considered to be a water pollutant, and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

WASTE DISPOSAL

Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

HANDLING PROCEDURES AND EQUIPMENT Never siphon gasoline by mouth. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel or any other such use. DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapour or liquid. DO NOT TRANSFER LIQUID TO AN UNLABELLED CONTAINER.

STORAGE REQUIREMENTS

DO NOT STORE near flame, sparks or hot surfaces.

SPECIAL SHIPPING INFORMATION

N/AV

mk6/55.3

SECTION 8—FIRST AID MEASURES

SPECIFIC MEASURES

Eye Contact: Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. No additional first aid procedures should be necessary. However, if irritation persists, see a doctor.

Skin Contact: No first aid procedures are required. As a precaution, wash skin thoroughly with soap and water. Remove and wash contaminated clothing.

Inhalation: If respiratory irritation or any signs or symptoms described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor.

Ingestion: If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment centre or hospital. Note to Physician: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid, which can cause pneumonitis.

This product contains benzene. Repeated or prolonged breathing of benzene vapours has been associated with the development of chromosomal damage experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother. However, some evidence of fetal toxicity as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate, but it has been established that benzene can cross the human placenta.

This product contains n-hexane. Prolonged or repeated skin contact or breathing of vapours may cause nerve damage characterized by progressive weakness and numbness in the arms and legs. Recovery ranges from no recovery to complete recovery, depending upon the severity of the nerve damage.

This product contains toluene. Toluene has been reported to decrease immunological responses in test animals. It has also been reported that when young rats were exposed to 1000 ppm toluene for 14 hours daily, for two weeks, irreversible hearing loss was detected. The same daily exposure to 700 ppm for as long as 16 weeks was without effect. Since the level necessary to produce hearing loss is greater than 7 times the ACGIH TLV-TWA for toluene, worker exposure at or below 100 ppm is not expected to cause any adverse effects. There are also reports that chronic solvent abusers (glue sniffers, solvent huffers) who deliberately inhale high concentrations (several thousand ppm) of toluene for prolonged periods (up to ten hours/day) have suffered liver, kidney and brain damage. Toluene may also cause mental and/or growth retardation in the children of female solvent abusers who directly inhale toluene when they are pregnant. Toluene caused growth retardation in rats when administered at doses that were toxic to the mothers (1500 ppm). Concentrations of up to 5000 ppm did not cause birth defects. There were no effects in the offspring at doses that did not intoxicate the pregnant rats. The exposure level at which no effects were seen is 750 ppm. We recommend that the precautions outlined in this MSDS be followed to keep toluene concentrations below the recommended exposure standards.

This product contains xylene, a chemical that has been reported to cause developmental toxicity in rats and mice exposed by inhalation during pregnancy. The effects noted consisted of delayed development and minor skeletal variations; additionally, when pregnant mice were exposed by ingestion to a level that killed nearly one-third of the test group, lethality (resorptions) and malformations (primarily cleft palate) occurred. Malformations have not been reported following inhalation exposure. Because of the very high levels of exposure used in these studies, we do not believe that their results imply an increase risk of reproductive toxicity to workers exposed to xylene levels at or below the exposure standard. Xylene has given negative results in several mutagen testing assays, including the Ames assay. In a cancer study sponsored by the National Toxicology Program (NTP), technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years.

This product contains methyl tertiary butyl ether (MTBE). Most mutagenicity data on MTBE, except for the in vitro mouse lymphoma test, indicate that it is not mutagenic. MTBE caused birth defects in mice exposed to 8000 ppm throughout pregnancy. No birth defects were observed in mice at 1000 ppm or in rats or rabbits at any dose of MTBE. These results suggest that the risk of birth defects in humans from MTBE is negligible at the anticipated exposure concentrations.

Whole gasoline exhaust was reviewed by the International Agency for Research on Cancer (IARC) in their Monograph Volume 46 (1989). Evidence for causing cancer was considered inadequate in animals and inadequate in humans. IARC placed whole gasoline exhaust in Category 2B, considering it possibly carcinogenic to humans.

Product Toxicology Data: The Draize Eye Irritation Score (range 0-110) in rabbits is 0. The Draize Skin Primary Irritation Score (0-8) for a 4-hour exposure (rabbits) is 0.98. This material was not a skin sensitizer in the modified Buehler Guinea Pig Sensitization Tests. The dermal LD50 in rabbits is >5 ml/kg. The oral LD50 in rats is >5 ml/kg. Lifetime inhalation of whole gasoline vapour has caused increased liver tumors in female mice. The mechanism of this response is still being investigated, but it is thought to be an epigenetic process unique to the female mouse. Inhalation exposure to whole gasoline vapour ~~also caused kidney damage and eventually kidney cancer in male rats. No other animal model studied has shown these adverse kidney effects, and there is~~ no physiological reason to believe that they would occur in man.

PREPARATION DATE OF MSDS

PREPARED BY (GROUP, DEPARTMENT, ETC.)	PHONE NUMBER	DATE
Chevron Canada Limited	(604) 668-5554	April 24, 1992

SECTION 4

Latest Revision - November 10, 1995

SULFUR DIOXIDE

4.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

4.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

4.3 INITIAL SPILL RESPONSE

a) Use personal protective gear (approved respirator) and turn off valving if possible.

b) If leak is considerable, self-contained breathing apparatus must be used.

c) Evacuate others from area.

d) Protect immediate area by roping off and posting appropriate signs.

4.4 HAZARDS

a) Toxic and highly irritating fume.

b) Not flammable.

c) Extremely heavy (density 2.25) and will seek low areas.

d) Contact with liquid will cause frost burns.

4.5 ACTION FOR FIRE

a) Not flammable.

b) If present during a fire, water fog, carbon dioxide or dry chemical may be used.

c) Remain upwind.

4.6 RECOVERY

In the event of a leak of liquid SO2, the liquid rapidly converts to gaseous SO2. Recovery of the liquid or gaseous form is not viable.

Spill response techniques to isolate or cap the leak, in addition to keeping the storage tank cool in the event of a fire, could be effective in minimizing potential losses.

4.7 DISPOSAL

a) Liquid sulfur dioxide can be absorbed in solutions of sodium or calcium hydroxides.

b) Water fog will disperse but forms corrosive liquid.

4.8 PROPERTIES

a) Extremely irritating to nose and throat.

b) Pulmonary edema results from prolonged exposure and symptoms may be delayed.

4.9 CONTAINERS

a) Liquid sulfur dioxide is shipped to site in pressurized (40-60 psi) tanker trucks and is stored in a permanent tank at the sulfur dioxide plant.

4.10 ENVIRONMENTAL THREAT

SO_2 gas is toxic and highly irritating. In the event of a major incident evacuation procedures may be implemented, including an interruption of traffic on the public access road.

4.11 SUPPLIER

a) Cominco, Trail, BC

b) Hauled by Trimac (see Section B)

SULFUR DIOXIDE

UN1079

Characteristics

a) Shipped as a liquid under pressure (40-60 psi).

b) Non-flammable compressed gas.

c) Clear water to yellowish liquid with very strong irritating odor.

d) Two and a quarter (2-1/4) times heavier than air. Seeks low spaces. Not easily dissipated. Use fine water spray.

e) Does not burn nor support combustion.

f) Contact will cause burns to eyes or skin due to freezing effect.

g)

TLV	2 ppm
Irritation to throat and eyes	8-12 ppm
Coughing	20 ppm
Maximum allowable for short exposure	50 ppm

h) Extremely irritating to nose and throat due to formation of sulfurous acid as the gas comes in contact with moisture on these surfaces. Pulmonary edema.

i) High concentrations make it impossible to stay in the area unless trapped. Cases of severe exposure not numerous.

FIRST AID TREATMENT

Contact with Liquid

- Flush thoroughly with water for 20 minutes.
- Cover burn area.
- Treat as for heat burn.

Contact with Gas

- Remove to area free of fumes.
- Reclining position, head and shoulders raised.
- Oxygen therapy.
- Treat as a stretcher patient.
- Treat for shock - warm and at rest.
- Be alert to the fact that symptoms may be delayed.
- Medical aid.

Personal protective gear must be worn when loading or unloading into storage tanks or whenever there is a possibility of contact.

Rubber rain gear, eye and face protection, rubber gloves and a respirator must be available for instant use.

SENT BY:COMINCO FERTILIZERS :12-19-91 :11:57AM : 403 2595029→ 604 292 8266:# 2/ 3

Cominco Fertilizers
A Division of Cominco Ltd.

SULPHUR DIOXIDE
PIN - U.N. 1079
C.A.S. - 7446-09-5
WHMIS - A, D-1, E

Material Safety Data Sheet

SECTION I MATERIAL IDENTIFICATION AND USE

Manufacturer's Name: COMINCO FERTILIZERS - A DIV. OF COMINCO LTD.	Supplier's Name:
Street Address: 426 - 10333 SOUTHPORT RD. S.W.	Street Address:
City: CALGARY; Province: ALBERTA	City: ; Province:
Postal Code: T2W 3X6; Emergency Telephone No.: 604-364-4214	Postal Code: ; Emergency Telephone No.:
Chemical Name: SULPHUR DIOXIDE; Chemical Formula: SO_2; Molecular Weight: 64.06	
Trade Name and Synonyms: SULPHUROUS ACID	Material Use: PULP & PAPER INDUSTRY, FOOD PROCESSING, CHEMICAL INDUSTRY

SECTION II HAZARDOUS INGREDIENTS OF MATERIAL

Hazardous Ingredients	Approximate Concentration %	C.A.S.	"Exposure limits"	LD_{50}/LC_{50} Specify Species and Route
SULPHUR DIOXIDE	100	7446-09-5	TLV - 2 P.P.M. (ACGIH)	LC_{50} 250 P.P.M. (RAT - INHAL.)

SECTION III PHYSICAL DATA FOR MATERIAL

Physical State: Gas ☐ Liquid ☒ Solid ☐	Odour and Appearance: IRRITATING ODOUR, IS LIQUID AT - 10°C & 1 ATM.		Odour Threshold (p.p.m.): 3	Specific Gravity: 2.2(GAS) 1.45 @ -10°C (LIQUID)
Vapour Pressure (mm): 2500 @ 20°C	Vapour Density (Air=1): 2.26 @ 20°C	Evaporation Rate: NOT APPLICABLE	Boiling Point (°C): -10	Freezing Point (°C): -75.5
Solubility in Water (20°C): 10.2 G/100 ML	pH: NOT APPLICABLE	Density (g/ml): 1.45 @ -10°C	Coefficient of water/oil distribution: NO DATA	

SECTION IV FIRE AND EXPLOSION HAZARD OF MATERIAL

Flammability: Yes ☐ No ☒ — If yes, under which conditions?

Means of Extinction:
SULPHUR DIOXIDE IS NOT FLAMMABLE. WHERE FIRE IS INVOLVED USE ANY FIRE FIGHTING AGENT APPROPRIATE FOR SURROUNDING MATERIAL. USE WATER SPRAY TO COOL FIRE EXPOSED AREAS.

Special Procedures:
FIREFIGHTERS MUST USE A SELF-CONTAINED BREATHING APPARATUS & FULL PROTECTIVE CLOTHING. STOP ANY SO_2 FLOW AND MOVE CONTAINERS AWAY FROM FIRE AREA IMMEDIATELY. IF THIS CANNOT BE DONE, KEEP SO_2 CONTAINERS COOL WITH WATER SINCE PRESSURE WILL INCREASE RAPIDLY WITH TEMPERATURE INCREASE. NEVER APPLY WATER TO A SULPHUR DIOXIDE LEAK. APPLICATION OF WATER MAKES SULPHUR DIOXIDE MUCH MORE CORROSIVE. CONTAIN SPILLED MATERIAL TO PREVENT IT FROM ENTERING WATER STREAMS OR SEWERS.

Flashpoint (°C) and Method: NOT FLAMMABLE	Upper explosion limit (% by volume): NOT APPLICABLE	Lower explosion limit (% by volume): NOT APPLICABLE
Auto Ignition Temperature (°C): NOT FLAMMABLE		Hazardous Combustion Products: NOT APPLICABLE
Sensitivity to Mechanical Impact: NONE		Sensitivity to Static Discharge: NO

SECTION V REACTIVITY DATA

Chemical Stability: Yes ☒ No ☐ — If no, under which conditions?

Incompatibility with other substances: Yes ☒ No ☐ — If so, which ones? STRONG ALKALIS, OXIDISING AGENTS, POWDERED POTASSIUM & SODIUM

Reactivity and under what conditions:
CORRODES MOST METALS IN PRESENCE OF MOISTURE. REACTS WITH WATER & STEAM.

Hazardous Decomposition Products:
FORMS SULPHUROUS ACID IN CONTACT WITH WATER OR STEAM.

SENT BY:COMINCO FERTILIZERS ;12-19-91 ;11:56AM ; 403 2595029- 604 292 8266:# 3/ 3

SECTION VI TOXICOLOGICAL PROPERTIES OF PRODUCT

Route of Entry: ☒ Skin Contact ☐ Skin Absorption ☒ Eye Contact ☒ Inhalation Acute ☒ Inhalation Chronic ☐ Ingestion

Effects of Acute Exposure to Product

Skin: CONTACT WITH LIQUID SULPHUR DIOXIDE CAN CAUSE SKIN BURNS

Eye: CONCENTRATIONS ABOVE 20 P.P.M. CAUSE LACRIMATION (TEARING) & IRRITATION OF EYES

Inhalation: CONCENTRATIONS ABOVE 6 P.P.M. PRODUCES IMMEDIATE IRRITATION OF NOSE & THROAT

Ingestion: IS A GAS, INGESTION IS NOT LIKELY

Effects of Chronic Exposure to Product: RHINITIS, DRYNESS OF THROAT & COUGH

LD_{50} of Product (Specify Species and Route)	Irritancy of Product	Exposure limits of Product
	VERY IRRITATING TO RESPIRATORY TRACT & EYES	2 P.P.M./5 MG/M³ (ACGIH)
LC_{50} of Product (Specify Species)	Sensitization of Product	Synergistic materials
	NOT KNOWN	WATER

☐ Carcinogenicity ☐ Reproductive effects ☐ Teratogenicity ☐ Mutagenicity

NO DATA

SECTION VII PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

Gloves (Specify)	Respiratory (Specify)	Eye (Specify)	Footwear (Specify)
RUBBER OR VINYL	CHEMICAL CART. BELOW 20 P.P.M.	GOGGLES OR FACE SHIELD, DON'T WEAR CONTACT LENSES	RUBBER BOOTS FOR LIQUID
Clothing (Specify)	Other (Specify)		
RUBBER CLOTHING FOR LIQUID			

Engineering Controls (e.g. ventilation, enclosed process, specify)

LOCAL OR GENERAL VENTILATION TO CONTROL AMBIENT LEVELS BELOW THE EXPOSURE LIMIT

Leak and Spill Procedure

LOCATE & CONTROL LEAKAGE BY CLOSING OR CAPPING VALVES. LIQUID SULPHUR DIOXIDE CAN BE ABSORBED IN SOLUTIONS OF SODIUM OR CALCIUM HYDROXIDES.

Waste Disposal

ABSORBED SULPHUR DIOXIDE SOLUTIONS MUST BE OXIDIZED TO INERT SULPHATE SALTS & THEN DISPOSED OF ONLY IN ACCORDANCE WITH APPLICABLE REGULATIONS.

Handling Procedures and Equipment

ONLY TRAINED PERSONNEL SHOULD HANDLE SULPHUR DIOXIDE. FULL PROTECTIVE EQUIPMENT SHOULD BE USED.

Storage Requirements

STORE CONTAINERS IN COOL, DRY, VENTILATED AREA. PROTECT AGAINST PHYSICAL DAMAGE.

Special Shipping Information

T.D.G. - 2.3 P.G. II POISONOUS GAS

SECTION VIII FIRST AID MEASURES

Skin

REMOVE CONTAMINATED CLOTHING UNDER SHOWER. CONTINUE FLUSHING WITH WATER. SEEK MEDICAL ATTENTION IMMEDIATELY.

Eye

FLUSH EYES FOR AT LEAST 20 MINUTES INCLUDING UNDER EYELIDS. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION IMMEDIATELY.

Inhalation

REMOVE VICTIM TO FRESH AIR AND SUPPORT BREATHING. USE MEDICAL OXYGEN IF AVAILABLE. IF BREATHING HAS STOPPED, USE RESCUE BREATHING. IF HEART BEAT IS ABSENT, COMMENCE CARDIOPULMONARY RESUSCITATION. SEEK MEDICAL ATTENTION IMMEDIATELY.

Ingestion

IF VICTIM IS CONSCIOUS AND CAN SWALLOW, GIVE TWO GLASSES OF WATER. DO NOT INDUCE VOMITING. SEEK MEDICAL ATTENTION IMMEDIATELY.

The data presented herein is believed accurate for the specific material but is in no way guaranteed. The information herein may not be applicable if the specific material is used in combination with other materials. Cominco Fertilizers assumes no liability and makes no warranty in connection with any use of the specific material. Other or additional safety measures to those indicated may be required. The user, therefore, assumes full responsibility, both as to persons and as to property, for the use of these materials.

SECTION IX PREPARATION DATE OF M.S.D.S.

Additional Information/Comments/References

CHEMINFO DATA SHEETS. COMINCO LTD. PRODUCT DATA SHEETS.

Prepared by:	Phone number	Date
COMINCO FERTILIZERS A DIV. OF COMINCO LTD.	403-258-4600	JUNE, 1991

SECTION 5

Latest Revision - November 10, 1995

Copper Sulfate

5.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

5.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

5.3 INITIAL SPILL RESPONSE

a. Stop the spill at source, if possible.

b. Shovel dry solids into a container and dispose of material in the tailings pond.

c. Neutralize wet spill with lime.

d. Do not allow spill to enter waterways.

5.4 HAZARDS

a. Repeated contact may cause skin irritation and ulceration of the nose and throat.

b. Highly corrosive.

c. Lethal to aquatic life.

5.5 ACTION FOR FIRE

a. Not flammable.

b. If present during a fire, water fog, carbon dioxide or dry chemical may be used.

c. Remain upwind.

d. Use protective clothing and breathing apparatus.

5.6 RECOVERY

Dispose of all residues, dry solids or neutralized material to the tailings impoundment area; submerge in water.

5.7 DISPOSAL

a. Re-use if possible.

b. Bury in chemical landfill site.

5.8 PROPERTIES

a. Light blue crystals.

b. Skin/eye/respiratory tract irritant.

c. Dermatitis, skin discoloration, liver damage are the effects of chronic exposure to product.

5.9 ENVIRONMENTAL THREAT

a. Could put aquatic life at severe risk if allowed to enter any watercourse.

b. Cupric ion concentrations are lethal to fish at very low levels.

c. Very soluble in water.

5.10 CONTAINERS

a. 1,000 kg bags

b. 500 kg bags

c. 25 kg bags

5.11 SUPPLIER

a. Cominco Ltd., Trail, B.C.

b. Van Waters

P1352 MATERIAL SAFETY DATA SHEET PAGE 1

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

SALES ORDER:

VAN WATERS & ROGERS PRODUCT: 19816

MSDS NUMBER: P1352 VERSION: 3

DATE PRINTED: 16/12/91

INTERNATIONAL CORONA CORPN
ATTN; CAROL GIVEN\
P.O. BOX 788
PENTICTON BC V2A 6Y7

WHMIS CODES: D.1B

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: COPPER SULFATE PENTAHYDRATE CAS NO.: 7758-99-8
COMMON NAMES/SYNONYMS: BLUE VITRIOL; COPPER SULFATE PENTAHYDRATE; CUPRIC SULFATE PENTAHYDRATE VW&R CODE: P1352

FORMULA: CU S 04 . 5 H2 0
HAZARD RATING (NFPA 704)
HEALTH: 3
FIRE: 0
REACTIVITY: 0
SPECIAL: NONE

DATE ISSUED: 07/89
SUPERCEDES: 08/86
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

HAZARDOUS INGREDIENTS

COMPONENT	%	EXPOSURE LIMITS, MG/M3 OSHA PEL	ACGIH TLV	OTHER LIMIT	HAZARD
COPPER SULFATE PENTAHYDRATE	>99	1 (CU)	NONE	NONE	TOXIC; CORROSIVE

MAY CONTAIN IRON, ZINC, AND OTHER TRACE METAL AND MINERAL IMPURITIES

PHYSICAL PROPERTIES

BOILING POINT, DEG F: 1,207(DEC) VAPOR PRESSURE, MM HG/20 DEG C: NOT APPLICABLE
MELTING POINT, DEG F: 302(DEHYDRATES) VAPOR DENSITY (AIR=1): NOT APPLICABLE
SPECIFIC GRAVITY (WATER=1): 2.28 WATER SOLUBILITY, %: 30
APPEARANCE AND ODOR: BLUE CRYSTALLINE POWDER OR CRYSTALS; ODORLESS. EVAPORATION RATE (BUTYL ACETATE=1): NOT APPLICABLE

FIRST AID MEASURES

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

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.

IN CASE OF SKIN CONTACT: IMMEDIATELY FLUSH SKIN WITH LOTS OF RUNNING

WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET IMMEDIATE MEDICAL ATTENTION.

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING LARGE QUANTITIES OF MILK OR EGG WHITES, OR IF NOT AVAILABLE, WATER, AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

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

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE
INHALATION: BREATHING DUST OR MISTS MAY IRRITATE THE NOSE, THROAT AND MUCOUS MEMBRANES OF THE RESPIRATORY TRACT AND CAUSE COUGHING AND CHEST DISCOMFORT.

EYE CONTACT: LIQUID AND MISTS MAY SEVERELY IRRITATE OR DAMAGE THE EYES.

SKIN CONTACT: CONTACT WITH THE DUST OR SOLUTIONS MAY IRRITATE THE SKIN.

SWALLOWED: INGESTION OF A LARGE QUANTITY OF COPPER SULFATE HAS CAUSED VOMITING, GASTRIC PAIN, DIZZINESS, EXHAUSTION, ANEMIA, CRAMPS, CONVULSIONS, SHOCK, COMA AND DEATH.

CHRONIC EFFECTS OF EXPOSURE: DAMAGE TO THE NERVOUS SYSTEM AND KIDNEY HAVE BEEN RECORDED, JAUNDICE AND LIVER ENLARGEMENT HAVE ALSO BEEN OBSERVED.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

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

ORAL: HUMAN LDLO = 1,088 MG/KG (HYDRATE); HUMAN LDLO = 50 MG/KG (ANHYDROUS); RAT LD50 = 300 MG/KG (ANHYDROUS & HYDRATE)

DERMAL: NO DATA FOUND

INHALATION: NO DATA FOUND

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: THERE HAS BEEN REPORTED AN EXCESS OF CANCER CASES IN THE COPPER SMELTING INDUSTRY.

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

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAINTAINING DUST EMISSIONS AT THE POINT OF USE BELOW THE PEL.

RESPIRATORY PROTECTION: WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THE DUST CONCENTRATION AT THE POINT OF USE. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR WITH PARTICULATE FILTERS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. 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, SAFETY SHOES, RUBBER GLOVES, AND RUBBER 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
METHOD USED: NOT APPLICABLE

FLAMMABLE LIMITS IN AIR, %
LOWER: NOT UPPER: NOT

APPLICABLE APPLICABLE
EXTINGUISHING MEDIA: THIS MATERIAL IS NOT COMBUSTIBLE. USE ANY APPROPRIATE MEDIUM FOR EXTINGUISHING SURROUNDING FIRE.

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----------

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: HIGH TEMPPERATURES.

MATERIALS TO AVOID: HYDROXYLAMINE.

HAZARDOUS DECOMPOSITION PRODUCTS: WILL LIBERATE TOXIC FUMES OF SULFUR OXIDES.

----------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 WITH PARTICULATE FILTERS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS, SWEEP UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, SHOVEL INTO DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL.
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, CASES 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 AWAY FROM INCOMPATIBLE MATERIALS. KEEP BAGS OR FIBER DRUMS DRY AT ALL TIMES. 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. 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, EASTERN TIME (416)-741-9190.

----------NOTICE----------

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

----------REVISION----------

08/86: CORRECTED PRODUCT NAME AND CAS NUMBER. REVISED VENTILATION, RESPIRATORY, AND EYE PROTECTION, FIRE FIGHTING INFORMATION, SPILL AND LEAK PROCEDURES, AND HANDLING ADVICE.

07/89: REVIEWED IN ACCORDANCE WITH WHMIS REGULATIONS.
NO CHANGE OF INFORMATION.

P1352 MATERIAL SAFETY DATA SHEET PAGE 4

END OF MSDS

COPPER SULFATE

SECTION 1

)PPER SULPHATE

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

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

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

roduct Name: COPPER SULPHATE VW&R Code: L1274

Common Name/Synonym: Copper (II) Sulphate, Blue stone.
AS Registry Number: 7758-98-7
hemical Name: Copper Sulphate
hemical Family: N/D
Formula: CuSO4
olecular Weight: 249.7
roduct Use: N/D

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

ate Issued: 11/92
upercedes: 07/89 (P1352)
Prepared By: MSDS Coordinator. Contact during business hours,
astern Time (416) 736-9299.

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

omponent(s)/CAS No.	% wt.	Exposure Limits, mg/m3 OSHA PEL	ACGIH TLV
opper Sulphate 7758-98-7)	64	1.0*	1.0*

*as Cu

Local regulated limits may vary.

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

oiling Point: N/AP
Melting Point: N/D
reezing Point: N/AP
pecific Gravity (Water=1): 2.29
apour Pressure: N/D
Vapour Density: N/D
H: N/D
olubility in Water (20 C): (50 grams)
ensity (g/ml): Bulk density - 1.26
% Volatile: N/D
poration Rate (Butyl Acetate=1): N/D
r Threshold: None
oefficient of Water/Oil Distribution: N/D
pearance and Odour: No odour; white to blue granular or crystal.

hysical State: Solid

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

lash Point/Method: Non-combustible
ower Flammable Limit: N/AP
Upper Flammable Limit: N/AP
Autoignition Temperature: N/D

xtinguishing Media: Where fire is involved use any fire fighting agent appropriate for surrounding material. Use water spray to cool fire exposed areas. Avoid using a direct stream of water on molten cupric sulphate.

pecial Fire Fighting Procedures: Fire fighters should use self contained breathing apparatus and protective clothing. Contain spilled material to prevent it from entering water streams or sewers.

nusual Fire and Explosion Hazards: N/D

Hazardous Combustion Products: Toxic fumes of SOx above 400 C.

xplosion Data
Sensitivity to Mechanical Impact: No
Sensitivity to Static Discharge: N/AP

.. ditions of Flammability: Not flammable.

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

stability: Stable.
Hazardous Polymerization: N/D
onditions to Avoid: N/D
aterials to Avoid: Solution can react with magnesium to evolve hydrogen. Contact with hydroxylamine will ignite hydroxylamine.
Hazardous Decomposition Products: Copper oxides and sulphur compounds and temperatures above 400 C.
onditions of Reactivity: Copper dust or mist may react with acetylene gas to form shock sensitive copper acetylides.

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

If Inhaled: Remove victim to fresh air and support breathing. Use medical oxygen if available. If breathing has stopped, use resuscitative breathing. If heart beat is absent, commence cardiopulmonary resuscitation. Seek medical attention immediately.

In Case of Eye Contact: Flush with water including under eyelids for 20 minutes. If irritation persists, contact physician.

In Case of Skin Contact: Remove contaminated clothing. Wash affected area with soap and water.

If Ingested: If victim is conscious and can swallow, give two glasses of water. Induce vomiting. Seek medical attention immediately.

otes to Physician: N/D

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

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

Signs, Symptoms and Effects of Exposure
Inhalation: May cause ulceration of the nose and throat.
Eye Contact: Dust solution can cause clouding of the cornea.
Skin Contact: Repeated contact may cause skin irritation.
Ingestion: May cause abdominal pain, nausea and gastritis.

Chronic Effects of Exposure: Prolonged skin contact may cause irritation and eczema.

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

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

LD50 Oral (rat): 300 mg/kg
LD50 Dermal (rabbit): N/D
LC50 (species): N/D

Carcinogenicity: N/D
Sensitization: N/D
Irritancy: May cause skin irritation.
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): Local ventilation to control ambient dust levels to the permissible exposure limit.

Personal Protective Equipment
Respiratory: Approved dust.
Eye: Glasses or safety goggles.
Clothing: To minimize skin contact.
Footwear: N/D
Hands: Rubber gloves.
Other Protective Measures: Make eye wash stations available in areas of product use.

Action to Take for Spills or Leaks: Contain spill. Prevent entry into water intakes and waterways. Sweep or vacuum dust and return to process.

Waste Disposal Method: Salvage or return to process. Dispose of only in accordance with applicable regulations.

Storage and Handling Precautions and Equipment: Store in dry covered area. Protect from physical damage. Avoid breathing dust. Minimize skin contact. Practice good housekeeping.

Special Shipping Information: N/D
Other Precautions: N/D

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

TDG Classification
Shipping Name: Cupric Sulphate
UN: 9109
Class: 9.2
PKG: II

WHMIS Classification: D.1B

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----------

11/92: 3-year revision (P1352).

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

SECTION 6

Latest Revision - November 10, 1995

HYDROCHLORIC ACID

6.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

6.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

6.3 INITIAL SPILL RESPONSE

a. Stop spill at source, if possible.

b. Dilute with water and neutralize with soda ash.

c. Dyke and contain from entering waterways and sewers.

d. Dispose of in authorized disposal area.

6.4 HAZARDS

a. Very corrosive and can cause severe burns.

b. Fumes will irritate respiratory tract; effects may be delayed.

6.5 ACTION FOR FIRE

a. Use personal protective gear and full breathing apparatus, if required.

b. use fine water spray to limit spreading.

6.6 RECOVERY

Dispose of neutralized residues to the tailings pond area; submerge in water.

6.7 DISPOSAL

a. Neutralize and return to proper mill circuit or dispose of in tailings area.

6.8 PROPERTIES

a. Colorless liquid.

b. Strong pungent odor.

c. Very corrosive to exposed skin or eyes.

6.9 ENVIRONMENTAL THREAT

Acid, avoid contact with watercourses.

6.10 CONTAINERS

a. 250 kg drums

6.11 SUPPLIER

Van Waters & Rogers, Vancouver

L1245 MATERIAL SAFETY DATA SHEET PAGE 1

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

SALES ORDER:

VAN WATERS & ROGERS PRODUCT: 30664

MSDS NUMBER: L1245 VERSION: 1

DATE PRINTED: 17/11/92

NICKEL PLATE MINE
HEDLEY, B.C.
ATTENTION: DENISE
FAX #1-292-8266

HYDROCHLORIC ACID

SECTION 9

WHMIS CODES: D.1A E

EMERGENCY ASSISTANCE

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

PRODUCT INFORMATION

Product Name: HYDROCHLORIC ACID 20 BE VW&R Code: L1245

Common Name/Synonym: Muriatic Acid, Hydrogen Chloride Solution
CAS Registry Number: 7647-01-0
Chemical Name: N/D
Chemical Family: Inorganic acid
Formula: HCl
Molecular Weight: N/D
Product Use: N/D

PREPARATION INFORMATION

Date Issued: 09/92
Supercedes: 11/89 (P1125)
Prepared By: MSDS Coordinator. Contact during business hours, Eastern Time (416) 736-9299.

HAZARDOUS INGREDIENTS

Component(s)/CAS No.	% wt.	Exposure Limits, ppm OSHA PEL	ACGIH TLV
Hydrogen chloride (7647-01-0)	31.5%	5 Ceiling	5 Ceiling
Water (7732-18-5)	Balance	N/D	N/D

Local regulated limits may vary.

PHYSICAL PROPERTIES

Boiling Point: 178 F (81.5 C)
Melting Point: -53 C approx.
Freezing Point: N/D
Specific Gravity (Water=1): 1.16
Vapour Pressure: 25 mmHg, 3.3 kpa at 20 C
Vapour Density (Air=1): 1.3 at 20 C
pH: N/D
Solubility in Water: Infinite
% Volatile: N/D
Evaporation Rate (Butyl Acetate=1): N/D
Odour Threshold: N/D
Coefficient of Water/Oil Distribution: N/D

Physical State: Liquid.

FIRE AND EXPLOSION INFORMATION

Flash Point/Method: None
Lower Flammable Limit: N/AP
Upper Flammable Limit: N/AP
Autoignition Temperature: N/D

Extinguishing Media: Non-flammable. Use water spray, fog, foam, dry chemicals, CO2, or other agents as appropriate for surrounding fire.

Special Fire Fighting Procedures: Wear positive pressure self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Hydrochloric acid itself is non-flammable. There is, however, a latent fire or explosion hazard due to hydrogen gas generated when acid is in contact with metals.

Hazardous Combustion Products: N/D
Explosion Data
Sensitivity to Mechanical Impact: N/D
Sensitivity to Static Discharge: N/D
Conditions of Flammability: N/D

HAZARDOUS REACTIVITY

Stability: Stable
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Contact with metals may cause generation of flammal concentrations of hydrogen gas.
Materials to Avoid: Avoid base and corrosive materials. Avoid contact with most metals. Avoid oxidizing material, can oxidize to chlorine.
Hazardous Decomposition Products: None.
Conditions of Reactivity: N/D

FIRST AID MEASURES

If Inhaled: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physicia

In Case of Eye Contact: Immediate and continuous irrigation with flowin water at least 30 minutes is imperative. Prompt medical consultation is essential.

In Case of Skin Contact: Immediate continued and thorough washing in flowing water for 30 minutes is imperative while removing contaminated clothing. Prompt medical consultation is essential.

If Ingested: Do not induce vomiting. Give large amounts of water or mi if available and transport to medical facility.

Notes to Physician: Corrosive. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagoscopic control. If burn present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physicia in response to reactions of the patient.

HEALTH HAZARD INFORMATION

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

Signs, Symptoms and Effects of Exposure
Inhalation: Excessive vapour concentrations are readily attainable and cause serious adverse effects, even death. Excessive exposure may cause severe irritation and injury to upper respiratory tract and lungs.

Eye Contact: May cause pain, lachrymation (tears), and severe irritatio with corneal injury which may result in permanent impairment of vision, even blindness.

Skin Contact: Short single exposure may cause severe skin burns.

Skin Absorption: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The dermal LD50 has not been determined.

Ingestion: Ingestion may cause gastrointestinal irritation or ulceratio and severe burns of the mouth and throat.

Chronic Effects of Exposure: Repeated excessive exposure may cause eros of teeth and bleeding and ulceration of nose, mouth and gums. Did not cause cancer in long-term animal studies.

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

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

LD50 Oral (rat): 900 mg/kg
LD50 Dermal (rabbit): N/D
LC50 (rat): 3124 ppm 1H
Aquatic Toxicity : 96 hr LC50 = 50-500 mg/L

Carcinogenicity: Tests on animals demonstrate no carcinogenic activity.
Sensitization: N/D
Irritancy: N/D
Reproductive Effects: N/D
Teratogenicity: N/D
Mutagenicity: Tests in bacterial and mammalian cell cultures demonstrat no mutagenic activity.
Toxicologically Synergistic Products: N/D
Other Data: N/D
Environmental Effects: N/D

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

Ventilation (Engineering Controls): Control airborne concentrations bel the exposure guideline. Use only with adequate ventilation. Local exha ventilation may be necessary for some operations.

Personal Protective Equipment
Respiratory: When airborne exposure guidelines and/or comfort levels ma be exceeded, use an approved air-purifying respirator. For emergency an other conditions where the exposure guideline may be greatly exceeded, u an approved positive-pressure self-contained breathing apparatus.

Eye: Use chemical goggles. If vapour exposure causes eye irritation, u a full-face respirator. Wear a face-shield which allows use of chemical goggles, or a full-face respirator, to protect face and eyes when there any likelihood of splashes.

Clothing: Use protective clothing impervious to this material. Selectio of specific items such as gloves, boots, apron, or full-body suit will depend on operation. Safety shower should be located in immediate work area. Wash contaminated clothing before reuse. Dispose of contaminated shoes.

Other Protective Measures: Eye wash fountain and safety shower should b located in immediate work area.

Action to Take for Spills or Leaks: Small quantities may be flushed wit copious quantities of water; in case of larger amounts, contain liquid. Use limestone, lime or soda ash to cautiously neutralize since considerab amounts of heat and steam may be generated on neutralization.

Waste Disposal Method: Dispose of spilled, neutralized, or waste product contaminated soil and other materials in licensed landfill or treatment facility in accordance with all local, provincial, and federal regulation

Storage and Handling Precautions and Equipment: Protect container from physical damage. Do not strike containers or fittings with tools or hard objects. Keep container closed and dry. Store away from heat and oxidizing agents. Emptied container may retain vapour and product residu Prevent all contact with eyes and skin. Wash thoroughly after handling.

L1245 MATERIAL SAFETY DATA SHEET PAGE

Special Shipping Information: N/D
Other Precautions: N/D

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

TDG Classification
Shipping Name: Hydrochloric Acid
UN: 1789
Class: 8 (9.2)
PKG: II

UHMIS Classification: D.1A; E

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----------

09/92: 3-year revision. Reconstruction P1125

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

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

SECTION 7

Latest Revision - November 10, 1995

QUICKLIME

7.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

7.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

7.3 INITIAL SPILL RESPONSE

a. Stop spill at source, if possible.

b. Avoid dusting.

c. Keep dry. Prevent from entering watercourses.

d. Shovel into containers.

7.4 HAZARDS

a. Heat generated when mixed with water.

b. Strong alkaline - protect from exposure, especially eyes.

7.5 ACTION FOR FIRE

a. Non-flammable.

7.6 RECOVERY

Dispose of recovered solids by recycling material through the crushing circuit to the mill process.

7.7 DISPOSAL

a. Shovel and contain dry material.

b. Dyke and contain milk of lime and pump into proper mill circuit.

7.8 PROPERTIES

a. White powder to granular.

b. Very alkaline; very corrosive to eye surfaces.

c. Effects of acute exposure - corrosive.

d. Effects of chronic exposure are burns, ulceration, blindness.

7.9 ENVIRONMENTAL THREAT

None. Contain and return materials as above (DISPOSAL).

7.10 CONTAINERS

Truck load of bulk crushed lime.

7.11 SUPPLIER

Continental Lime, Cache Creek, B.C.

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Identifier >	CALCIUM OXIDE,QUICKLIME,HOTLIME (Pebble, Crushed, Pulverized)	WHMIS Classification: CLASS " E " CORROSIVE	CALCIUM OXIDE/ QUICKLIME SECTION 11
Product Use >	VARIOUS		

Manufacturers Name:	CONTINENTAL LIME LTD.	Suppliers Name:	CONTINENTAL LIME LTD.
Street Address:	P.O. BOX 187	Street Address:	P.O. BOX 187
City: Pavilion	Province: British Columbia	City: Pavilion	Province: British Columbia
Postal Code: V0K 1H0	Emergency Phone No: (604)457-6293	Postal Code: V0K 1H0	Emergency Phone No: (604)457-6293

SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Ingredients	%	Cas No.	LD 50 of Ingredient (Specify Species & Route)	LC 50 of Ingredient (Specify Species)
CALCIUM OXIDE (CaO)	96.4	1305-78-8	N/AV	N/AV

SECTION 3 - PHYSICAL DATA

Physical State: SOLID	Odour and Appearance: ODOURLESS, GREYISH WHITE VARIOUS SIZES			Odour Threshold (ppm): N/AP
Vapour Pressure: (mmHg) N/AP	Vapour Density: (air = 1) N/AP	Evaporation Rate: N/AP	Boiling Point (C): 2850	Freezing Point (C): N/AP
ph - 12 STRONG ALKALINE	Specific Gravity: (H2O = 1) 3.2 - 3.4	Coeff. Water/Oil Dist: N/AP		

SECTION 4 - FIRE AND EXPLOSION DATA

Flammability: Yes No X	If yes, under which conditions? >	
Means of Extinction: NON FLAMMABLE, USE EXTINGUISHING MEDIA WHICH IS APPROPRIATE FOR SURROUNDING FIRE		
Flashpoint (C) and method: N/AP	Upper Flammable limit: N/AP (% by Volume)	Lower Flammable limit: N/AP (% by Volume)
Autoignition Temperature (C): N/AP	Hazardous Combustion Products: N/AP	
Explosion Data >	Sensitivity to Impact: N/AP	Sensitivity to Static Discharge: N/AP

SECTION 5 - REACTIVITY DATA

Chemical Stability: Yes X No	If no under Which Conditions >	
Incompatibility with other Substances: Yes X No	If so Which ones? >	IF MATERIAL COMES IN CONTACT WITH WATER OR ANY SUBSTANCE CONTAINING WATER, INTENSE HEAT IS GENERATED. BECOMES CORROSIVE AFTER CONTACT WITH WATER. WILL REACT WITH ACIDS.
Reactivity, and under what Conditions:		N/AP
Hazardous Decomposition Products:		None

Product Identifier >	CALCIUM OXIDE, QUICKLIME, HOT LIME, (Pebble, Crushed, Pulverized)

SECTION 6 - TOXICOLOGIAL PROPERTIES

Route of Entry: Skin Contact X Skin Absorption — Eye Contact X Inhalation X Ingestion X

Effects of Acute Exposure to Product: IF INHALED CAN CAUSE SEVERE BURNS TO RESPIRATORY SYSTEM, WILL BURN THE SKIN WHENEVER MOISTURE IS PRESENT. IF INGESTED, SEVERE BURNS COULD RESULT. COULD BURN EYES. SEE SECTION #8 FIRST AID MEASURES.

Effects of Chronic Exposure to Product: IF PREVENTIVE MEASURES SECTION #7 ARE NOT ADHERED TO: CHRONIC EXPOSURE CAN CAUSE OCCASIONAL ULCERATION AND/OR PERFORATION OF THE NASAL SPUTUM , IRRITATE EYES, SKIN, RESPIRATORY.

Exposure Limits:	Irritancy of Product:	Sensitization to Product:	Carcinogenicity:
5 mg/M3 Lime	RESPIRATORY SYSTEM NASAL PASSAGES, EYES, SKIN, EXPOSED CUTS OR SCRAPES	N/AP	N/AP
Teratogenicity:	**Reproductive Toxicity:**	**Mutagenicity:**	**Synergistic Products:**
N/AP	N/AP	N/AP	N/AP

SECTION 7 - PREVENTIVE MEASURES

Personal Protective Equipment:
LONG SLEEVED SHIRT WITH COLLAR BUTTONED, TROUSERS WITH LEGS DOWN OVER BOOT TOPS.

Gloves (specify):	Respirator (specify):	Eye (specify):
AVOID GETTING MATERIAL INSIDE WHERE PERSPIRATION COULD CAUSE BURNS	APPROVED FILTER MASK SHOULD BE WORN IF EXCESSIVE DUST IS CREATED	TIGHT FITTING GOGGLES SHOULD BE WORN
Clothing (specify):	**Footwear (specify):**	**Other (specify):**
SHOULD BE WORN TO PREVENT LIME FROM CONTACTING SKIN	AVOID GETTING MATERIAL INSIDE WHERE PERSPIRATION COULD CAUSE BURNS	BARRIER CREAMS ON EXPOSED SKIN

Engineering Controls (specify, eg. Ventilation, Enclosed Process) :
LOCAL EXHAUST AS NECESSARY TO MAINTAIN AIRBORNE LEVELS WITHIN PRESCRIBED LIMITS.

Leak and Spill Procedure :
KEEP SPILLED MATERIAL AWAY FROM ORGANIC MATERIAL AND WATER.

Waste Disposal : CAREFULLY PICK UP SOLID MATERIAL AND COLLECT IN METAL CONTAINERS WITH COVER FOR DISPOSAL. THE TRACE AMOUNTS OF RESIDUE CAN BE FLUSHED INTO THE DRAIN, USING PLENTY OF WA LARGE AMOUNTS MAY REQUIRE NEUTRALIZATION BY ACID.

Handling Procedures and Equipment:
AVOID CREATING DUST. KEEP CONTAINERS CLOSED TO AVOID BREATHING DUST AND EYE CONTACT. KEEP PRODUCT DRY.

Storage Requirments :
STORE IN COOL, " DRY ", WELL-VENTILATED AREA OUT OF DIRECT CONTACT WITH WEATHER.

Special Shipping Information : DANGEROUS GOODS PERMIT NO. EU 0717 C FOR CALCIUM OXIDE BY ROAD VEHICLE OR SHIP ONLY, EXPIRY DATE : JANUARY 31, 1994, EXEMPTS NAMED MEMBERS FROM THE PROVISION OF THE " TRANSPORTATION OF DANGEROUS GOODS REGULATIONS ".

SECTION 8 - FIRST AID MEASURES

Specific Measures :

If Inhaled in Excessive Amounts :	REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION AND CALL A DOCTOR.
Skin Burns :	WASH THOROUGHLY WITH SOAP AND WARM WATER, THEN VINEGAR TO REMOVE ALL LIME. APPLY BURN OINTMENT. KEEP BANDAGED DURING HEALING TO PREVENT INFECTION.
Eye Contact :	FLUSH AFFECTED EYE " IMMEDIATELY " WITH LARGE AMOUNTS OF WATER. DO NOT RUB EYES IF IRRITATED BY LIME DUST. FOLLOWING EYE WASH WITH WATER, USE BORIC ACID SOLUTION, THEN GET MEDICAL ATTENTION.
If Swallowed :	GIVE THREE TO FOUR GLASSES OF MILK OR WATER. DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.

SECTION 9 - PREPARATION DATE OF MSDS

Prepared by (Group, Department, etc.) :	Phone Number :	Date:
CALGARY DIVISION OFFICE	(403) 250 - 9100	November 10, 1995

SECTION 8

Latest Revision - November 10, 1995

LUBRICATING OILS

8.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

8.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

8.3 INITIAL SPILL RESPONSE

a. Stop spill at source, if possible.

b. Dyke and contain. Prevent from entering watercourses.

c. Remove all sources of ignition.

8.4 HAZARDS

a. Flammable.

b. Prolonged contact may cause dermatitis.

8.5 ACTION FOR FIRE

a. Use dry chemical or CO_2 extinguishers. Limit water because of product spread.

b. Remain upwind.

c. Respiratory protection may be required.

8.6 RECOVERY

Shovel into pail, dispose of in tailings pond area. Submerge in pond water.

8.7 DISPOSAL

a. Absorb with absorbent materials (straw, sorboil).

b. Pump into appropriate containers.

c. Remove contaminated soils.

d. Dispose in recognized disposal site.

8.8 PROPERTIES

a. Flammable.

b. Floats on water (not visible).

c. Viscous, oily liquid.

8.9 ENVIRONMENTAL THREAT

Avoid contact with watercourses.

8.10 SUPPLIER

Varies.

MATERIAL SAFETY DATA SHEET

Esso

Date Prepared: August 10, 1990
Supersedes: March 23, 1990
MSDS Number: 222965
Reference:

Cette fiche signalétique est aussi disponible en français

1. PRODUCT INFORMATION

Product Identifier: ESSOLUBE HDX PLUS 10W-30

Application and Use:
High quality all-season multigrade engine oil for use in gasoline and light duty diesel 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

TRANSPORTATION OF DANGEROUS GOODS INFORMATION

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

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 323-2145
Technical Info. (416) 968-6114

MANUFACTURER/SUPPLIER:

Esso Petroleum Canada
55 St Clair Avenue West
Toronto, Ontario
M4V 2J8
(416) 968-4111

2. REGULATED COMPONENTS

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

NAME	%	CAS #

No regulated components

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Viscosity: 10.20 cSt at 100 deg C
Boiling Point: 284 to 615 deg C
Evaporation rate: < 0.1 i.e. n-butylacetate
Solubility in water: 0.001% at 25 deg C
Freezing/Melting Point: -39 deg C DS7
Density: 0.89 g/cc at 15 deg C
Appearance/odour: Amber liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

Nature of Hazard

INHALATION:

Negligible hazard at normal temperatures (up to 35 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:

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:

Minimal 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.

OCCUPATIONAL EXPOSURE LIMIT:

Manufacturer recommends:
For oil mists, 5 mg/m3 recommended based on the ACGIH TLV.

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.
Do not handle or store near an open flame, sources of heat, or sources of ignition.

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

Please turn over

MATERIAL SAFETY DATA SHEET

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

GENERAL HAZARDS:

Low Hazard: liquids may burn upon heating to temperatures at or above the flash point.
Decomposes: flammable/toxic gases will form at elevated temperatures (thermal decomposition).
Toxic gases will form upon combustion.
Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

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:

Fumes, smoke, carbon monoxide and sulphur oxides in case of incomplete combustion

9. NOTES

10. PREPARATION

Prepared by: SPECIALTIES TECHNICAL SERVICES
ESSO PETROLEUM CANADA
55 St Clair Avenue West
Toronto, Ontario
M4V 2J8
(416) 968-5114

CAUTION

MATERIAL SAFETY DATA SHEET

Product name: SODIUM HYDROXIDE

6. HEALTH HAZARD AND FIRST AID DATA (Continued)

Teratogen	☐	Carcinogen	☐	Mutagen	☐
Reproductive Toxin	☐	Synergistic Products	☐	Not Fully Investigated	☒

FIRST AID

Eyes: Immediately flush eyes with large amounts of water for at least 30 minutes holding lids apart to ensure flushing of the entire surface. Obtain medical attention immediately.

Skin: Wash skin with copious quantities of water for at least 30 minutes. Remove contaminated clothing. Obtain medical attention immediately. Wash clothing before reuse.

Inhalation: Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.

Ingestion: Do not induce vomiting. If conscious, wash out mouth with water. Obtain medical attention immediately.

7. REACTIVITY DATA

Hazardous Polymerization: Will not occur.

Stability: Unstable. Absorbs carbon dioxide and moisture from air.

Incompatibility: Acids, water, flammable/combustible materials, organic materials, peroxides, organohalogen compounds (may react to form spontaneously combustible materials), nitro and chloro organic compounds (may react explosively). Acroleine, acrylonitrile, acetaldehyde (Violent polymerization). Reacts with most common metals to produce hydrogen.

Reaction Product(s): n/av.

8. PREVENTATIVE MEASURES

PROTECTIVE EQUIPMENT TO BE USED

Respiratory Protection: Wear appropriate OSHA/MSHA approved chemical cartridge respirator. If more than TLV, do not breathe vapor. Wear self-contained breathing apparatus.

Ventilation: Use only in a chemical fume hood. Adequate ventilation to maintain vapor/dust below TLV.

Skin Protection: Nitrile gloves. Apron or clothing to protect skin. Sufficient to protect skin.

Eye Protection: Face shield. Safety goggles.

Other Protective Equipment: Make eye bath and emergency shower available.

MATERIAL SAFETY DATA SHEET

Product name: SODIUM HYDROXIDE

8. PREVENTATIVE MEASURES (Continued)

SPILLAGE OR LEAKS PROCEDURES

Steps to be taken in case material is released or spilled:

Evacuate. Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Sweep up and place in container for disposal. Avoid raising dust. Ventilate area and wash spill site after material pick up is complete.

Waste disposal method:

Neutralize carefully with weak acid to pH 6 to 8. According to all applicable regulations. Avoid run off.

STORAGE AND HANDLING

Store in a cool place away from heated areas, sparks and flame. Store in a cool, dry area. Store in a well ventilated area. Store away from incompatible materials. Product is highly hygroscopic. Keep tightly closed. Empty container may contain hazardous residue. Do not add any other material to the container. Do not wash down the drain. Avoid raising dust. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling.

9. SPECIAL PRECAUTIONS OR COMMENTS

EXTREMELY CORROSIVE! CAUSES SEVERE BURNS! CORROSIVE EFFECTS ON SKIN AND EYES MAY BE DELAYED AND DAMAGE MAY OCCUR WITHOUT SENSATION OR ONSET OF PAIN. HARMFUL SOLID! DO NOT BREATHE DUST. AVOID ALL CONTACT WITH THE PRODUCT. USE ONLY IN A CHEMICAL FUMEHOOD.
CONDITIONS TO AVOID: NEVER ADD WATER TO SODIUM HYDROXIDE! WHEN MAKING SOLUTIONS, AVOID RAPID TEMPERATURE RISE BY ADDING SMALL AMOUNTS OF SODIUM HYDROXIDE SLOWLY AND EVENLY OVER SURFACE OF WATER.
200 MG/M3 IS IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.
. NFPA Hazard Rating Health - 3. Flammability - 0. Reactivity - 1.
. RTECS no. WB4900000.
POTASSIUM AND SODIUM HYDROXIDE HAVE BEEN IMPLICATED AS A CAUSE OF CANCER OF THE ESOPHAGUS IN INDIVIDUALS WHO HAVE INGESTED IT. THE CANCER MAY DEVELOP 12 TO 42 YEARS AFTER THE INGESTION INCIDENT. SIMILAR CANCERS HAVE BEEN OBSERVED AT THE SITES OF SEVERE THERMAL BURNS. THESE CANCERS MAY BE DUE TO TISSUE DESTRUCTION AND FORMATION RATHER THAN ACTION OF THE HYDROXIDE ITSELF.

n/av = not available
n/ap = not applicable

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. Anachemia shall not be held liable for any damage or injury resulting from handling or from contact with the above product.

SECTION 10

Latest Revision - November 10, 1995

PROPANE

10.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

10.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

10.3 INITIAL SPILL RESPONSE

a. Stop spill at source.

b. Turn container so gas escapes rather than liquefies.

c. Remove all sources of ignition.

10.4 HAZARDS

a. Very flammable. Low explosive range.

b. Vapor expands 267 times volume of liquid.

10.5 ACTION FOR FIRE

a. Cool container.

b. Do not put out flame until fire cools and pressure drops.

c. Approach tanks from side only.

10.6 RECOVERY

None. Do not permit any open flame near suspected leak area.

10.7 DISPOSAL

a. Allow vapor to burn off in controlled manner.

b. Remove all sources of ignition.

10.8 PROPERTIES

a. Low explosive limit.

b. Heavier than air. Seeks low areas.

c. Odorized with ethyl mercaptan.

d. Colorless.

e. Liquid will frost burn exposed skin.

10.9 ENVIRONMENTAL THREAT

Risk of fire or explosion.

10.10 SUPPLIER

ICG Propane, Superior or others.

Propane Page 2.

SECTION VI - Toxicological Data

te 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.

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.

Inhalation: Not determined.

Other: Not determined.

Irritation Index:

Skin: No appreciable effect (gas).

Eyes: No appreciable effect (gas).

Symptoms of Exposure: Above 10,000 PPM - Dizziness, stupor, unconsciousness. American Conference of Governmental Industrial Hygienists (ACGIH) classes propane as an asphyxiant. Manufacturer recommends an occupational exposure of 1,000 PPM (TWA).

SECTION VII - Occupational Control Procedures

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

Skin: Insulated gloves, 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.

SECTION VIII - Emergency and First Aid Procedures

First Aid:

s: 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 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).

- TDG Classification:	2.1
- TDG Shipping Name:	Liquefied Petroleum Gas
- TDG Special Provisions:	56, 90, 102
- UN/NA Code:	1075
- WHMIS Classification:	Class A - Compressed Gas Class B - Division 1 - Flammable Gas

SECTION X - Preparation Information

Prepared By:	Lyle Hammer	**Title:** Director, Safety	**Telephone:** (204) 949-6605
Checked By:	Madis Paas	**Title:** Director, Technical Services	**Telephone:** (204) 949-6622
Date:	March 1, 1991		

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.

NOV 17 '92 14:05 FROM ICG MARKETING 9496612 PAGE.002

ICG PROPANE INC.

MATERIAL SAFETY DATA SHEET

PROPANE
SECTION 14

SECTION I - Material Identification and Use

Product Name: Propane
Trade Name: LPG (Liquefied Petroleum Gas)
Chemical Formula: C_3H_8

Supplier: ICG Propane Inc.
444 St. Mary Avenue
Winnipeg, Manitoba
R3C 3T7
(204) 949-6500

Emergency Branch Telephone Number:
( )_____

Uses and Occurrence: Widely used as fuel in welding and cutting operation, heating, cooling and refrigeration, temporary construction heating. Used as an alternate fuel for automobiles and widely used as a fuel for forklift operation.

SECTION II - Hazardous Ingredients of Material

COMPONENTS	CAS NO.	PROPORTION OF PRODUCT	LC50	LD50
Propane	74-98-6	90% - 99% v/v	Not Applicable	Not Applicable
Ethane	74-84-0	0% - 5% v/v	Not Applicable	Not Applicable
Iso-Butane	75-28-5	0% - 2.5% v/v	Not Applicable	Not Applicable
Propylene	115-07-1	1% - 5% v/v	Not Applicable	Not Applicable

Note: Composition given is typical for HD 5 Propane. Exact compostion will vary from shipment to shipment.

SECTION III - Chemical and Physical Data

Form: While stored - Liquid and/or vapour
Boiling Point: -42°C @ Atmospheric Pressure
Freezing Point: -190°C @ Atmospheric Pressure
PH: Not available
Relative Density of Liquid: 0.51 (water = 1)
Coefficient of Water/Oil Distribution: Not available
Evaporation Rate: Rapid (Gas at normal ambient temperature)
Vapour Pressure: 637kPa @ 16°C
Relative Density of Vapour: 1.52 (air = 1)

Appearance: Colourless - liquid and vapour while stored. Colourless and odourless gas in natural state at any concentration. Propane sold for consumption has an odourant added which is commonly ethyl mercaptan, which has an odour similar to boiling cabbage..

Odour Threshold: 4,800 PPM.

SECTION IV - Fire and Explosion Hazard Data

Flash Point: -103.4°C **Method:** Closed Cup
Flammable Limits: Lower 2.4%, Upper 9.5%
Auto Ignition Temperature: 432°C
Products Evolved Due to Heat or Combustion: Carbon Monoxide can be produced when primary air and secondary air are deficient while combustion is taking place.
Fire and Explosive Hazards: Explosive air-vapour moisture may form if allowed to leak to atmosphere.
Special Fire Fighting Equipment: Protective clothing, hose monitors, fog nozzles, wear self contained breathing apparatus.

Fire Extinguishing Precautions:
Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC).
Container metal shells require cooling with water to prevent flame impingement and the weakening of metal.
If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated. For small outdoor fires which may easily be extinguished with a portable fire extinguisher, use of a SCBA may not be required.

SECTION V - Reactivity Data

Stability: Stable
Conditions to Avoid: Keep separate from oxidizing agents.
Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks from combustible material, drains, and openings to buildings.
Hazardous Decomposition Products: Deficient primary and secondary air can produce carbon monoxide.
Hazardous Polymerization: Will not occur.

SECTION 11

Latest Revision - November 10, 1995

SODIUM NITRATE

11.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

11.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

11.3 INITIAL SPILL RESPONSE

a. Stop spill at source, if possible.

b. Shovel dry spill to suitable container; dispose of in the tailings pond or to the milling process.

c. Do not allow to enter the waterways.

11.4 HAZARDS

a. Strong oxidizer.

b. Keep away from cyanides, poured metals, sodium thiosulfate, sulfur, plus charcoal and reducing agents.

c. Keep away from high heat, organics and impacts.

11.5 ACTION FOR FIRE

a. During a fire, water fog, carbon dioxide or dry chemical may be used.

b. Remain upwind. Decomposes to form nitrogen oxides.

c. Cool containers exposed to heat.

11.6 RECOVERY

a. Dispose of any recovered solids to tailings, submerging in water or within the milling process in grinding.

11.7 DISPOSAL

a. Shovel spilled material into suitable container and return to the mill process on tailings basin.

11.8 PROPERTIES

a. Eye, nose and throat irritant.

b. Harmful if swallowed, dizziness, cramps, vomiting, headache, mental impairment, cyanosis.

c. Reacts with acids to give off oxides of nitrogen.

d. Colorless.

e. Liquid will frost burn exposed skin.

11.9 ENVIRONMENTAL THREAT

a. Hazardous to human and aquatic life.

b. Soluble in water.

11.10 SUPPLIER

Canada Colors and Chemicals Limited

09/05/91 MATERIAL SAFETY DATA SHEET : 00000188 PAGE:1

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO, M3B 2R7
(416)-449-7750

PRODUCT : SODIUM NITRATE CHILEAN

SECTION 1 : MANUFACTURER INFORMATION

CHILEAN NITRATE SALES CORP.
109 EAST MAIN STREET
SUITE 500
NORFOLK, VIRGINIA, USA
23510

T.D.G. CLASSIFICATION.....5.1
UN NUMBER.....1498
PACKING GROUP.....III
PRODUCT NAME.....SODIUM NITRATE (CHILEAN)
PRODUCT CODE.....845107, 845115
WHMIS CLASSIFICATION.....C
D2B
CHEMICAL FORMULA.....NaNO3
MOLECULAR WEIGHT.....85
CHEMICAL FAMILY.....INORGANIC
MATERIAL USE.....N.AV.

SECTION 2 : HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	T.L.V.	C.A.S. #	LD/50, ROUTE, SPECIE	LC/50, ROUTE, SPECIE
SODIUM NITRATE	99-100	--	7631-99-4	N.AV.	N.AV.

SECTION 3 : PHYSICAL DATA

PHYSICAL STATE.....SOLID
ODOUR.....N.AV.
ODOUR THRESHOLD.....N.AV.
VAPOUR PRESSURE (MMHG).....N.AP.
VAPOUR DENSITY (AIR=1).....N.AP.
BY VOLUME
BY WEIGHT
EVAPORATION RATE.....N.AP.
BOILING POINT.....N.AP.
PH.....N.AV.
SPECIFIC GRAVITY (WATER=1).....2.26
SOLUBILITY IN WATER (% W/W).....SOLUBLE
COEFFICIENT OF WATER/OIL.....N.AV.
DIST.

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO, M3B 2R7
(416)-449-7750

PRODUCT : SODIUM NITRATE CHILEAN

SECTION 4 : FIRE & EXPLOSION DATA

FLAMMABILITY.....NOT FLAMMABLE
IF YES, UNDER WHICH
CONDITIONS?
EXTINGUISHING MEDIA.....FLOOD WITH WATER IN EARLY STAGES. NITRATES MAY FUSE OR MELT IN LARGE FIRES AND WATER MAY RESULT IN SCATTERING OF MOLTEN MATERIAL. AVOID WATER ON MOLTEN SALT.
SPECIAL PROCEDURES.....USE WATER-SPRAY TO KEEP CONTAINERS COOL. FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS.
FLASH POINT (C), METHOD.....NONE
AUTO IGNITION TEMPERATURE.....N.AV.
T.D.G. FLAM. CLASS.....NONE
UPPER FLAMMABLE LIMIT (% BY.....N.AP.
VOL.)
LOWER FLAMMABLE LIMIT (% BY.....N.AP.
VOL.)
HAZARDOUS COMBUSTION PRODUCTS....N.AV.
EXPLOSION DATA
SENSITIVITY TO STATIC.....N.AV.
DISCHARGE
SENSITIVITY TO IMPACT.....N.AV.
RATE OF BURNING.....N.AV.
EXPLOSIVE POWER.....N.AV.

SECTION 5 : REACTIVITY DATA

CHEMICAL STABILITY:
YES.....YES
NO, WHICH CONDITIONS?
COMPATABILITY WITH OTHER
SUBSTANCES:
YES
NO, WHICH ONES?.....CYANIDES, POWDERED METALS, SODIUM THIOSULPHATE, SULPHUR PLUS CHARCOAL. REDUCING MATERIALS
REACTIVITY CONDITIONS?.....AT TEMPERATURES >1000 F. CONTACT WITH INCOMPATIBLES.
HAZARDOUS POLYMERIZATION.....WILL NOT OCCUR
HAZARDOUS PRODUCTS OF.....OXIDES OF NITROGEN
DECOMPOSITION

SECTION 6 : TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:
SKIN CONTACT.....IRRITANT.
SKIN ABSORPTION.....N.AV.
EYE CONTACT.....IRRITANT.
INHALATION.....NOSE AND THROAT IRRITATION

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO, M3B 2R7
(416)-449-7750

PRODUCT : SODIUM NITRATE CHILEAN

INHALATION, CHRONIC.....N.AV.
INGESTION.....HARMFUL IF SWALLOWED.
MUSCOUS MEMBRANE IRRITATION, DIZZINESS, ABDOMINAL CRAMPS, VOMITING,
HEADACHE, MENTAL IMPAIRMENT, CYANOSIS.
EFFECTS OF ACUTE EXPOSURE.....REFER TO ROUTE OF ENTRY
EFFECTS OF CHRONIC EXPOSURE.....SEE ABOVE
EXPOSURE LIMIT OF MATERIAL.....SEE SECTION II
IRRITANCY OF MATERIAL.....SEE ABOVE
SENSITIZING CAPABILITY OF.....N.AV.
MATERIAL
CARCINOGENICITY OF MATERIAL.....NONE
REPRODUCTIVE EFFECTS.....NONE
SYNERGISTIC MATERIALS.....NONE

SECTION 7 : PREVENTATIVE MEASURES

GLOVES/ TYPE.....WEAR IMPERVIOUS GLOVES (IN NEOPRENE OR RUBBER).
RESPIRATORY/TYPE.....USE NIOSH APPROVED RESPIRATOR.
EYE/TYPE.....GOGGLES
FOOTWEAR/TYPE.....BOOTS
CLOTHING/TYPE.....WEAR IMPERVIOUS PROTECTIVE CLOTHING.
OTHER/TYPE.....EYE BATH AND SAFETY SHOWER.
ENGINEERING CONTROLS.....VENTILATE ADEQUATELY.
LEAK/SPILL.....WEAR PROTECTIVE EQUIPMENT.
AVOID DUST ACCUMULATION.
PICK UP SOLIDS AND PLACE IN A TIGHTLY SEALED CONTAINER.
WASTE DISPOSAL.....IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.
HANDLING PROCEDURES AND.....MINIMIZE DUST GENERATION AND EXPOSURE.
EQUIPMENT
AVOID ALL SKIN CONTACT.
AVOID GETTING IN EYES.
USE ADEQUATE VENTILATION.
KEEP CONTAINER CLOSED.
WEAR NEOPRENE GLOVES IF DIRECT CONTANT LIKELY; WEAR EYE PROTECTION.
MAINTAIN A GOOD PERSONAL HYGIENE.
STORAGE NEEDS.....KEEP CONTAINER CLOSED WHEN NOT IN USE.
STORE AWAY FROM INCOMPATIBLE MATERIALS.
STORE IN A COOL AND WELL-VENTILATED AREA.
SPECIAL SHIPPING INSTRUCTIONS....SEE SECTION 1 TDG CLASSIFICATION.

SECTION 8 : FIRST AID MEASURES

INSTRUCTIONS:.....GET MEDICAL ATTENTION WITHOUT DELAY.
FLUSH EYES WITH ABUNDANT WATER.
FLUSH CONTAMINATED SKIN WITH PLENTY OF WATER.
IN CASE OF INHALATION, REMOVE TO FRESH AIR.
IN CASE OF INGESTION, SEEK MEDICAL ATTENTION.
INDUCE VOMITING OF CONSCIOUS VICTIM IMMEDIATELY BY GIVING TWO GLASSES OF
WATER AND PRESSING FINGER DOWN THROAT, WHILE KEEPING VICTIM'S HEAD BELOW

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO, M3B 2R7
(416)-449-7750

PRODUCT : SODIUM NITRATE CHILEAN

HIPS TO PREVENT ASPIRATION OF LIQUID INTO LUNGS. CONTACT A PHYSICIAN IMMEDIATELY.

SECTION 9 : PREPARATION INFORMATION

EMERGENCY PHONE NO.....(416)-444-2112
N.AP.=NOT APPLICABLE
N.AV.=NOT AVAILABLE
PREPARED BY.....TECHNICAL SERVICE DEPARTMENT
DATE.....08/01/91

SECTION 12

Latest Revision - November 10, 1995

SODA ASH

12.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

12.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

12.3 INITIAL SPILL RESPONSE

a. Stop spill at source, if possible.

b. Avoid dusting.

c. Keep dry. Prevent from entering water courses.

d. Shovel into containers.

12.4 HAZARDS

a. Avoid contact with acids.

b. Avoid contact with aluminum powder, chlorine, phosphorous, nitrate and molten lithium.

c. Reacts with hydrated lime to form caustic soda - a corrosive.

12.5 ACTION FOR FIRE

a. High temperature will cause decomposition to carbon monoxide, carbon dioxide or oxides of sodium.

b. Non flammable.

12.6 RECOVERY

a. Dispose of recovered solids by recycling material through the crushing circuit to the mill process.

12.7 DISPOSAL

a. Shovel spilled material into suitable container and return to the mill process.

12.8 PROPERTIES

a. Gray powder.

b. Harmful if swallowed, nausea, vomiting, diarrhea, collapse.

c. May cause blistering and redness if in contact with skin.

d. Eye, nose and throat irritant.

12.9 ENVIRONMENTAL THREAT

a.Moderately hazardous to human and aquatic life.

b. Soluble in water.

12.10 SUPPLIER

Van Waters and Rogers, Vancouver.

P1120 MATERIAL SAFETY DATA SHEET PAGE 1

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

SALES ORDER:
VAN WATERS & ROGERS PRODUCT: 62250
MSDS NUMBER: P1120 VERSION: 3
DATE PRINTED: 22/01/92

NICKEL PLATE MINE
ATTN: DENNISE
FAX 1-292-8266

WHMIS CODES: D.2B

----------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: SODA ASH
COMMON NAMES/SYNONYMS: SODIUM CARBONATE, ANHYDROUS
CAS NO.: 497-19-8
VW&R CODE: P1120
DATE ISSUED: 11/90
SUPERCEDES: 11/87
FORMULA: NA2 CO3
HAZARD RATING (MANUFACTURER)
HEALTH: 2
FIRE: 0
REACTIVITY: 0
SPECIAL: NONE
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

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

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, PPM OSHA PEL	ACGIH TLV	OTHER LIMIT	HAZARD
SODIUM CARBONATE	(497-19-8)	>99	NONE	NONE	NONE	IRRITANT

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

BOILING POINT, DEG F: NOT APPLICABLE
VAPOR PRESSURE, MM HG/20 DEG C: NOT APPLICABLE
MELTING POINT, DEG F: 1564
VAPOR DENSITY (AIR=1): NOT APPLICABLE
SPECIFIC GRAVITY (WATER=1): 2.533
WATER SOLUBILITY, %: 30
APPEARANCE AND ODOR: ODORLESS, WHITE POWDER OR GRANULAR SOLID OR CRYSTAL.
EVAPORATION RATE (BUTYL ACETATE=1): NOT APPLICABLE

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

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

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.

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: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER OR MILK. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY

IGNITION.

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

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: OPEN FLAMES, WELDING ARCS, OR OTHER HIGH TEMPERATURE SOURCES WHICH MAY INDUCE THERMAL DECOMPOSITION.

MATERIALS TO AVOID: ALUMINUM POWDER, FLUORINE, PHOSPHOROUS NITRATE AND MOLTEN LITHIUM. REACTS WITH HYDRATED LIME IN THE PRESENCE OF MOISTURE TO FORM CAUSTIC SODA, A CORROSIVE.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE, CARBON DIOXIDE OR OXIDES OF SODIUM.

----------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 WITH PARTICULATE FILTERS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS, SWEEP UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, SHOVEL INTO DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL.
COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

'OSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED 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, EASTERN TIME (416)-741-9190.

----------NOTICE----------

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

----------REVISION----------

0: REVISED MATERIALS TO AVOID.

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

HEALTH HAZARD INFORMATION

PRIMARY ROUTES OF EXPOSURE: INHALATION, SKIN OR EYE CONTACT.

SIGNS AND SYMPTOMS OF EXPOSURE
INHALATION: BREATHING DUST MAY IRRITATE THE NOSE AND THROAT AND CAUSE COUGHING AND CHEST DISCOMFORT. EXCESSIVE CONTACT CAN CAUSE DAMAGE TO THE NASAL SEPTUM.

EYE CONTACT: DUSTS WILL IRRITATE THE EYES AND PROLONGED CONTACT MAY DAMAGE THE EYES.

SKIN CONTACT: PROLONGED OR REPEATED CONTACT WITH THE DUST MAY IRRITATE THE SKIN WITH BLISTERING AND REDNESS. SOLUTIONS MAY CAUSE SEVERE IRRITATION OR BURNS.

SWALLOWED: SWALLOWING LARGE QUANTITIES MAY CAUSE NAUSEA, VOMITING, ABDOMINAL PAIN, DIARRHEA AND COLLAPSE,

CHRONIC EFFECTS OF EXPOSURE: MAY CAUSE SENSITIZATION.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

TOXICITY DATA

ORAL: RATS LD50 = 4 G/KG

DERMAL: RABBITS 500 MG/24 HR, MODERATE IRRITATION

INHALATION: NO DATA FOUND.

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: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAINTAINING DUST EMISSIONS AT THE POINT OF USE BELOW THE PEL.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE DUSTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR WITH PARTICULATE FILTERS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES AND FULL FACE SHIELD. 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, SAFETY SHOES, RUBBER GLOVES, AND RUBBER 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: NOT APPLICABLE UPPER: NOT APPLICABLE

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

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.

SECTION 13

Latest Revision - November 10, 1995

BORAX

13.1 ACTION STEPS

a. Report spill

b. Stop source if possible

c. Contain spill materials

d. Protect area

e. Remove material

f. Reclaim area

g. Complete spill report

13.2 NOTIFICATION

Immediately notify your Supervisor who will follow the procedure outlined in Section B.

13.3 INITIAL SPILL RESPONSE

a. Stop spill at source, if possible.

b. Keep dry. Prevent from entering water courses.

c. Shovel into containers.

13.4 HAZARDS

a. Avoid contact with fine, ground zirconium.

b. Nerve disorders, kidney and liver disease may be aggravated by chronic exposure.

13.5 ACTION FOR FIRE

a. Not flammable.

13.6 RECOVERY

a. Dispose of any recovered solids by recycling material through the mill process.

13.7 DISPOSAL

a. Shovel and contain dry material.

13.8 PROPERTIES

a. White granular solid.

b. Irritant to eyes, throat.

13.9 ENVIRONMENTAL THREAT

a. Hazardous to human and aquatic life.

b. Soluble in water.

13.10 SUPPLIER

Canada Colors and Chemicals Limited

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

PRODUCT : BORAX ANHYDROUS 12 MESH

SECTION 1 - MANUFACTURER INFORMATION

UNITED STATES BORAX & CHEMICAL
3075 WILSHIRE BLVD.
LOS ANGELES, CA
USA
90010

T.D.G. CLASSIFICATION.....NOT REGULATED
UN NUMBER.....N.AP.
PACKING GROUP.....N.AP.
PRODUCT NAME.....ANHYDROUS BORAX
PRODUCT CODE.....243006, 243039, 243105, 243105, 243204
WHMIS CLASSIFICATION.....D2A
CHEMICAL FORMULA.....Na2B4O7
MOLECULAR WEIGHT.....201.27
CHEMICAL FAMILY.....BORATE
MATERIAL USE.....MANUFACTURE OF GLAZES, ENAMELS. FLUX FOR SOLDERING NON-FERROUS METALS AND ALLOYS IN CLEANING COMPOUNDS, ANTISEPTICS, PRESERVATIVE.

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	T.L.V.	C.A.S. #	LD/50, ROUTE, SPECIE	LC/50, ROUTE, SPECIE
SODIUM TETRABORATE ANHYDROUS	98-100	1 MG/M3	1330-43-4	2.4-2.6 G/KG SPRAGUE-DAWLEY RATS	N.AV.

SECTION 3 - PHYSICAL DATA

PHYSICAL STATE.....SOLID
ODOUR.....NO ODOUR
ODOUR THRESHOLD.....N.AV.
VAPOUR PRESSURE (MMHG).....NEGLIGIBLE
VAPOUR DENSITY (AIR=1).....N.AP.
EVAPORATION RATE.....N.AP.
BOILING POINT.....N.AP.
PH.....8.25
SPECIFIC GRAVITY (WATER=1).....2.367
SOLUBILITY IN WATER (% W/W).....5.8 (25 (C)).
COEFFICIENT OF WATER/OIL.....N.AV.
DIST.

CANADA COLORS AND CHEMICALS LIMITED
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(416) 449-7750

PRODUCT : BORAX ANHYDROUS 12 MESH

SECTION 4 : FIRE & EXPLOSION DATA

FLAMMABILITY.....NOT FLAMMABLE
IF YES, UNDER WHICH
CONDITIONS?
EXTINGUISHING MEDIA.....NOT REQUIRED
PRODUCT IS A FIRE RETARDANT.
SPECIAL PROCEDURES.....N.AP.
UNUSUAL FIRE AND EXPLOSION.....NONE
HAZARDS
FLASH POINT (C), METHOD.....N.AP.
AUTO IGNITION TEMPERATURE.....N.AP.
T.D.G. FLAM. CLASS.....NOT REGULATED
UPPER FLAMMABLE LIMIT (% BY.....N.AP.
VOL.)
LOWER FLAMMABLE LIMIT (% BY.....N.AP.
VOL.)
HAZARDOUS COMBUSTION PRODUCTS....SEE HAZARDOUS DECOMPOSITION PRODUCTS.
EXPLOSION DATA
SENSITIVITY TO STATIC.....NO
DISCHARGE
SENSITIVITY TO IMPACT.....NO
RATE OF BURNING.....N.AP.
EXPLOSIVE POWER.....N.AP.

SECTION 5 : REACTIVITY DATA

CHEMICAL STABILITY:
YES.....YES
NO, WHICH CONDITIONS?
COMPATABILITY WITH OTHER
SUBSTANCES:
YES
NO, WHICH ONES?.....NONE KNOWN.
REACTIVITY CONDITIONS?.....PRODUCT DISSOLVES SLOWLY IN WATER WITH EVOLUTION OF HEAT.
HAZARDOUS POLYMERIZATION.....WILL NOT OCCUR
HAZARDOUS PRODUCTS OF.....WHEN HEATED TO DECOMPOSITION, IT EMITS TOXIC FUMES OF SODIUM OXIDE.
DECOMPOSITION

SECTION 6 : TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:
SKIN CONTACT.....MAY CAUSE SLIGHT BURNING SENSATION DUE TO HEAT OF HYDRATION.
SKIN ABSORPTION.....CAN BE ABSORBED THROUGH DAMAGED SKIN, SYMPTOMS SAME AS FOR INGESTION.
EYE CONTACT.....IRRITATION (NON-CORROSIVE).
INHALATION.....EXCESSIVE INHALATION OF BORATE DUST MAY CAUSE NASAL AND THROAT IRRITATION.
INHALATION, CHRONIC.....SEE ABOVE
INGESTION.....MAY CAUSE NAUSEA, VOMITING, DIARRHEA IF INGESTED IN LARGE AMOUNTS.

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416)-449-7250

PRODUCT : BORAX ANHYDROUS 12 MESH

TOXIC EFFECTS MAY BE DELAYED.

EFFECTS OF ACUTE EXPOSURE.....SEE ABOVE

EFFECTS OF CHRONIC EXPOSURE.....EYES: POSSIBLE IRRITATION.
SKIN: SLIGHT, REVERSIBLE ERYTHEMA AND/OR RASH.
NO EFFECTS ON INTACT SKIN.
INGESTION: ERYTHEMA, MACULAR RASH, DIZZINESS, CNS EFFECTS.

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

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

EXPOSURE LIMIT OF MATERIAL.....SEE SECTION II

IRRITANCY OF MATERIAL.....SEE ABOVE

SENSITIZING CAPABILITY OF MATERIAL.....N.AV.

CARCINOGENICITY OF MATERIAL.....NOT LISTED BY IARC OR ACGIH

REPRODUCTIVE EFFECTS.....NO SYMPTOMS HAVE BEEN NOTED IN HUMANS.
ANIMAL STUDIES SHOW THAT INGESTION OF LARGE AMOUNT OF BORATES OVER PROLONGED PERIODS OF TIME CAUSE A DECREASE IN SPERM PRODUCTION AND TESTICLE SIZE IN MALE LABORATORY ANIMALS AND DEVELOPMENTAL EFFECTS IN FETUSES OF PREGNANT FEMALE LABORATORY ANIMALS.

SYNERGISTIC MATERIALS.....NOT KNOWN

SECTION 7 - PREVENTATIVE MEASURES

GLOVES/ TYPE.....INTACT SKIN: CLOTH GLOVES; DAMAGED SKIN: RUBBER OR IMPERVIOUS.

RESPIRATORY/TYPE.....NIOSH/MSHA APPROVED MECHANICAL FILTER RESPIRATOR.

EYE/TYPE.....DUST GOGGLES

FOOTWEAR/TYPE.....NO SPECIAL REQUIREMENTS.

CLOTHING/TYPE.....NO SPECIAL REQUIREMENTS.

OTHER/TYPE.....EYE BATH AND SAFETY SHOWER.

ENGINEERING CONTROLS.....LOCAL EXHAUST IS SUFFICIENT.

LEAK/SPILL.....WEAR PROTECTIVE EQUIPMENT.
VACUUM SPILLS FOLLOWED BY WATER RINSE.
AVOID GENERATING EXCESSIVE DUST.

WASTE DISPOSAL.....IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.

HANDLING PROCEDURES AND EQUIPMENT.....AVOID DUST CLOUD FORMATION.
AVOID SKIN AND EYE CONTACT. AVOID BREATHING DUST. REMOVE CONTAMINATED CLOTHING BEFORE REUSE.
AVOID PROLONGED EXPOSURE TO HIGH CONCENTRATIONS.
RETAIN PACKAGE INTEGRITY.

STORAGE NEEDS.....DRY INDOOR STORAGE.

SPECIAL SHIPPING INSTRUCTIONS.....SEE SECTION 1 TDG CLASSIFICATION.

SECTION 8 - FIRST AID MEASURES

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.

CANADA COLORS AND CHEMICALS LIMITED
80 SCARSDALE ROAD
DON MILLS, ONTARIO, M3B 2R7
(416)449-7750

PRODUCT : BORAX ANHYDROUS 12 MESH

CONSULT A PHYSICIAN.
WASH SKIN WITH SOAP AND WATER.
IN CASE OF INHALATION, REMOVE TO FRESH AIR.
IF INGESTED, INDUCE VOMITING BY PRESSING FAR BACK ON TONGUE.
GIVE LARGE QUANTITIES OF WATER OR MILK.
NEVER GIVE ANYTHING BY MOUTH IF THE VICTIM IS UNCONSCIOUS.
GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN:.....GASTRIC LAVAGE WITH 5% SODIUM BICARBONATE IS SUGGESTED. THIS SHOULD BE FOLLOWED BY SALINE CATHARSIS. ASSURE ADEQUATE HYDRATION. ANHYDROUS BORAX IS NOT CONSIDERED AN ACUTE POISON. AFTER INGESTION OR ABSORPTION INTO THE BLOODSTREAM OF LARGE AMOUNTS (15 GRAMS OR MORE), SYMPTOMS MAY APPEAR AFTER 24-72 HOURS. BORATES ARE READILY DISSIPATED THROUGH THE URINE (70% IN THE FIRST 24 HOURS). COMPLIMENTARY BLOOD ANALYSIS IS AVAILABLE FOR PHYSICIANS AND EMERGENCY ROOMS. MEDICAL CONSULTATION IS ALSO AVAILABLE. CALL (714) 774-2673.

SECTION 9 - PREPARATION INFORMATION

EMERGENCY PHONE NO.....(416)-444-2112
N.AP.=NOT APPLICABLE
N.AV.=NOT AVAILABLE
PREPARED BY.....TECHNICAL SERVICE DEPARTMENT
DATE.....08/01/91

SECTION VI

Ref: Screening Report Section 6.2

Also Ref: Water Licence Application Section 5.9

PIT WALL AND FLOOR ARD MITIGATION PLAN

5.9.2 Pit Wall and Floor Acid Rock Drainage (ARD) Potential

Waste rock characterization work, presented in the IEE, has indicated that portions of the lower pit wall and floor may contain rock with a potential for ARD. Exposure of this rock to oxidation could result in the release of contaminated water to the environment. Therefore additional assessment work will be required to characterize and quantify rock exposed during open pit mining.

5.9.2.1 Objectives

The objective of this program will be to collect sufficient mineralogical and chemical data to determine whether exposure of the pit wall and floor at closure could result in a release of ARD to the environment. If the data demonstrates that there a risk that a release ARD could occur, options for mitigation, proposed in the IEE documents, will be evaluated and implemented as part of Reclamation activities. Selection of the preferred option will be supported by the technical data.

5.9.2.2 Study Methodology

ARD assessment data on the pit wall and floor will be collected as follows:

1) After completion, the pitwall will be sampled directly to determine rock type and ARD characteristics.

2) Approximately 20 samples will be collected from the pit wall and pit floor. These samples will be representative of the individual rock types exposed after mining is complete.

3) The samples will be catalogued according to rock type, location, and physical characteristics. All samples will be assayed for Acid Base Accounting using the Modified Procedure. Analyses on all samples will include Total Sulphur, Sulphide Sulphur, Sulphate and Total Metals via Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES).

4) Variability within each rock type grouping will be assessed using frequency and cumulative distribution plots of Maximum Potential Acidity (MPA) or Percent Sulphide ($\%S^{=}$), Neutralization Potential (NP), Net Neutralization Potential (Net NP) and Neutralization Potential Ratio (NPR).

5) Monitoring of seepage from the pitwall will also be conducted during operation to verify the ARD prediction testwork.

5.9.2.3 Schedule

The pit wall sampling and ARD assessment program will be conducted during operation.

5.9.2.4 Report Submission

A report will be prepared to present the data within 60 days of completion of the testwork. This report will assess the potential for ARD occurring in the wall rock for each rock type grouping. The report will also outline proposed mitigation measures (if required) for review and approval.

5.9.2.5 Decision Criteria

The criteria used to assess the potential for ARD from the pitwall and floor after closure will be based on the characteristics and quantities of each rock type identified in the above report. Wall rock with a substantial potential for ARD such as material containing a high percent sulphur, would likely require that the pit be flooded as soon as possible after closure. Alteratively wall rock materials with a low potential for ARD may require backfilling with non-acid generating waste rock.

SECTION VII

Ref: Screening Report Section 6.3

Also Ref: Water Licence Application Section 3.1.6

PIT SEEPAGE MITIGATION PLAN

3.1.6.1 Seepage from the Pit Floor to the Old Underground Adit

B.Y.G. proposes to eliminate all concern regarding seepage from the pit by sealing the adit prior to final abandonment

It is agreed that monitoring and sampling of any flow from the adit will be a condition of the licence.

SECTION VIII

Ref: Screening Report Section 6.5.1

THAW SETTLEMENT PROGRAM

Thaw Settlement

It has been estimated that the zone of thawing in the foundation soils will extend only one-third of the width of the tailings dam from the upstream toe. It has been estimated that this thawing will confined to the upper 1 to 2 m of the foundation soils in the area underlying the upstream slope of the dam and up to 5 m under the pond.

Complete thaw of the foundation soils beneath the dam is not predicted during the operational phase of the impoundment thereby reducing potential thaw-settlements. The rate of freezing can be accelerated by removal of snow on the downstream slope of the dam.

In the event the tailings pond is operated for only three years, complete freeze back of the foundation soils beneath the dam is predicted after approximately 25 years. Extension of the mine life will however increase depths of thaw and the time for freeze back.

In the long-term, complete freezing of the dam is predicted with the final thaw boundary lying within the upstream deposited tailings resulting in a strong and impermeable dam.

The above predictions do not consider the effects of convective heat transfer by seepage beneath the dam. The effects of such seepage will be minimized by the presence of a tailings beach and the geosynthetic clay liner in the dam which will cutoff seepage through the dam and the upper part of the foundation. Seepage under the dam will be restricted by the presently ice-saturated, frozen foundation soils.

Irrespective of the above, the design takes into consideration long term measures which are required in the event of complete thaw of the foundation soils under the worst case condition.

Settlement of the dam will occur in areas where the foundation soils thaw and consolidate under the embankment loading. The area considered to have the greatest potential for thaw settlement is located in the base of the creek valley. Three test holes including DH95-06, DH95-08 and DH95-09 were drilled in this area. The proposed dam cross-section allows for a potential 0.6 m settlement during the first three years based on the estimated thaw settlement in the upper 4 m.

Objectives

The objectives of the Thaw Settlement Program will be:

1. Determine the thermal performance of the dam and underlying foundations.

2. Collect additional data to verify the conclusion that the maximum settlement of the dam crest will be 0.6 m and the conclusion that after closure the regional permafrost will aggrade upwards into the dam resulting in a strong and impermeable structure.

Study Methodology

Stability of the main dam embankment will initially be controlled by the presence of permafrost in the underlying foundation soils. The tailings dam overlying a frozen foundation is expected to behave more than adequately and stability is not an issue of concern.

The Thaw Settlement Program will be conducted as follows:

1. Record temperatures for each of the thermistor installations to determine rate and extent of thaw.

2. Record pore pressures for each of the pneumatic piezometers in embankment and foundation zones which are unfrozen. This will assist in determining seepage through the dam and will allow measurement of actual thaw-induced pore pressures for stability assessment.

3. Record settlements of dam crest by regular surveys of settlement pins. Settlements will be correlated with the depth of thaw and pore pressure dissipation to provide a basis for future settlement estimates.

4. Record daily maximum and minimum temperatures at the Mt. Nansen site. Comparison of data at the site with similar data recorded at the Environment Canada Station at Carmacks will provide a basis for adjustment of temperature data used in long term prediction models.

5. Record precipitation data at the Mt. Nansen site to determine runoff inflows.

6. Record tailings pond levels as well as inflow and outflow volumes. Quantities required for water balance assessment should include reclaim, seepage, evaporation and spillway discharges. Pumping rates should be recorded for determination of spigot, seepage and reclaim volumes. Rainfall records and measurement of snow pack in late winter should be required to assess runoff inflows. Spillway discharges should also be measured during operation to determine volumes of water which are diverted past the tailings pond. Comparison of diversion flows to runoff quantities will also provide an estimate of groundwater seepage inflows through the active zone.

7. Monitor the tailings beach development by survey to determine volume requirements and assist in planning of spigotting operations.

8. Record quantities and measured profiles of settled tailings to determine tailings densities and assess storage volume requirements.

9. Sample and measure the tailings gradation for assessment of the settling rate and permeability.

10. Monitor winter operations and tailings placement methods. Subaqueous deposition has been assumed for winter operations in order to minimize reservoir storage requirements.

Schedule

Collection of data will begin as soon as the tailings dam stucture has been completed and will continue until closure of the mine. Prior to completion of three years of operation, BYG are required to make a decision regarding raising of the dam for additional tailings storage or construction of the closure spillway for long term abandonment of the tailings impoundment. At that time the dam crest height should be reviewed and any additional allowance for longterm settlement made at that time. Should the dam performance and instrument monitoring suggest freezeback will occur after mine closure; then additional raising of the dam may not be required for settlement purposes.

The thermal performance of the dam and underlying foundation and the influence of the tailings will be monitored throughout the operational life of the impoundment to determine which long term solutions are required.

Dependant on the dam foundation performance, a downstream berm may eventually be required, however, construction of the berm can be delayed without serious ramifications until the actual performance of the dam can be monitored by the foundation instrumentation.

Report Submission

Thaw settlement data will be submitted on a quarterly basis and summarized in the Annual Report. The final report detailing the predictions for the long term behaviour of the dam will be produced within three months of closure.

Decision Criteria

The criteria used to assess any potential problem from thaw settlement will be based upon a comparison between the data collected from the instrumentation that will be installed on and in the tailings dam, and the values assumed for the purposes of predicting the dam performance. If the data indicates that the estimates made for the purposes of the dam design were not sufficient in providing for a safe and stable stucture then alternative measures will be taken to ensure that the design of the dam will provide for a long term stable structure.

SECTION IX

Ref: Screening Report Section 6.5.2

TAILINGS IMPOUNDMENT SEEPAGE PROGRAM

Seepage

The design of the main tailings dam is intended to minimize seepage of the pond water downstream of the dam into Dome Creek. This will ensure release of water from the tailings pond is controlled through treatment facilities and/or the emergency spillway and will also ensure that piping and loss of material does not occur at the downstream toe of dam due to uncontrolled seepage pressures.

The presence of a geosynthetic barrier on the upstream face of the dam and the presence of an ice saturated frozen foundation will provide initial barriers against seepage, however, the design must account for the long term potential of the foundation thawing with a corresponding increase in foundation permeability.

The limited seepage expected through the embankment and underlying foundation will be collected upstream of the seepage recovery dam where it can be returned to the tailings pond by pumping or released downstream if acceptable water quality is achieved. This small embankment for the seepage recovery dam will also be provided with a geosynthetic liner which will be keyed into the underlying permafrost. Details of the main dam, seepage recovery dam and geosynthetic clay liner are shown on Drawings B-5314-007 and -008.

Seepage analyses were carried out using the two dimensional finite element computer program SEEP/W by Geo-Slope International. The seepage model is shown on Figure A5-1 and the hydraulic parameters are listed below:

MATERIAL	HYDRAULIC CONDUCTIVITY (cm/s)	Kh/Kv
Bedrock	$1x10^{-7}$	1
Frozen Sand Foundation	$1x10^{-7}$	1
Thawed Sand Foundation	$1x10^{-3}$	1
Dam	$1x10^{-3}$	1
Tailings	$1x10^{-5}$	1

The design values of the hydraulic conductivity were based on laboratory testing and assumed values for similar type soils. For comparison, falling head permeability tests on recompacted samples of the foundation sand gave permeability values of $2x10^{-5}$ cm/s to $9x10^{-4}$ cm/s., falling head permeability tests on recompacted samples of the tailings gave permeability values of $1x10^{-5}$ cm/s. All materials were assumed to be isotropic with the ratio of horizontal and vertical permeabilities equal to unity.

Objectives

The objectives of the Seepage Monitoring Program will be:

1. Determine the Seepage through the dam and underlying foundations.

2. Collect additional data to verify the conclusion that the foundations of the dam will remain frozen and that seepage under the dam structure will not occur.

3. Collect additional date to verify the conclusion that the geosynthetic liner and tailings beach reduces the seepage by the required amount.

Study Methodology

The Seepage Monitoring Program will be conducted as follows:

1. Record pore pressures for each of the pneumatic piezometers in embankment and foundation zones which are unfrozen. This will assist in determining seepage through the dam and will allow measurement of actual thaw-induced pore pressures for stability assessment.

2. Sample and measure the tailings gradation for assessment of the settling rate and permeability.

3. measure the flow of seepage into the seepage recovery pond.

Schedule

Collection of data will begin as soon as the tailings dam stucture has been completed and filled with water and as soon as the temperature regime indicates that thawing has occured. The monitoring will then continue until freezing takes place or until closure of the mine.

The seepage performance of the dam and underlying foundation and the influence of the tailings will be monitored throughout the operational life of the impoundment to determine which long term solutions are required.

Dependant on the dam foundation performance, a downstream berm may eventually be required, however, construction of the berm can be delayed without serious ramifications until the actual performance of the dam can be monitored by the foundation instrumentation.

Report Submission

Seepage data will be submitted on a quarterly basis and summarized in the Annual Report. The final report detailing the predictions for the long term behaviour of the dam will be produced within three months of closure.

Decision Criteria

The criteria used to assess any potential problem from seepage will be based upon a comparison between the data collected from the instrumentation that will be installed on and in the tailings dam, and the values assumed for the purposes of predicting the dam performance. If the data indicates that the estimates made for the purposes of the dam design were not sufficient in reducing seepage to a safe level then alternative measures will be taken to ensure that the seepage is reduced to a level that allows a flooded tailings impoundment at all times.

SECTION X

Ref: Screening Report Section 6.5.3

LIQUEFACTION MONITORING PROGRAM

Liquefaction

It has been suggested that a combination of thawing and seepage could result in liquefaction of the dam foundation during seismic events .

Objectives

The objectives of the Seepage Monitoring Program will be:

1. to develop data concerning the performance of the dam and foundations over the three year lifetime of the structure.

2. to propose actions to be taken based on the data.

Study Methodology

The Seepage Monitoring Program will be conducted as follows:

1. Record temperatures for each of the thermistor installations to determine rate and extent of thaw.

2. Record pore pressures for each of the pneumatic piezometers in embankment and foundation zones which are unfrozen. This will assist in determining seepage through the dam and will allow measurement of actual thaw-induced pore pressures for stability assessment.

3. Record settlements of dam crest by regular surveys of settlement pins. Settlements will be correlated with the depth of thaw and pore pressure dissipation to provide a basis for future settlement estimates.

4. Record daily maximum and minimum temperatures at the Mt. Nansen site. Comparison of data at the site with similar data recorded at the Environment Canada Station at Carmacks will provide a basis for adjustment of temperature data used in long term prediction models.

5. If thawing of foundation soils occurs under the dam embankment, then test hole drilling should be carried out for measurement of SPT blow counts or cone penetration resistance. This data will allow assessment of seismic stability.

Schedule

Collection of data will begin as soon as the tailings dam stucture has been completed and filled with water and as soon as the temperature regime indicates that thawing has occured. The monitoring will then continue until freezing takes place or until closure of the mine.

The seepage performance of the dam and underlying foundation and the influence of the tailings will be monitored throughout the operational life of the impoundment to determine which long term solutions are required.

Dependant on the dam foundation performance, a downstream berm may eventually be required, however, construction of the berm can be delayed without serious ramifications until the actual performance of the dam can be monitored by the foundation instrumentation.

Report Submission

Seepage data will be submitted on a quarterly basis and summarized in the Annual Report. The final report detailing the predictions for the long term behaviour of the dam will be produced within three months of closure.

Decision Criteria

The criteria used to assess any potential problem from liquefaction will be based upon a comparison between the data collected from the instrumentation that will be installed on and in the tailings dam, and the values assumed for the purposes of predicting the dam performance. If the data indicates that the estimates made for the purposes of the dam design were not sufficient in limiting the chances of liquefaction to a safe level then alternative measures sucha as a downstream berm will be taken to ensure that the liquefaction potential is reduced to a level that is acceptable.

SECTION XI

Ref: Screening Report Section 6.7

Also Ref: Water Licence Application Section 5.9.1.4

TAILINGS ARD MITIGATION PLAN

5.9.4 Tailings ARD

The tailings from the Brown-McDade oxide ore exhibits a slightly negative Net NP indicating that it has a theoretical potential to generate acid. Based on its low sulphide content and very fine particle size, acid generation from tailings is not expected. This conclusion will require verification during operation using a larger data base than that used to complete the IEE program.

5.9.4.1 Objectives

The objective of the Tailings ARD program will be:

1) Determine the ARD characteristics of the tailings using sufficient data to assess variability and to verify the conclusion that acid generation from the tailings will not occur after closure.

2) Collect additional tailings characterization data to assist in reclamation planning.

5.9.4.2 Study Methodology

The Tailings ARD Program will be conducted as follows:

1) Composite tailings samples will be collected on a monthly basis during operation and assayed for ABA using the Modified Procedure. Analyses on all samples will include Total Sulphur, Sulphide Sulphur, Sulphate and Total Metals via Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES).

2) Variability will be assessed using frequency and cumulative distribution plots of Maximum Potential Acidity (MPA) or Percent Sulphide ($\%S^{=}$), Neutralization Potential (NP), Net Neutralization Potential (Net NP) and Neutralization Potential Ratio (NPR).

3) A kinetic humidity cell test will be conducted on a tailings composite generated after 60 days of operation. A second humidity cell test will commence after the first year of operation using a "worst case" tailings sample. This sample will consist of a composite of tailings which exhibits an elevated theoretical potential for ARD relative to the mean, (i.e. greater than 75 percentile of the group). Each humidity cell test will operate for a total of 30 weeks.

5.9.4.3 Schedule

Collection of tailings samples for ABA will commence at start-up and continue during the life of the mine. The first humidity cell test will commence 60 days after the start of milling while the second "worst case" humidity cell test will commence one year after the start of operation.

5.9.4.4 Report Submission

ABA tailings data will be submitted on monthly basis and summarized in the Annual Report. The results of the humidity cell tests will also be updated monthly with the final results submitted with 6 weeks of completion of the work.

5.9.4.5 Decision Criteria

The criteria used to assess the potential for ARD from the tailings will be based on a comparison between the data collected during operation with data used to assess ARD potential during the IEE program. If the data indicates that the tailings have a substantial potential for ARD, it will necessary to ensure that the tailings are flooded at closure. Alteratively if the tailings exhibit a low but measurable potential for ARD it may be adequate to cover the tailings at closure with non-acid materials such as overburden. The final reclamation plan will reflect the results of the tailings ARD program with respect to reclamation of the tailings impoundment.

SECTION XII

Ref: Screening Report Section 6.8

Also Ref: Water Licence Application Section 5.6

TAILINGS ARSENIC MITIGATION PLAN

5.9.5 Arsenic in Tailings

Distilled water leaching testwork has indicated that the tailings contain minor amounts of leachable arsenic. This arsenic will be stabilized using either direct ferric sulphate addition to the tailings or conventional treatment of excess tailings pond water prior to release to the environment.

5.9.5.1 Objectives

The tailings arsenic stability program will be conducted to:

1) Evaluate alternatives for stabilizing arsenic in the tailings and

2) Assess the attenuation of arsenic in the groundwater if release of contaminated seepage occurs after closure.

3) Provide information on closure options for the tailings pond.

5.9.5.2 Study Methodology

5.9.5.2.1 Tailings Stability Tests

The tailings stability tests will be as follows:

1) A 24 hour composite sample of raw un-treated tailings will be collected within 30 days of mill start-up and subjected to equilibrium tests under both mixed and un-mixed conditions.

   i) The mixed sample will consist of a 4-5 kg sample slurried to 40% solids. The slurry will be placed in a 20 L bottle and placed on roll apparatus. The slurry will be sampled and assayed for dissolved metals after 1, 3, 10 and 30 days.

   ii) The un-mixed sample will be placed in an identical stationary container and sampled and assayed as in (i) above.

2) A 24 hour composite sample of tailings treated using the Inco SO_2-Air process will be collected within 30 days of mill start-up and subjected to equilibrium tests identical to the program for untreated tailings above in 1), i and ii.

3) A sample of treated tailings will subjected to ferric sulfate addition tests as follows:

i) Ferric sulphate solution will be added to a 40% slurry of treated tailings at Fe/As ratios of 5, 10, 20 and 50 based on the soluble As concentration in the slurry. Each sample will be reacted for 10 min.

ii) After ferric sulphate addition the slurry will be neutralized to pH 7.5 with lime (if necessary) and placed on bottle roll apparatus for two 24 h distilled water leaching cycles. The slurries will be dewatered via filtration between cycles.

iii) The starting solutions and the solution after each cycle will be assayed for dissolved metals via ICP-AES.

4) The optimum ferric sulphate dosage would then be selected from the results of Item 3 and used to treat a bulk sample of treated tailings. This sample would then be subjected to equilibrium tests under mixed and un-mixed conditions as outline above in 1).

5) Assuming that work conducted as per Item 4 is successful in stabilizing arsenic in place, direct ferric sulphate addition to treated mill tailings would commence on a full scale basis. Samples of final tailings slurry after ferric sulphate addition would then be collected at 1, 3, 7 days and then weekly for a one month period to verify that arsenic was being fully stabilized. These samples would be subjected to 24h distilled water leaching with the solutions assayed for dissolved metals via ICP-AES. Sampling and assaying of final treated mill tailings for soluble arsenic would continue monthly using the samples collected for ABA assays described in Section 3.0.

5.9.5.2.2 Groundwater Attenuation

Evaluation of arsenic attenuation in the ground would be conducted as follows:

1) A large sample of native soils and materials would be collected downstream of the impoundment. Sieve analyses would then be conducted to determine particle size distribution.

2) This native material would be placed in a 100 mm to 150 mm diameter column to a bed depth of 3 m. A synthetic tailings reclaim solution containing soluble arsenic at 5 mg/L would then be fed to the column at a rate of 0.2 to 1.0 $L/m^2/min$.

3) The column leachate would be collected after 1, 3, 7 days and then weekly and assayed for dissolved metals via ICP-AES. The test would be terminated after 10 weeks.

5.9.5.3 Schedule

The tailings stability tests would commence within 30 days of mill start-up. Once direct ferric sulphate addition to the tailings has been demonstrated on a bench basis, full-scale implementation would commence - potentially within 60 days of mill start-up.

The groundwater attenuation program would commence within three months of start-up once the reclaim water has reached equilibrium with the tailings.

5.9.5.4 Report Submission

A report on work items listed in part of 4.1.1 sections 1), 2) and 3) above be completed within 30 days of completion of test program - approximately 60 days after mill start-up.

The report for work outlined in 4.1.2 would be issued 30 days after completion of the work - approximately 7 months after mill start-up.

5.9.5.5 Decision Criteria

The feasibility of direct ferric sulphate addition as a means of stabilizing arsenic in the tailings will assessed on the following factors:

1) The process successfully stabilizes arsenic and prevents it from re-solubilizing in the longer term tests outlined in Section 4.1.1 Item 4) above.

2) The full-scale trial as outlined Section in 4.1.1 Item 5) demonstrates that full scale implementation is feasible.

If direct sulphate addition is not feasible, it will be necessary to install a secondary system for treatment of reclaim water as described below.

SECTION XIII

Assuming arsenic is present in the reclaim above discharge limits, a series bench tests will be conducted to evaluate the removal of arsenic using the ferric sulphate - high density sludge process. These tests will consist of batch tests to select optimum dosages and pH conditions followed by continuous tests using a bench scale piloting system to simulate the high density sludge process.

5.5.1.2 Schedule

The bench tests will commence once the tailings pond Collection of tailings samples for ABA will commence at start-up and continue during the life of the mine. The first humidity cell test will commence 60 days after the start of milling while the second "worst case" humidity cell test will commence one year after the start of operation.

5.5.1.3 Report Submission

ABA tailings data will be submitted on monthly basis and summarized in the Annual Report. The results of the humidity cell tests will also be updated monthly with the final results submitted with 6 weeks of completion of the work.

5.5.1.4 Decision Criteria

The criteria used to assess the potential for ARD from the tailings will be based on a comparison between the data collected during operation with data used to assess ARD potential during the IEE program. If the data indicates that the tailings have a substantial potential for ARD, it will necessary to ensure that the tailings are flooded at closure. Alteratively if the tailings exhibit a low but measurable potential for ARD it may be adequate to cover the tailings at closure with non-acid materials such as overburden. The final reclamation plan will reflect the results of the tailings ARD program with respect to reclamation of the tailings impoundment.

SECTION XIV

Ref: Screening Report Section 6.11

Also Ref: Water Licence Application Section 3.3.3.7

WATER BALANCE

3.3.3.7.1 Hydrology

B.Y.G. agrees that commitments regarding site hydrology will be incorporated into the water licence. Site specific data, as listed in Section 3.5.1 of the Application Report, will be collected to revise the water balance on an annual basis. The revised balance will be used to predict when a discharge of excess water would occur. A Water Balance Contingency Plan will be prepared and submitted to the Water Board as a condition of the Water Licence. The Water Balance Contingency Plan would be submitted to the Board one year after commencement of operation. Implementation of the Contingency Plan would be triggered by revised water balances that predicted a need to release excess water ahead of schedule.

7. Hydrology

B.Y.G. agrees that commitments regarding site hydrology will be incorporated into the water licence. Site specific data, as listed in Section 3.5.1 of the Application Report, will be collected to revise the water balance on an annual basis. The revised balance will be used to predict when a discharge of excess water would occur. A Water Balance Contingency Plan will be prepared and submitted to the Water Board as a condition of the Water Licence. The Water Balance Contingency Plan would be submitted to the Board ~~one year after commencement of operation.~~ By DEC 31 1997. Implementation of the Contingency Plan would be triggered by revised water balances that predicted a need to release excess water ahead of schedule.

SECTION XV

Yukon

Tourism
Box 2703, Whitehorse, Yukon Y1A 2C6
Heritage Branch

Our File: 4051-11-17
Your File:

August 18, 1995

Mr. J.B. Smith
VP Operations, Chief Operations Officer
BYG Resources Inc.
801 - 602 W. Hastings Street
Vancouver, B.C.
V6B 1P2

RE: VICTORIA CREEK CROSSING - ARCHAEOLOGICAL ASSESSMENT

The area of the Victoria Creek crossing was inspected Heritage Branch staff on August 15, 1995, as a component of the archaeological impact assessment of planned minor improvements to the Nansen Creek Trail carried out at the request of the Government of Yukon Community and Transportation Services, Transportation Engineering Branch.

Our inspection was confined to the area within about 100 to 150 m north of the present ford on Victoria Creek, on both sides of the creek. Traditional used was noted on the east bank of Victoria Creek in the form of an old foot trail which follows the creek bank, and by a brush camp. These features were recorded. There are no further heritage resource concerns with regards to a bridge location within this area.

While we were in the vicinity, we drove to the Mt. Nansen mining camp to arrange a meeting with Mr. Hinkkuri. Although Mr. Hunkkuri was out of the camp at the time, the location of the tailings pond was pointed out to us by one of the mine workers. Archaeological potential of this location was judged to be very low. No further heritage resources assessment work is required for this area.

Please do not hesitate to contact me at (403) 667-5983 if you require clarification on any of the above.

Ruth Gotthardt
Archaeology

c. Dan Adam, Environment Assessment Officer, Environment Directorate, DIAND

SECTION XVI

Ref: Screening Report Section 6.12.2

VICTORIA CREEK CROSSING (culvert redesign- baseline data)

KLOHN-CRIPPEN

Our File: PM 5314.07.01(.101)
5314-kr.007

November 13, 1995

B.Y.G. Natural Resources Inc.
208 - 3190 St. John Street
Port Moody, British Columbia
V3H 2C7

Mr. Jim Smith
Vice-President

MT. NANSEN MINE
PRELIMINARY DESIGN OF PROPOSED VICTORIA CREEK CROSSING

Dear Mr. Smith:

A conceptual design for this crossing was submitted on April 11, 1995. This current review updates the earlier design, taking into consideration comments received from various agencies and the additional topographic information obtained by BYG in August 1995. The major modification is an increase in culvert size to accommodate peak flows in the order of a 10-year flood.

The site is located on the Mt. Nansen Road approximately 57 km west of Carmacks in the Yukon Territory. At present, the road fords the creek and the water depth is typically less than 150 mm. The road is used by prospectors and miners in the area and traffic is estimated to be about twenty vehicles per day. This will increase when the new mine is developed.

At the existing ford, the floodplain is about 40 m wide and comprises mainly granular material. The creek channel is approximately 10 m wide. The remains of an earlier embankment crossing can be seen immediately upstream of the present ford. The earlier crossing was apparently constructed in the 1960's and was not intended to be a permanent structure.

From the review of documented comments on our earlier letter report and discussions with Mr. Wally Hidinger (Yukon Community and Transportation Services), the following preliminary design parameters are recommended:

- new crossing should be capable of passing peak flows in the order of a 10-year flood;
- new crossing must not impede fish migration;
- road surface should be two lanes with a minimum width of 8 m plus 0.5 m wide shoulders; and
- CSA S600 highway loading.

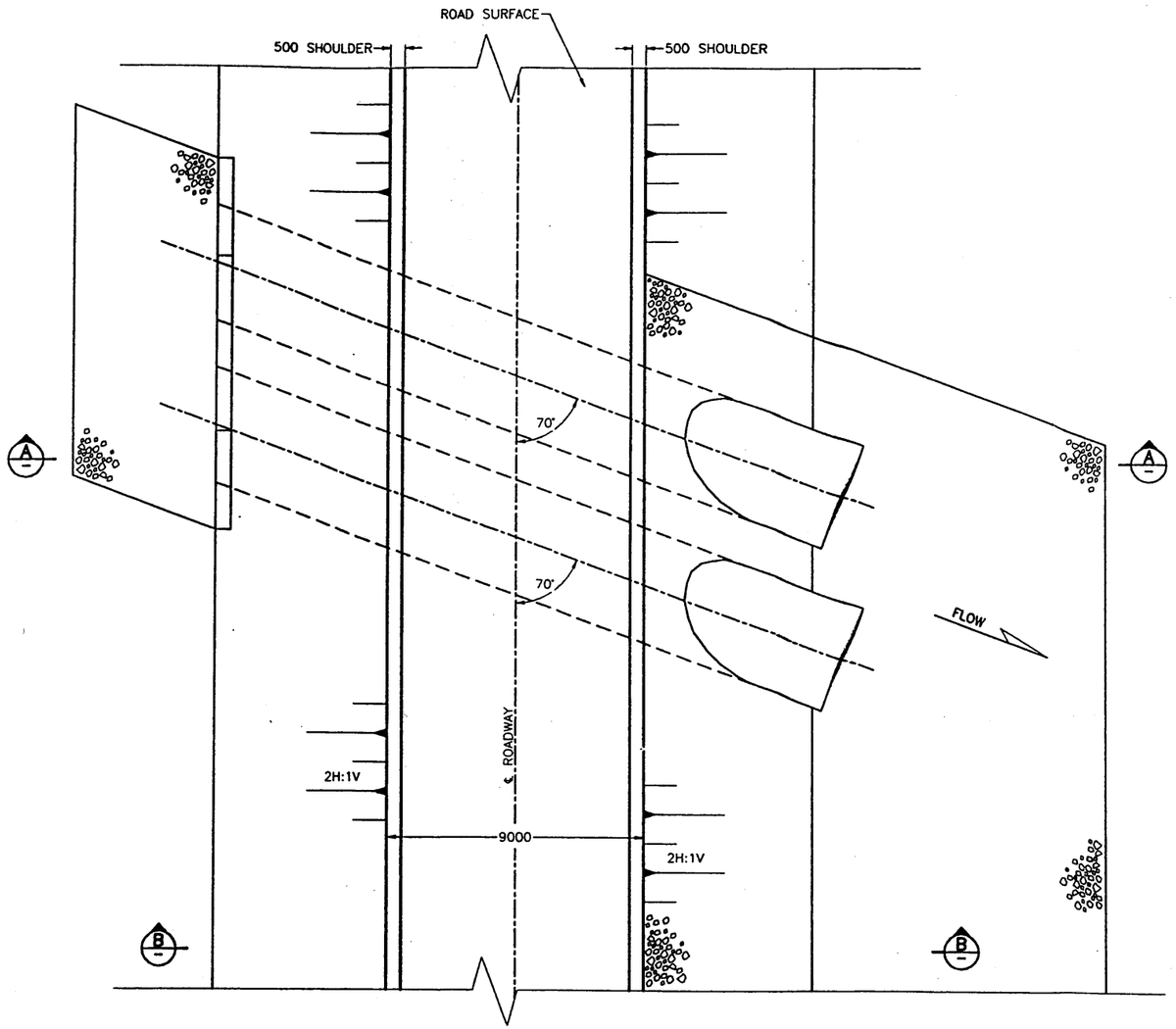
Mr. Hidinger also suggested that a 600 mm to 900 mm diameter culvert be provided above the main culverts. At this time, Mr. Hidinger cannot confirm if provision for heat tracing is required for the main culverts.

The hydrology is described in an earlier letter report dated April 11, 1995. The total drainage area at the crossing is approximately 62 km^2 and the estimated peak flow for the 10-year flood is about 27 m^3/s. This estimated peak flow was based on data at Carmacks. Adjusting for the difference in elevation between the site and Carmacks would have resulted in a higher flow estimate. However, based on the experience of the Yukon Community and Transportation Services, the design flow appears to be conservative. In view of this local experience, the elevation adjustment was not considered to be necessary and we have used a peak flow of 27 m^3/s to size the pipe-arch culvert for the current study. In addition, a 900 mm culvert (above the main culverts) and a lower overflow section have been incorporated into the road embankment to handle flows in excess of the estimated value.

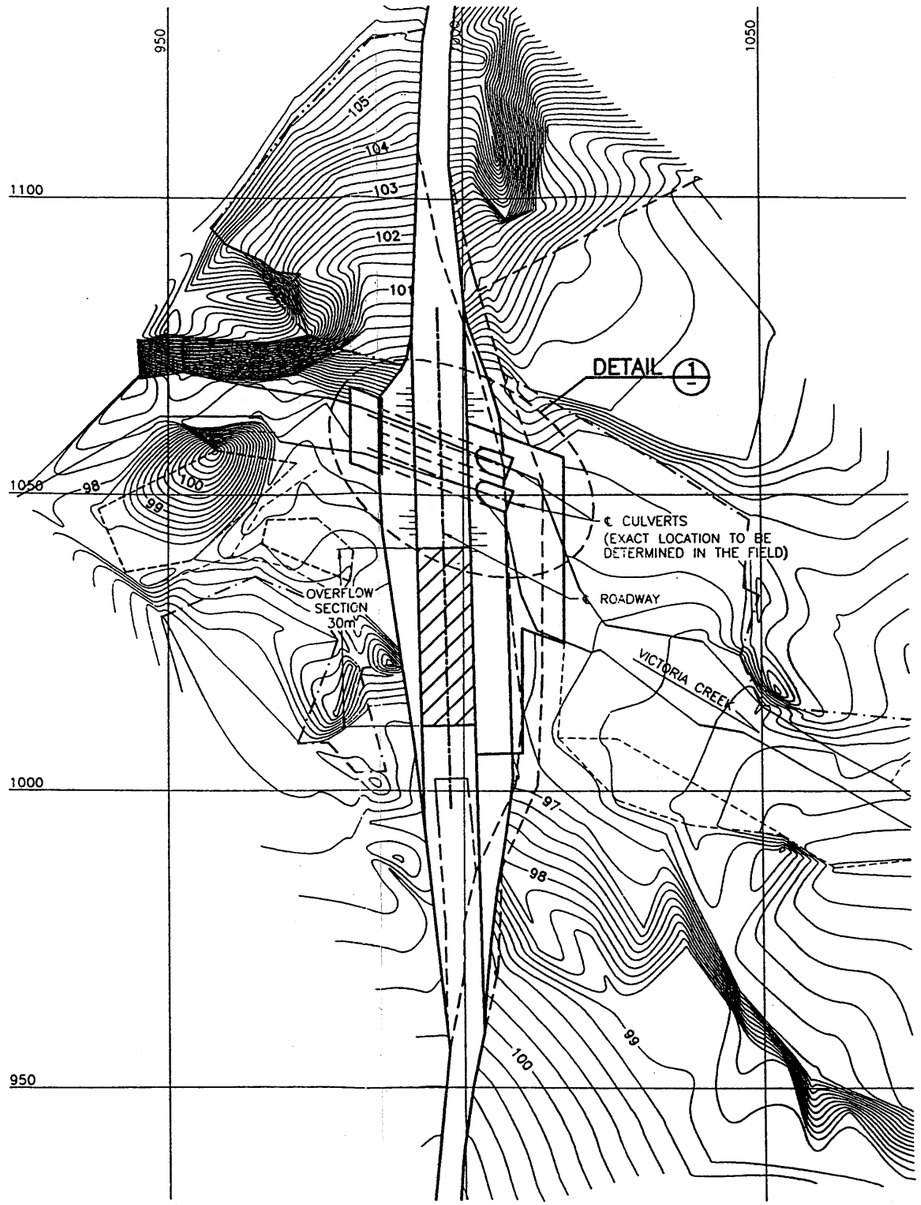
The proposed crossing, which includes an embankment with one or more culverts, was presented in our earlier report. To minimize the likelihood of blockage from ice and debris (brush and trees), it is preferable to maximize culvert dimensions (and keep the number to a minimum). Circular and pipe-arch cross-sections are acceptable.

The main features of the proposed culvert crossing, which is shown on Drawings B-5314-07-001 and -002, are:

- two 3730 mm x 2290 mm corrugated steel pipe-arch culverts to pass the estimated 10-year flood peak flow;
- one 900 mm corrugated steel pipe emergency culvert for passing flows in the event that the main culverts are blocked;
- granular embankment, approximately 3 m high, with a top width of 9.0 m, 2:1 side slopes and riprap slope protection on the downstream face; and
- a lower overflow section of embankment, 30 m wide, to pass flows in excess of the estimated 10-year flood.



DETAIL 1
SCALE A



SITE PLAN
SCALE B

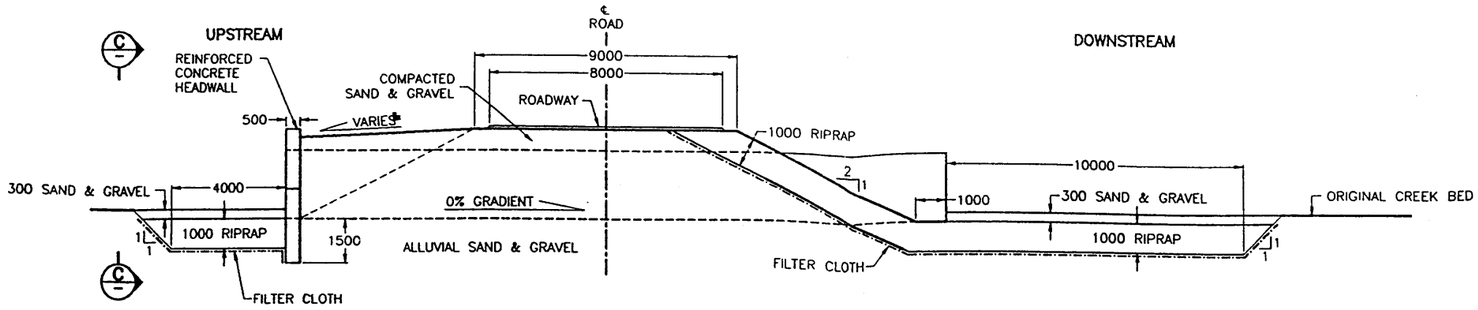
(1:2000) 0 20 40m (SCALE B)
(1:200) 0 2 4m (SCALE A)

NOTES:
1. MAPPING FROM TOPOGRAPHIC SURVEY BY LAMERTON & ASSOCIATES IN AUGUST 1995.
2. COORDINATES AND DATUM ARE ASSUMED.

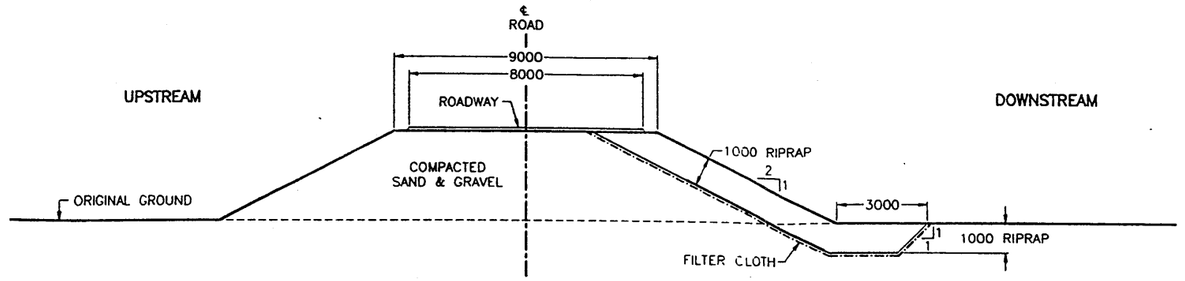
TO BE READ WITH KLOHN CRIPPEN REPORT DATED NOV/95

SCALE: AS SHOWN	REV. / DATE / REVISION DETAILS	
KLOHN-CRIPPEN	DESIGN	DRAWN: C. P. B. DATE: NOV 1995 SCALES
	PROJECT: MT. NANSEN GOLD PROJECT	
	TITLE: PRELIMINARY DESIGN OF VICTORIA CREEK CROSSING CULVERTS – SITE PLAN	
CLIENT: B.Y.G. NATURAL RESOURCES INC.	DATE OF ISSUE: NOV 1995 / APPROVED	PROJECT No.: PM 5314 / DWG. No.: B-5314-07-001 / REV.

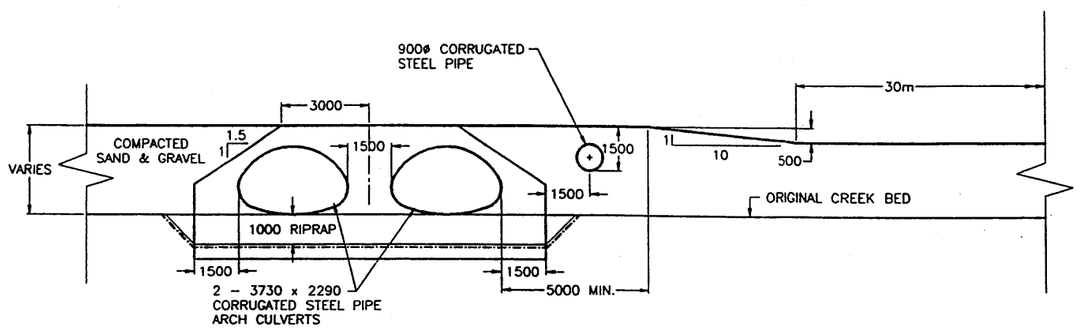
5314s0045.dwg



SECTION (A) 001
SCALE A



SECTION (B) 001
SCALE A



SECTION (C)
SCALE A

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

(1:200) 0 2 4m (SCALE A)

TO BE READ WITH KLOHN CRIPPEN REPORT DATED NOV. 95

SCALE: AS SHOWN	REV.	DATE	REVISION DETAILS
	DESIGN	DRAWN C. P. B.	DATE NOV 1995
KLOHN-CRIPPEN	PROJECT MT. NANSEN GOLD PROJECT		
	TITLE PRELIMINARY DESIGN OF VICTORIA CREEK CROSSING CULVERTS – DETAILS		
CLIENT: B.Y.G. NATURAL RESOURCES INC.	DATE OF ISSUE NOV 1995	PROJECT No. PM 5314	DWG. No. B-5314-07-002
	APPROVED		

5314e045.dwg

To facilitate fish passage, the culverts are horizontal and the invert has been set 300 mm below the present creek bed. The riprap will be sized in final design to minimize scour at the culvert outlets.

The embankment for the proposed crossing can be constructed from locally available sand and gravel. For this preliminary study, it has been assumed that the riprap layer will be 1000 mm thick. We recommend that a proper filter be provided to prevent the migration of fine material from the embankment through the riprap. The filter could consist of a geotextile fabric or a well-graded mixture of sand and gravel. Riprap and filter requirements parameters will be determined as part of final design.

Final design of the crossing and detailed specifications will be provided once approval for the crossing is received.

We trust that this report meets your current requirements. Please contact either of the undersigned if you have any comments or require additional information.

Yours very truly,

KLOHN-CRIPPEN CONSULTANTS LTD.

Roger Kitchin, P.Eng.
Director, Water Resources Division

Bill G. Chin, P.Eng.
Project Manager

RFK/BGC/sh
Attachments

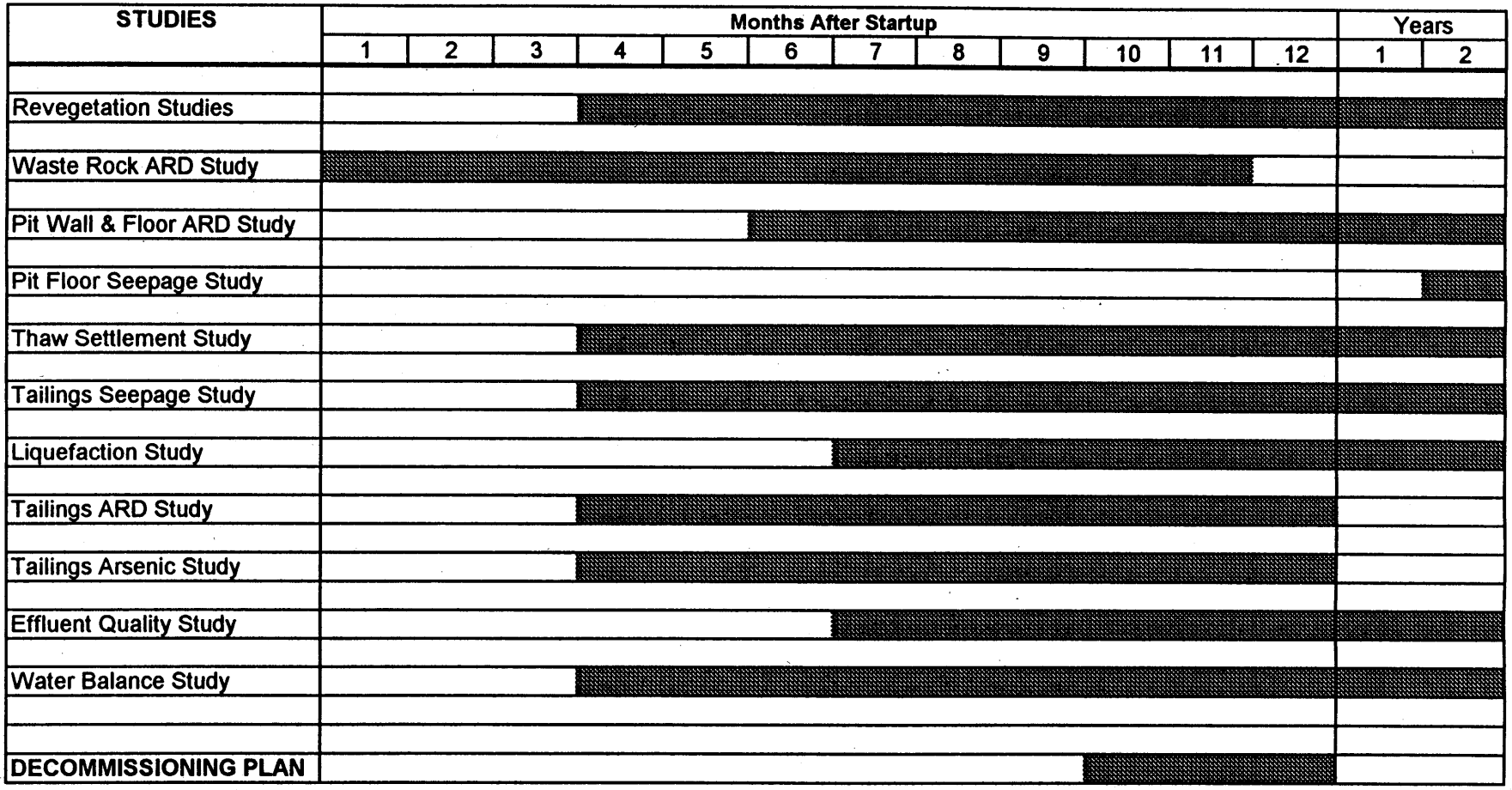
SECTION XVII

Ref: Screening Report Section 6.13

Also Ref: Water Licence Application Section 3.6

DECOMMISSIONING PLAN SCHEDULE

DECOMMISSIONING PLAN SCHEDULE



SECTION XVIII

Ref: Screening Report Section 6.15

Also Ref: Water Licence Application Section 3.6.19
and Appendix B

SECURITY DEPOSIT

FINANCIAL SECURITY

Section 3.6.19 of the Water License Application Report proposes a schedule of reclamation for purposes of providing financial security and the posting of a bond.

This work has been reviewed, and a new Schedule of Reclamation Costs Incurred and Expenditures Made is attached.

BYG now propose to post a bond of $200,000 prior to production start-up, increasing to $325,000 end of year 1, and peaking at $350,000 end of year 2.

BYG also propose that the pre-production bonding be submitted in two stages, $25,000 within 30 days of receiving an approved Water License, the balance of $175,000 submitted prior to production start-up.

Nov. 30, 1995

B.Y.G. NATURAL RESOURCES INC.

WATER LICENSE APPLICATION – MT.NANSEN PROJECT

SCHEDULE OF RECLAMATION COSTS INCURRED AND EXPENDITURES MADE

		SCHEDULE OF RECLAMATION COSTS INCURRED					
	TOTAL COST	EXISTING	BEFORE STARTUP	END YEAR 1	END YEAR 2	END YEAR 3	AT CLOSURE
(1) Existing construction areas	$59,325	$59,325	$0	$0	$0	$0	
(2) Existing roads	$13,395	$13,395	$0	$0	$0	$0	
(3) Existing trenches	$45,600	$45,600	$0	$0	$0	$0	
(4) Existing mine portals	$51,000	$51,000	$0	$0	$0	$0	
(5a) Existing frame buildings	$35,000	$35,000	$0	$0	$0	$0	
(5b) Existing steel buildings	$105,000	$105,000	$0	$0	$0	$0	
(6) Existing dams	$11,100	$11,100	$0	$0	$0	$0	
(7) Existing ore dumps	$155,875	$155,875	$0	$0	$0	$0	
(8) Existing waste dumps	$28,125	$28,125	$0	$0	$0	$0	
TOTAL OF EXISTING IMPACTS	$504,420	$504,420	$0	$0	$0	$0	
(9) Open Pit	$3,600	$0	$1,200	$1,200	$1,200	$0	
(10) Waste Dump	$31,000	$0	$10,333	$10,333	$10,333	$0	
(11) Tailings Impoundment	$125,000	$0	$125,000	$0	$0	$0	
(12) Seepage Pond	$4,200	$0	$4,200	$0	$0	$0	
(13) Dome Creek diversion	$3,000	$0	$0	$3,000	$0	$0	
(14) Pit access road	$6,600	$0	$6,600	$0	$0	$0	
(15) Tailings Dam Access road	$1,650	$0	$1,650	$0	$0	$0	
(16) Water, power lines	$39,500	$0	$39,500	$0	$0	$0	
(17) New trailers	$10,000	$0	$10,000	$0	$0	$0	
TOTAL OF NEW IMPACTS (WATER LICENSE)	$224,550	$0	$198,483	$14,533	$11,533	$0	
(18) Cost annual inspections	$50,000	$0	$0	$50,000	$0	$0	
(19) Water quality monitoring	$10,000	$0	$0	$10,000	$0	$0	
(20) Remove contaminated soils	$20,000	$0	$0	$20,000	$0	$0	
(22) Final reclamation supervision	$25,000	$0	$0	$25,000	$0	$0	
ADDITIONAL (NOV.95) IMPACTS	$105,000	$0	$0	$105,000	$0	$0	
TOTAL RECLAMATION INCURRED	$833,970	$504,420	$198,483	$119,533	$11,533	$0	
TOTAL BONDED RECLAMATION INCURRED	**$329,550**	**$0**	**$198,483**	**$119,533**	**$11,533**	**$0**	
RECLAMATION WORK–EXISTING IMPACTS				$30,000	$175,000	$125,000	$174,420
RECLAMATION WORK–NEW IMPACTS				$0	$10,000	$10,000	$309,550
STATUS OF RECLAMATION COSTS AT END OF PERIOD		$504,420	$702,903	$792,436	$618,970	$483,970	($0)
STATUS OF RECLAMATION LIABILITY AT END OF PERIOD		$0	$198,483	$318,016	$319,550	$309,550	($0)