

24 Hour Baffinland Contact:

403-450-7317

or

647-723-2069

Spill Contingency Plan
Mary River Project

Presented to:



Prepared by:



August 2007

Revision 1 (March 2008)

PREAMBLE

This Emergency and Spill Response Plan for the Mary River Project is in effect since commencement of the program, and applies to all licensed elements of the program.

The Plan will be updated and revised as necessary during the course of the Bulk Sample Program and Exploration Project.

Formal distribution of the Plan has been made to:

Department of Environment - Environmental Protection Division
PO Box 1000 Station 1300
Iqaluit, NU, Canada
X0A 0H0
Tel: (867) 975-7700, 1-866-222-9063
Fax: (867) 975-7742

Department of Fisheries and Oceans - Central and Arctic Region
501 University Crescent
Winnipeg, MN, Canada
R3T 2N6
Tel: (204) 983-5000
Fax: (204) 984-2401

Hamlet of Pond Inlet
PO Box 180
Pond Inlet, NU, Canada
X0A 0S0
Tel: (867) 899-8934
Fax: (867) 899-8940

Indian and Northern Affairs Canada - Nunavut Regional Office
Land Administration Division
PO Box 2200
Iqaluit, NU, Canada
X0A 0H0
Tel: (867) 975-4280 (Land Administration Manager)

Indian and Northern Affairs Canada - Nunavut Regional Office
Water Resources Division
PO Box 2200
Iqaluit, NU, Canada
X0A 0H0
Tel: (867) 975-4550 (Water Resources Manager)

Mittimatalik Hunters and Trappers Organization

PO Box 189
Pond Inlet, NU, Canada
X0A 0S0
Tel: (867) 899-8856
Fax: (867) 899-8095

Nunavut Impact Review Board

PO Box 1360
Cambridge Bay, NU, Canada
X0B 0C0
Tel: (867) 983-4600, 1-866-233-3033
Tax: (867) 983-2594

Nunavut Water Board

PO Box 119
Gjoa Haven, NU, Canada
X0B 1J0
Tel: (867) 360-6338
Fax: (867) 360-6369

Qikiqtani Inuit Association

PO Box 1340
Iqaluit, NU, Canada
X0A 0H0
Tel: (867) 979-5391, 1-800-6672742 (Land Administrator)
Fax: (867) 979-3238

Additional copies and updates of this Plan may be obtained from:

Baffinland Iron Mines Corporation

Suite 1016, 120 Adelaide Street West
Toronto, ON, Canada
M5H 1T1
Tel: (416) 364-8820
Fax: (416) 364-0193

Qikiqtaaluk Environmental Inc.

Att. Philippe Simon, Ph.D., P.Eng.
3333 Queen Mary, suite 580
Montréal, QC, H3V 1A2
psimon@genv.ca

Track Changes Table

Revisions to the August 2007 Spill Contingency Plan were made to address some comments made by reviewers and to reflect routine updates learned from experience.

Revision 1: March 2008

Modifications/Additions	Where they appear in the document	
	section	Page number
Project activities were added for the plan to be applicable to all Baffinland projects, not just the Bulk Sampling.	1	1
Section 1.1 was added to provide a reference to Baffinland Oil Handling Facility – Oil Pollution Emergency Plan	1.1	3
Table 1 was updated to include the planned fuel storage at the Rail camp and Steensby camp.	2.1	4
A note stating that fuel trucks contain spill kits was added.	2.1	5
A note that fuel caches will be inspected was added.	2.1	5
Contact information for team members was updated.	3	8
Additional tasks for on-site coordinator (pictures, accident investigation) were added.	3	8
Add QIA Lands administrator contact number for reporting.	3	9
Add additional duties to Operations manager and Environmental Superintendents for reporting.	3	9
Scenario 3 of the previous version was removed since it added confusion and also because no fuel storage is present at the Mary River crushing area.	7 – Scenario #3	18
A note explaining the role of the first responder was added.	7 – Scenario #3	18
A scenario involving sewage was added.	7 – Scenario #4	19
Names and coordinates of other QIA and INAC representatives were added.	8	20
Additional reporting requirements were added.	8	21
Maps in appendix B have been modified and now show all existing fuel storage and spill kits locations.	Appendix B	
An emulsion explosives was added to the list of hazardous material used on site.	Appendix D	

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1. General

The spill emergency plan (Plan) was developed to assist in implementing measures to protect the environment and minimize impacts from spill events. It provides precise instructions to guide all personnel in emergency spill response situations. The Plan outlines procedures for responding to spills while minimizing potential health and safety hazards, environmental damage, and clean up costs.

This Plan is required as part of Baffinland's Mary River Project. Prior to full mining operations, a bulk sampling program and a geotechnical program is proposed over a 20-month period (approximately commencing mid-2007 to October 2008) and will involve the following activities for which some are already completed:

- Upgrade of the existing Milne Inlet tote road to allow all-weather use, including the quarrying and placement of fill on the road bed and the replacement/installation of a large number of culverts at watercourses;
- Construction of an additional 100-person all-weather tent camp at Mary River (completed), next to Baffinland's existing seasonal exploration camp;
- Establishment of temporary trailer camps at Milne Inlet (completed) and part way along the Milne Inlet tote road;
- Establishment of temporary fuel storage facilities at Milne Inlet (completed), the roadside (Midway) camp, the rail camp, the Steensby camp and at Mary River;
- The delivery of contractor mining and crushing equipment, camp materials and fuel in 2 or 3 ship voyages to Milne Inlet in August 2007, in accordance with standard northeast arctic sealift procedures, using standard sealift ships based in the vicinity of Montreal;
- The drilling, blasting and storing of approximately 169,000 dry tonnes (t) of weathered surface rock on the top of Deposit No. 1 at Mary River;
- The drilling, blasting, hauling and crushing of 250,000 t of iron ore bulk sample from Deposit No. 1 at Mary River;
- The temporary stockpiling of the iron ore bulk sample at Milne Inlet;
- The removal of barrels and debris left from historical activities in the 1960's at Milne Inlet to a landfill site near the Mary River camp;
- The loading of iron ore at Milne Inlet on ships.
- The installation of a 40 man camp at Steensby Inlet to support the geotechnical drill program, port infrastructure, environmental and hydro-electric studies.
- The installation of a rail camp for approximately 40 man half way between Steensby Inlet and Mary River to support the geotechnical drill program and environmental studies.

The Mary River Iron Mine site is located in the northern part of Baffin Island, Nunavut (71° 18' 30" North, 79° 23' 30" West), approximately 156 km south of Pond Inlet. The mine site is approximately 85 km inland and accessible by road from the sealift supply site (i.e., Milne Inlet site) located where Phillips Creek discharges into Milne Inlet. The Milne Inlet site is located on the north-eastern coast of Baffin Island (71° 52' 57" North, 80° 53' 51" West), approximately 131 km south-west of Pond Inlet. The Steensby Inlet is located on the south side of Mary River.

The spill emergency plan is implemented to ensure that Baffinland respects all applicable laws, regulations and requirements from federal and territorial authorities. Baffinland obtained and complies with all required permits, approvals and authorizations required for the operations. The following applicable Regulations and documents constitute an integral part of the spill contingency plan:

The Canadian Environmental Protection Act controls hazardous substances from their production and/or import, their consumption, storage and/or disposal.

The federal Fisheries Act protects fish and their habitat from pollution and disturbances. Fisheries and Oceans Canada reviews permit applications and restoration plans submitted by other agencies.

The federal Transportation of Dangerous Goods Act and Regulations ensure the protection of public health and safety, and the environment during the handling and transport of dangerous goods. The Regulations apply to all modes of transportation, by road, by sea, and by air.

The federal Territorial Land Use Regulations define regulatory measures to maintain appropriate environmental practices for any land use activities on territorial lands that are under the control, management and administration of the Crown. These regulations require that land use permits be issued for operations such as mineral exploration and mining.

The Guidelines for Preparation of Hazardous Material Spill Contingency Plans describe parameters that should be considered in the development of hazardous material spill emergency plans. It also defines the information that should be incorporated into a comprehensive contingency plan.

The CCME Code of Practice for Used Oil Management defines appropriate environmental options for handling, storage, collection, recycling, transport, reuse and/or disposal of used oils in Canada. It helps regulatory authorities formulate provincial and/or regional strategies for used oil management.

The Nunavut Environmental Protection Act governs the protection of the environment from contaminants. The act defines offences and penalties as well as the powers of government inspectors.

The Nunavut Spill Contingency Planning and Reporting Regulations describe requirements for spill reporting and emergency planning.

The Field Guide for Oil Spill Response in Arctic Waters developed for the Emergency Prevention, Preparedness and Response Working Group, describes precise response methods and strategies for emergency response operations and provides technical support documentation.

The Land Transportation Emergency Response Guideline for Petroleum Spills developed by the Canadian Petroleum Products Institute outlines scope, emergency response code of practice, response time guidelines, response equipment and personnel capability requirements.

1.1 Links to Baffinland Oil Handling Facility – Oil Pollution Emergency Plan

The Canada Shipping Act (CSA), as amended by Chapter 36, stipulates that operators of designated oil handling facilities must have an on-site oil pollution emergency plan.

Marine spills at the Milne Inlet Port Site are specifically addressed in the Baffinland Oil Handling Facility – Oil Pollution Emergency Plan (OPEP) which is a separate document. The Milne Inlet Fuel Storage Facility OPEP has been designed specifically to compliment this document. The OPEP is not to be construed as to supersede existing contingency plans, rather it is conceived to address the specifics of the fuel storage facility, the bulk incoming transfer of fuel and spill scenarios directly relating to this operation.

The Milne Inlet Fuel Storage Facility, Oil Pollution Emergency Plan takes into account the requirements of the CSA 2001, part 8, subsections 168. (1), 168. (2) and 168. (3). Although the subsection 168 (2) is applicable, as the Milne inlet site is located North of 60°, therefore the subsections 168. (1) (a), 168. (1) (b) (ii), 168. (1) (b) (iii) do not apply.

The Canada Shipping Act Response Organizations and Oil Handling Facilities Regulations (SOR/95-405) applies.

The Oil Handling Facilities Standards, TP12402 applies.

2. Hazardous Materials – Transport and Storage

A variety of petroleum products and other hazardous materials is used as part of the mining operations. Large quantities of petroleum products are stored at various sites. Explosives are also stored on site. Other hazardous materials are also used but in smaller quantities. Nonetheless, all these products are considered as potential environmental and safety hazards. The material safety data sheets (MSDS) of all these products are presented in Appendix D.

2.1 Fuel

Table 1 presents the approximate quantities of petroleum products that will be present on site, as well as their location.

Table 1: Fuel Storage Capacity (litres)

1) Milne Inlet Site		Type and number of containers
diesel fuel	7,722,080	71 x 113,560-L fuel bladders
jet A-1 fuel	454,240	3 x 113,560-L fuel bladders 2000 x 200-L drums
2) Midway Camp (emergency use only)		
diesel fuel		No fuel at Midway camp
3) Mary River Site		
3.1) Mary River Camp		
diesel fuel	1,250,000	12 x 113,560-L fuel bladders 1000 x 200 L drums 1 Envirotank (75,000 liters) in lined containment
jet A-1 fuel	500,000	4 x 113,560-L fuel bladders 2000 x 200-L drums
3.2) Crushing and Screening Area		
diesel fuel		No fuel at crushing area
4) Rail Camp		

diesel fuel	20,000	1000 x 200-L drums
jet A-1 fuel	20,000	1000 x 200-L drums
5) Steensby Inlet Camp		
diesel fuel	40,000	2000 x 200-L drums
jet A-1 fuel	40,000	2000 x 200-L drums

Fuel is delivered in bulk by sealift to the Milne Inlet site. From there, the fuel is hauled to the Mary River site by tanker trucks on a 100-km all-season road. Tanker trucks are equipped with emergency spill response kits. Otherwise, for the Rail Camp and Steensby Camp, drums will be supplied by sealift in the fall of 2008 as well as shuttled by aircraft from Mary River.

A map of the regional area and layouts of the four (4) main fuel storage locations (i.e., Milne Inlet, Mary River Camp, Rail Camp and Steensby Inlet) are presented in Appendix B. Appendix B also provides the location of all fuel containers and spill kits as of February 2008. The Milne Inlet tank farm is located approximately 500 m from the ocean, however the fuel intake line is located at the high-water mark. The Mary River Camp tank farm is located approximately 400 m from the nearest lake. The Stockpile Area tank farm is located approximately 700 m east of a large lake and approximately 800 m north of a smaller lake, both of which discharge into the Mary River.

Each tank farm facility consists of 113,560-litre fuel bladders inside a lined containment area. The fuel cache located at Rail Camp and Steensby consists of drums inside a lined containment area. In addition, smaller drum caches in lined containment areas are situated at Milne Inlet and Steensby Inlet to support geotechnical drilling operations. All fuel caches are clearly identified, marked, and protected to prevent damage to drums from vehicles and heavy equipment especially during periods when the drums may be less visible (i.e., at night and during winter).

Refuelling stations at the Milne Inlet and Mary River sites are equipped with a lined and bermed area to contain any minor spills or leaks during refuelling. The liner (40 mil hypolon liner) is protected by sand bedding and vehicles and equipment drive onto the lined area to refuel. Transfer of fuel from supply vehicles to tanks and from tanks to vehicular equipment is performed with the aid of fuel pumps.

A variety of intermediate-sized fuel tanks are also used to supply generators (camps and operations) and furnaces. Large fuel caches in excess of 20 drums are inspected daily. Logs of inspection are kept in files.

Emergency spill response equipment (i.e., spill kits) are installed at each fuel storage location. All spill kits contain the appropriate type, size and quantity of equipment for the volume and type of product present at the storage location as well as the environment likely to be affected by a spill (i.e., ground, lake, river, ocean).

2.2 Chemicals

Other chemicals and potentially hazardous materials associated with project operations include:

- Petroleum oils and lubricants for mining and heavy equipment;
- Drilling additives;
- Calcium chloride flakes for drill water;
- Lead acid batteries;
- Cleaning supplies at camp sites;
- Waste oil from equipment and generators.

Lubricants, oils, and batteries, are stored in containers at the work shop and at other work areas. Waste oils are stored in drums in lined containment, and may be used to fuel the camp incinerator. The calcium chloride storage area is located adjacent to the airstrip and camp at the Mary River site.

2.3 Explosives

Approximately 240 M.T. of pre-packaged emulsion and high explosives (Class A) are used at the bulk sample location. The explosives are stored in the 16 explosives magazines used for transport of the explosives to the Mary River site. The explosives magazines are positioned in accordance with the Nunavut Mine Health and Safety Act and Regulations. Detonators and explosives are stored in separate magazines, and inventory is strictly controlled with supervisory control. The explosives magazines is located at a minimum distance of 600 m away from other infrastructure (e.g., building or work area) in accordance with the requirements of the Explosives Use Act, and warning signs are prominently posted. The explosives magazines will be located approximately 1,200 m away from the Stockpile Area tank farm.

3. Duties and Responsibilities

As part of the spill emergency response plan, Baffinland is responsible for implementing, through its project management team, the following procedures:

- Train site personnel in spill response procedures and the proper use of response equipment and materials.
- In the event of a spill, mobilize all available site personnel, equipment and tools, as required.
- Implement all required health and safety procedures at the site of the spill.
- Eliminate all fire hazards and potential ignition sources near the spill area.
- Control the source of the spill (i.e., reduce or stop product discharge).
- Contain the spilled product using the most appropriate methods and equipment (i.e., dykes, ditches, sorbent materials, containment booms, and other barriers).
- Evaluate the possibilities of recovering spilled materials.
- Obtain, if required, assistance from government agencies such as Environment Canada, the Canadian Coast Guard and/or Fisheries and Oceans Canada.
- Obtain, if required, additional assistance by hiring local rangers or residents from the nearest communities and/or firms specialized in spill response operations.
- Comply with all applicable guidelines and regulations.
- Conduct a preliminary assessment of environmental impacts to marine, freshwater and terrestrial ecosystems and natural resources.
- Report the spill to the Government of Nunavut Spill Report Line, to QIA, and to the water license inspector within 24 hours of the event, and submit a written spill report using the appropriate form (see below for the list of information required in the report).

Table 2 presents the management team responsible for overseeing emergency spill response operations and their contact information.

Table 2: Project management team members and contact information

Position	Contact
Kevin Mealey On-site Co-Coordinator	Mary River Site Tel: 403-450-7312 (24hrs) Milne Inlet Site Tel: 647-723-2077 (24 hrs) Email: kevin.mealey@baffinland.com
Jeff Bush or Roland Landry On-site Co-Coordinator (alternates)	Mary River Site Tel: 403-450-7312 (24hrs) Milne Inlet Site Tel: 647-723-2077 (24 hrs) Office Tel: 416-814-3160 Email: jeff.bush@baffinland.com Email: roland.landry@baffinland.com
Cheryl Wray Environmental Superintendant	Mary River Site Tel: 403-450-7312 (24hrs) Milne Inlet Site Tel: 647-723-2077 (24 hrs) Email: cheryl.wray@baffinland.com
Al Gorman Operations Manager Dave McCann (alternate)	Office Tel: 416-814-3164 Cell: 416-818-9913 (Al Gorman) Email: al.gorman@baffinland.com Cell: 416-616-8860 (Dave McCann) Email: david.mccann@baffinland.com
Rod Cooper Corporate Contact – VP, Operations and COO Derek Chubb Corporate Contact – VP Sustainable Develop.	Office Tel: 416-814-3158 Cell: 416-8722-5660 (Rod Cooper) Email: rod.cooper@baffinland.com Office Tel: 416-814-3164 Cell: 416-844-0903 (Derek Chubb) Email: Derek.chubb@baffinland.com

As part of the spill response plan, the On-Site Co-Coordinator, acting as incident commander, is responsible for implementing the following procedures:

- Assume authority over the spill scene and personnel involved.
- Activate the Spill Response Plan.
- Evaluate the initial situation and assesses the magnitude of the spill.
- Develop an overall plan of action.
- Prepare a root cause analysis and an incident investigation for major spills.
- Report to the Operations Manager and provide recommendations on resource requirements (additional manpower, equipment, material, etc.) to complete the cleanup effort. The responsibility of the co-ordinator is to mobilise personnel and equipment to implement the cleanup.

The responsibilities of the Environmental Department on behalf of the Operations Manager include the following:

- Report the spill to NWT 24-hour Spill Report Line at (867) 920-8130, to Qikiqtani Inuit Association Lands Administrator at (867) 975-8422, QIA for spill on Inuit owned lands at (867) 975-8419 or (867) 979-5391, and DIAND Manager of Field Operations at (867) 975-4295.
- Provide liaison with Management to keep them informed of cleanup activities.
- Collect photographic records of the spill event and clean up efforts.
- Obtain additional required resources not available on-site for spill response and cleanup.
- Act as the spokesperson with government agencies as well as the public and the media as appropriate.
- Document the cause of the spill and effectiveness of the cleanup effort, and implement the appropriate measures to prevent a recurrence of the spill.
- Prepare and submit follow-up documentation required by appropriate regulators.
- Ensure that the spill is cleaned up and all follow-up communication and reports are filed with the DIAND Water Resources, Environment Canada offices and QIA Land Administrator. Ensure that the spill reports submitted to QIA include photographic records and an updated map showing UTM coordinates, date, amount and the nature of spill.

The responsibilities of the Corporate Contact include the following:

- Work with the Environmental Department on regulatory follow-up as necessary.
- Act as the spokesperson with government agencies as well as the public and the media on any significant spill events.

Once a spill event is reported, the On-Site Co-Coordinator establishes a specific strategy for containing and controlling the spill and to initiate the clean up activities. Other site personnel such as the Fire chief, Health and Safety Officer, and Operations Manager may act as technical advisers prior to and during the intervention. The trained Spill Response Team will conduct all emergency spill response operations under the leadership of the On-Site Co-Coordinator. During the cleanup phase of the intervention other site personnel (e.g., heavy equipment operators, labourers, etc.) may be involved in the intervention. Figure 4 presents an organization chart of the Spill Response Team.

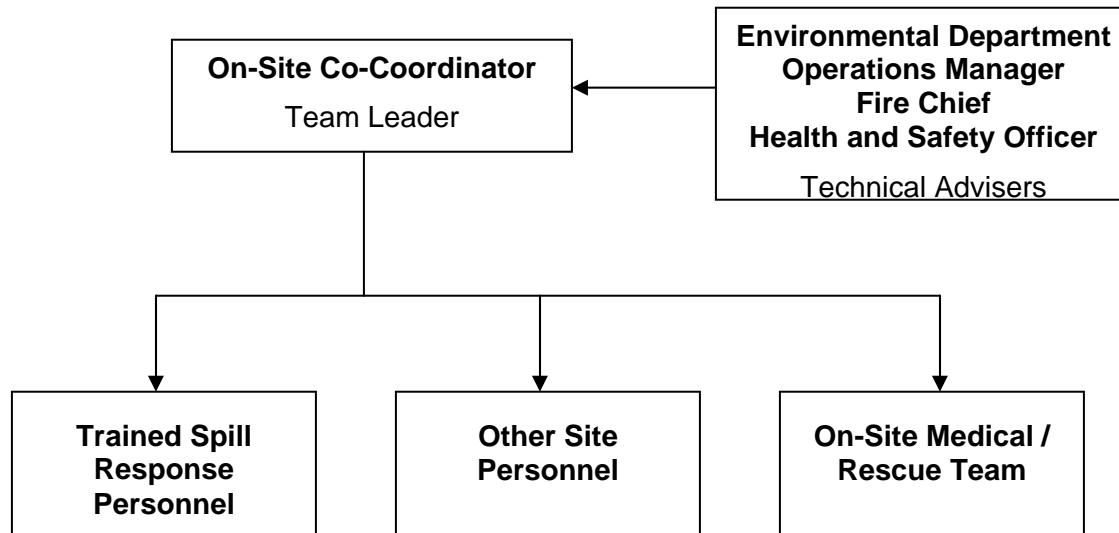


Figure 1: Spill Response Team Organization Chart

Baffinland ensures that all contracted shipping companies have their own spill contingency plan to respond to spill events during the course of their operations. When shipping hazardous materials to and from the site transport companies are required to carry out their operations in accordance with federal and international Transport of Dangerous Goods Regulations (i.e., TDGR – Clear Language, IMDG, IATA).

In the event of a spill of hazardous materials (exceeding the quantities listed in Part 8.1 (1) of the TDGR) during transport, the shipping company immediately report the incident to the local police and the Nunavut Emergency Services at 1-800-693-1666 (as stated in Part 8.1 (5), TDGR). The immediate report must include as much of the information listed in Part 8.2, TDGR, as is known at the time of the report. A follow-up report must be made, in writing, to the Director General within 30 days after the occurrence of the accidental release, the "dangerous goods accident" or the "dangerous goods incident". The follow-up report must include the information listed in Part 8.3, TDGR.

If a spill occurs on water during transport or during the transfer of hazardous materials from ship to land, the shipping company is responsible to implement the appropriate spill response measures in accordance to their spill contingency plan. If needed, the Baffinland Spill Response Team can be available to assist the shipping company in their emergency response operations.

4. Training and Drills

All site personnel is informed that any spill of fuel or other hazardous liquids or solids, whatever the extent, has to be reported immediately to the On-Site Co-Coordinator.

The On-Site Co-Coordinator selected a certain number of site workers to form the Spill Response Team. Crew members were trained in emergency spill response procedures and operations. Training includes knowledge in the:

- properties of hazardous materials used on site;
- common causes of spills;
- environmental effects of spills;
- worker health and safety during emergency interventions;
- personal protective equipment and clothing;
- spill response procedures and techniques on land, water, snow and ice, and during all 4 seasons;
- spill response equipment and materials.

Training also includes analysis of potential spill events that are more likely to occur during the Mary River Project operations. Fuel spills are more likely to be caused by:

- human error during fuel transfer operations (e.g., tank farm to tanker-trucks, tanker-trucks to tug boats, etc.);
- rupture of tanks, supply lines, or valves from accidental damage, deterioration or equipment failure; or
- road accidents involving tanker-trucks.

Training includes spill response drills and classroom training

5. Materials and Equipment

In order to prevent spills and to provide adequate response in case of spill events, Baffinland maintains on-site the appropriate type and quantity of response equipment and materials.

Spill kits are strategically placed primarily in areas of fuel handling to facilitate immediate first response in the event of a hydrocarbon release to land. To facilitate response to fuel spills to water, two (2) sea-can containers will be positioned at Milne Inlet. Appendix C provides a list of the different spill kits and their contents that are available on-site.

In addition to the spill response material listed in Appendix C, a variety of mobile heavy equipment including excavators, front-end loaders, bull-dozers, haul trucks, a Zodiac boat for inland water use, and an ocean support boat is available to aid in spill response and recovery efforts.

6. Spill Response Procedures

A spill is defined as the discharge of a hazardous product out of its containment and into the environment. Potential hazards to humans, vegetation, water resources, fish and wildlife vary in severity, depending on several factors including nature of the material, quantity spilled, location and season. Fuel is the main product that may be spilled and therefore spill response procedures focus on this hazardous material. Other chemicals that may be spilled include sewage water, calcium chloride flakes and small quantities of lubricants and oils.

All site personnel are briefed on the procedures to be followed to report a spill and initiate spill response. The first person to notice a spill takes the following steps:

1. Immediately warn other personnel working near the spill area;
2. Evacuate the area if the health and safety of personnel is threatened;
3. Notify the On-Site Co-Coordinator, who will initiate the spill response operations;
4. In the absence of danger, and before the spill response team arrives at the scene, take any safe and reasonable measure to stop, contain and identify the nature of the spill.

All spill response interventions carried out by the spill response team follow these general procedures:

Source Control - Reduce or stop the flow of product without endangering anyone. This may involve very simple actions such as turning off a pump, closing a valve, sealing a puncture hole with almost anything handy (e.g., a rag, a piece of wood, tape, etc.), raising a leaky or discharging hose at a level higher than the product level inside the tank, or transferring fuel from leaking containers.

Control of Free Product - Prevent or limit the spread of the spilled material. Accumulate/concentrate spilled product in an area to facilitate recovery. Barriers positioned down-gradient of the spill will slow or stop the progression of the spill. Barriers can consist of absorbent booms, dykes, berms, or trenches (dug in the ground or in ice).

Protection - Evaluate the potential dangers of the spill in order to protect sensitive ecosystems and natural resources. Block or divert the spilled material away from sensitive receptors. This can also be achieved by using various types of barriers.

Clean up the Spill – Recover and containerize as much free product as possible. Recover and containerize/treat contaminated soil, water, and snow. Pressure-wash contaminated

bedrock surfaces, shorelines, ice and recover as much as possible oily water for containerization and/or treatment.

Report the Spill - Provide basic information such as date and time of the spill, type and amount of product discharged, photographic records, location and approximate size of the spill, actions already taken to stop and contain the spill, meteorological conditions and any perceived threat to human health or the environment. Reporting requirements are presented on Section 8.

Response procedures specific to spills on land, water, snow and ice are presented in the following sections. Procedures vary depending on the season. Spill response operations, techniques, equipment and materials are further detailed in the spill response training course manual.

6.1 Spills on Land

Response to spills on land will include the general procedures previously detailed. The main spill control techniques involve the use of two types of barriers: dykes and trenches. Barriers should be placed down-gradient (down-slope) from the source of the spill, and as close as possible to the source of the spill. Barriers slow the progression of the fuel and also serve as containment to allow recovery of the fuel.

Depending on the volume spilled, the site of the spill as well as available material, a dyke may be built with soil, booms, lumber, snow, etc. A plastic liner should be placed at the foot of and over the dykes to protect the underlying soil or other material and to facilitate recovery of the fuel. Construct dykes in such a way as to accumulate a thick layer of free product in a single area (V-shaped or U shaped).

Trenches are useful in the presence of permeable soil and when the spilled fuel is migrating below the ground surface. A plastic liner should be placed on the down-gradient edge of the trench to protect the underlying soil. Liners should not be placed at the bottom of the trench to allow water to continue flowing underneath the layer floating oil.

The use of large quantities of absorbent materials to recover important volumes of fuel should be avoided. Large volumes of free-product should be recovered, as much as possible, by using vacuums and pumps, and containerized. Mixtures of water and fuel may be processed through an oil-water separator. Absorbent sheets should be used to soak up residual fuel on water, on

the ground (soil and rock), and on vegetation. Peat moss may also be sprinkled on vegetation to absorb films of petroleum products.

6.2 Spills on Water

Response to spills on water includes the general procedures previously detailed. Various containment, diversion and recovery techniques are discussed in the following sections. The following elements must be taken into consideration when conducting response operations:

- type of water body or water course (lake, ocean, stream, river)
- water depth and surface area
- wind speed and direction
- presence and range of tides
- type of shoreline
- seasonal considerations (open-water, freeze-up, break-up, frozen)

Containment of an oil slick on the **ocean** requires the deployment of mobile floating booms to intercept, control, contain and concentrate (i.e., increase thickness) the floating oil. One end of the booms is anchored to shore while the other is towed by a boat and use to circle the oil slick and return it close to shore for recovery using a skimmer. Reducing the surface area of the slick increases its thickness and thereby improves recovery. Mechanical recovery equipment (i.e., skimmers and oil/water separators) will be mobilized to site if required.

If oil is spilled in a **lake** it may not be possible to deploy booms using a boat. In this case, measures are taken to protect sensitive and accessible shoreline. The oil slick is monitored to determine the direction of migration. In the absence of strong winds the oil will likely flow towards the discharge of the lake. Measures is taken to block and concentrate the oil slick at the lake discharge using booms where it will subsequently be recovered using a portable skimmer, a vacuum, or sorbent materials.

In small slowly-flowing rivers, **streams**, channels, inlets or ditches, inverted weirs (i.e., siphon dams) is used to stop and concentrate moving oil for collection while allowing water to continue to flow unimpeded. In the case of floating oil, in a **stream**, heading for a culvert (i.e., at a road crossing) a culvert block is used to stop and concentrate moving oil for collection while allowing water to continue to flow unimpeded. In both cases oil will then be recovered using a portable skimmer or sorbent materials.

In the case of spills in larger **rivers**, with fast moving currents, diversion booming is used to direct the oil slick ashore for recovery. Single or multiple booms (i.e., cascading) may be used for diversion. Typically, the booms are anchored across the river at an angle. The angle will

depend on the current velocity. Choosing a section of a river that is both wider and shallower makes boom deployment easier. Diversion booming may also be used to direct an oil slick away from a sensitive area to be protected.

6.3 Spills on Snow and Ice

In general, snow and ice will slow the movement of hydrocarbons. The presence of snow may also hide the oil slick and make it more difficult to follow its progression. Snow is generally a good natural sorbent, as hydrocarbons have a tendency to be soaked up by snow through capillary action. However, the use of snow as a sorbent material is to be limited as much as possible. Snow and frozen ground also prevent hydrocarbons from migrating down into soil or at least slow the migration process. Ice prevents seepage of fuel into the water.

Response to spills on snow and ice includes the general procedures previously detailed. Most response procedures for spills on land may be used for spills on snow and ice. The use of dykes (i.e., compacted snow berms lined with plastic sheeting) or trenches (dug in ice) slow the progression of the fuel and also serve as containment to allow recovery of the fuel.

Free-product is recovered by using a vacuum, a pump, or sorbent materials. Contaminated snow and ice is scraped up manually or using heavy equipment depending on volumes. The contaminated snow and ice is placed in containers or within plastic lined berms on land. If required, a contaminated snow storage site is to be located in close proximity to one of the four (4) main work sites to facilitate inspection and monitoring, in an area which is still easily accessible once it is time to remove the snow (i.e., spring or summer), and at least 30 m away from any body of water or ditch. Once enough snow has melted, the oily water is removed from the storage and processed through an oil-water separator that would be mobilized to site. Hydrocarbons recovered will be burned in the camp incinerator or shipped off-site for processing.

6.4 Disposal of Spilled Material

Plastic ore sacks or steel drums are used to contain and transport contaminated soil for removal from site to a licensed southern disposal facility by either air or by road followed by sealift. Alternatively, a lined containment facility may be constructed on-site for the treatment of the contaminated soils. Such a facility requires regulatory approval and an amendment to Baffinland's water license. Temporary storage of contaminated materials is to be within plastic lined berms. Used sorbent material is burned in the site incinerators.

7. Potential Spill Analysis

In order to prepare for emergency spill response, potential spill analysis was conducted on various worst case scenarios. The exercise serves to identify potential risk areas, as well as to determine the fate of spilled products and their environmental effects. Four (4) potential spill scenarios were identified for the Mary River Project:

1. Milne Inlet – Ocean spill during boat re-fuelling
2. Mary River Camp Area - Spill of a fuel bladder to the ground
3. Road between Milne Inlet and Mary River – Spill of the contents of a tanker truck
4. Rotating Biological Contactor at Milne Inlet – Spill of sewage

These four (4) spill scenarios are analysed in detail in the following pages.

Scenario #1: Milne Inlet Ocean Spill

Description of incident: Spill of the partial contents of a tanker truck to the ocean through the fuel re-supply line servicing the tug-boats. Spillage of fuel by gravity. Spill occurs during open water season.

Potential causes: equipment malfunction (valve, hose), human error.

Hazardous products spilled: Diesel fuel.

Maximum volume spilled: 10,000 litres.

Estimated time to spill entire volume: 10 minutes.

Immediate receiving medium: ocean, near shore.

Most probable direction of slick migration: variable, dependent on wind velocity and direction, direction of tide, presence and size of waves.

Distance and direction to nearest receiving body of water: N/A.

Resources to protect: sand flats at mouth of Phillips Creek, approximately 800 m east, all shorelines.

Estimated emergency spill response time: 20 minutes after spill is noticed.

Spill response procedures: Contain oil slick using floating booms deployed by boat as described in section 6.2. Protect shoreline and mouth of river using floating or sorbent booms, if still possible. Collect free-product for temporary storage using sorbents and mobilize additional equipment as necessary. Clean-up soiled shoreline.

Scenario #2: Mary River Camp Area Spill

Description of incident: Spill of the contents of one of the 16 fuel bladders (within the tank farm) to the ground during fuel transfer from a tanker truck. Spillage of fuel by gravity. Spill occurs at the south-western end of the tank farm.

Potential causes: equipment malfunction (valve, pump), human error, accident.

Hazardous products spilled: Diesel fuel, Jet-A Fuel.

Maximum volume spilled: 113,560 litres.

Estimated time to spill entire volume: 90 minutes.

Immediate receiving medium: soil.

Most probable direction of slick migration: west, towards the lake.

Distance and direction to nearest receiving body of water: approximately 400 m west of the tank farm.

Resources to protect: lake and shore.

Estimated emergency spill response time: 15 minutes after spill is noticed.

Spill response procedures: Contain and recover oil spill using dykes or trenches as described in section 6.1. Prevent the oil from reaching natural drainage paths leading to the lake. Collect free-product for temporary storage. Excavate contaminated soil and/or snow, store and manage appropriately.

Scenario #3: Road Accident Tanker Truck Spill

Description of incident: Spill of the contents of a tanker truck to a stream. Spill occurs in an isolated area between Milne Inlet and Mary River.

Potential causes: accident, human error.

Hazardous products spilled: Diesel fuel, Jet-A Fuel.

Maximum volume spilled: 50,000 litres.

Estimated time to spill entire volume: 45 minutes.

Immediate receiving medium: stream.

Most probable direction of slick migration: downstream and into a river named Phillips Creek; the road between Mary River and Milne Inlet follows Phillips Creek, and crosses many streams (that discharge into Phillips Creek) over a distance of approximately 50 km. Phillips Creek eventually discharges into the ocean at Milne Inlet.

Distance and direction to nearest receiving body of water: N/A.

Resources to protect: streams, Phillips Creek and the ocean.

Estimated emergency spill response time: 60 minutes after spill is reported to site personnel (assuming truck driver is injured and cannot commence spill response procedures).

Spill response procedures: Contain and recover oil slick downriver as described in section 6.2, protect shorelines using sorbent booms. Collect free-product for temporary storage. Clean-up

soiled shorelines. If the response crew arrives before the complete spill, seal the leak where feasible, contain and recover oil spill on ground using dykes and trenches as described in 6.1. Also, if the truck driver is not injured, he will act as a first responder and immediately initiate the spill contingency plan as defined in section 6 using the spill kit kept in the fuel trucks.

Scenario #4: Milne Inlet sewage spill

Description of incident: Spill from the Rotating Biological Contactor reservoir. A pipe is accidentally being dislodged and non treated wastewater escape the reservoir

Potential causes: pipe failure

Products spilled: sewage

Maximum volume spilled: 15,000 litres.

Estimated time to spill entire volume: 15 minutes.

Immediate receiving medium: soil

Most probable direction of slick migration: downstream and into a local depression east of the RBC wastewater treatment facility. That local depression dries in the summer and intercepts the maximum spilled volume.

Distance and direction to nearest receiving body of water: 150 m

Resources to protect: one stream and the ocean.

Estimated emergency spill response time: 15 minutes after spill is noticed.

Spill response procedures: Once the treatment is achieved, the content of the reservoir is normally pumped by a vacuum truck to be discharged elsewhere. Therefore a vacuum truck is available in the area. In case of a spill of non-treated wastewater (sewage), the slick would be pumped using the vacuum truck. The piping would be repaired and the content of the truck would be discharged back in the RBC treatment unit. Impacted soils (if any) would be excavated and placed within the landfill.

8. Reporting Requirements

Quantities of hazardous substances spilled which require reporting are listed in schedule B of the Nunavut Spill Contingency and Reporting Regulation.

After the initial field emergency response to the spill event, spills are reported to the 24-hour Spill Report Line:

24-Hour Spill Report Line

Tel. (867) 920-8130

or

Fax (867) 920-8127

Failure to report a spill can lead to fines. The Qikiqtani Inuit Association Lands Administrator will also be immediately notified at (867) 975-8422. Similarly, the INAC Manager of Field Operations will be immediately notified of the spill event at (867) 975-4295. In the event of a spill on the ocean, the incident will be reported to the Canadian Coast Guard (Arctic region) 1-800-265-0237 (24-hour).

It is the responsibility of the Environmental Department on behalf of the Operations Manager to prepare the proper reports and transmit them to regulatory authorities. Table 3 presents an additional contact list for spill reporting.

Table 3: Contact List for Spill Reporting

Department	Person	E-mail	Telephone
DIAND-Waters (Iqaluit)	Jim Rogers	rogersji@inac-ainc.gc.ca	(867) 975-4550
DIAND-Inspector	Andrew Keim	keima@inac-ainc.gc.ca	(867) 975-4289
DIAND-Qikiqtani	David Abernethy	abernethyd@inac-ainc.gc.ca	(867) 975-4555
DIAND-Field Operations	Peter Kusugak	kusugakp@inac-ainc.gc.ca	(867) 975-4289
DFO-Iqaluit	Amy Lui	luiA@dfo-mpo.gc.ca	(867) 979-8007
EC-Iqaluit	Jim Noble		(867) 975-4639
GN-DOE	Robert Eno	reno@gov.nu.ca	(867) 975-7748
Qikiqtani Inuit Association	Salamonie Shoo	landadmin@qia.ca	(867) 975-1643
Pond Inlet Health Clinic			(867) 899-7500 (867) 899-8431
Pond Inlet RCMP			(867) 899-1111 (867) 899-6055

Qikiqtani General Hospital (Iqaluit)		(867) 979-7300
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Afterwards, the spill event is reported in writing using the standard Spill Report Form presented in Appendix A.

The written report includes the following information:

- date and time of the incident;
- location or map coordinates and direction of spill movement if not at steady-state;
- party responsible for the spill;
- type and estimated quantities of spilled contaminant(s);
- specific cause of the incident;
- status of the spill indicating if spilled materials are still moving or now at steady-state;
- approximate surface of contaminated area;
- a photographic record of the spill event and clean up efforts;
- factors affecting spill or recovery such as temperature, wind, etc.;
- status on containment actions indicating whether a) naturally, b) booms, dykes or other, c) no containment has been implemented;
- corrective action taken or proposed, to clean, contain or dispose spilled material;
- whether assistance is required and in what form;
- whether the spill poses a hazard to persons or property (i.e., fire, drinking water);
- comments and recommendations;
- the spill report provided with a root cause analysis report detailing all the above information;
- name, position and employer of the person reporting the spill; and,
- name, position department of the person to whom the spill is reported.

In addition, QIA requests Baffinland produce a site map(s) listing the location in UTM coordinates, date, amount and nature of the substance spilled. The map(s) should be updated and sent to QIA whenever a spill occurs. The map(s) will also detail major project components and all water bodies.

In the event of a spill involving the marine carrier delivering bulk fuel, Baffinland will ensure that the subcontractor reports any spill event under its responsibility.

Appendix A

Standard Nunavut Spill Report Form



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

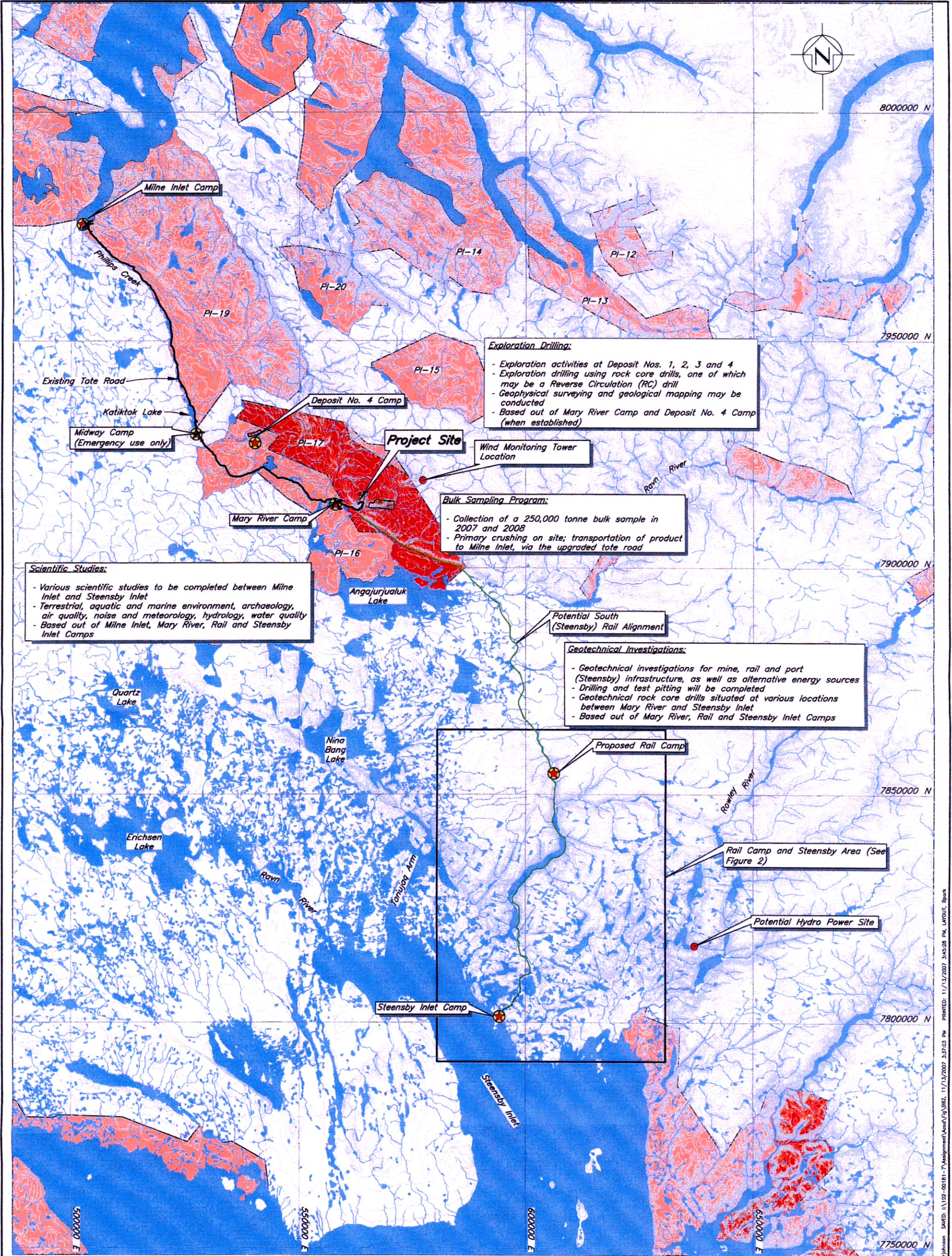
A	REPORT DATE: MONTH – DAY – YEAR		REPORT TIME		<input type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____
	OCCURRENCE DATE: MONTH – DAY – YEAR		OCCURRENCE TIME			
C	LAND USE PERMIT NUMBER (IF APPLICABLE)			WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION				REGION <input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES MINUTES SECONDS			LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION			
G	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION			
H	PRODUCT SPILLED		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
I	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS					
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE	
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE	

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER
		STATION OPERATOR		YELLOWKNIFE, NT	(867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

Appendix B

Layouts of main fuel storage and spill kit locations



LEGEND:

- River/Stream/Drainage
- Potential Rail Alignment
- Existing Road
- Contour
- Airstrip
- Inuit Owned Land—Surface Only Excluding Minerals
- Inuit Owned Land—Surface and Subsurface including Minerals
- Mineral Lease Boundary
- Camp (Existing or Proposed)
- Proposed Alternate Energy Site

NOTES:

- Base Map: © Her Majesty the Queen in Rights of Canada, Department of Natural Resources (2004). All rights reserved. (Government of Canada, 2006).
- Coordinate grid is shown in UTM (NAD83) Zone 17 West and is in metres.
- South (Steensby) Rail Alignment provided by Canarail.

Scale 8 4 0 8 16 24 32 40 Kilometres



MARY RIVER PROJECT

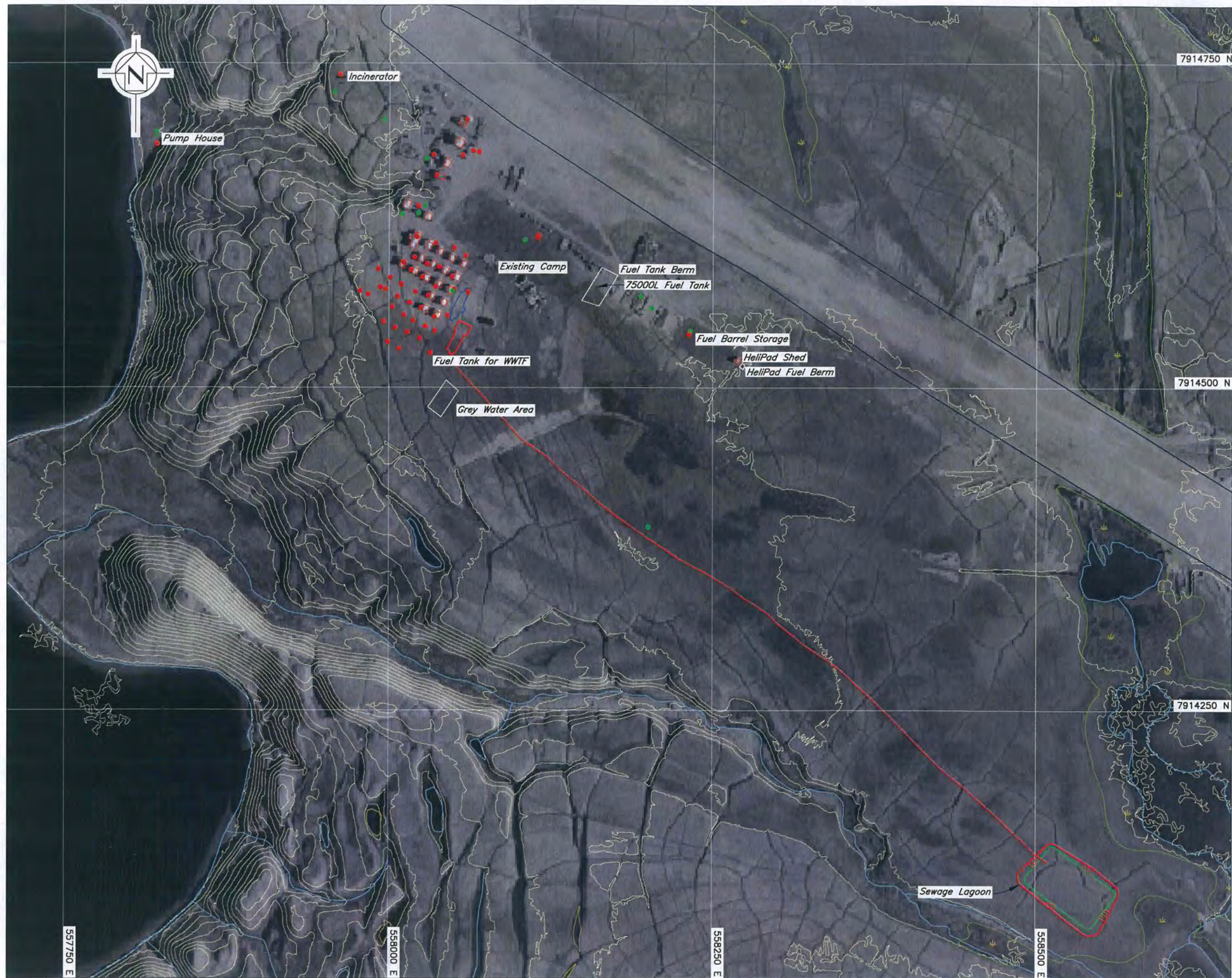
REGIONAL PLAN

Knight Piesold
CONSULTING

P/A NO. NB102-00181/7	REF. NB07-00929	REV. 0
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FIGURE 1

REF FILE(S): Mine Site Layout Mine_Site_Water_Veget: PROJECT SITE PLAN 2m INTERVAL REV: Mary River Orissa IMAGE FILE(S): logo-big corp edit Baffinland logo-big corp Enbridge Mary River



LEGEND:

- River/Stream/Drainage
- Spill Kit
- Fuel Barrel

NOTES:

- Airphotos provided by Eagle Mapping (2005) and ALS contour data provided by Terrapoint (2006).
- Coordinate grid is shown in UTM (NAD83) Zone 17 West and is in metres.
- Contours are in metres. Contour interval is 1.5 metres.

Scale Metres

Baffinland
IRON MINES CORPORATION

MARY RIVER PROJECT

MARY RIVER CAMP

Knight Piésold
CONSULTING

P/A NO. NB102-00181/11	REF. -	REV. -
FIGURE X.X		

NORTH BY ON. SAVED: \\102-00181-11\Mapping\KPC\Map\B201_1\14/2008 10:14:00 AM PRINTED: 1/14/2008 10:14:05 AM Layout1: rjohnson

Appendix C

Spill Kits and Contents

VERSATECH SPILL KITS AT BAFFINLAND'S MARY RIVER PROJECT SITE:

Kit #4 six (6) kits
 Kit #5 four (4) kits
 Kit #6 four (4) kits
 Kit #7 eighteen (18) kits
 Kit #8 eight (8) kits

Kit No./Details	Contents	Quantity
4 20 GALLON LAB PACK Absorbs up to 18 Gallons Lab Pack Container	Sorbent Pads (19" x 17" x 3/8") Sorbent Socks (3" x 4ft.) Sorbent Pillows Nitrile Gloves (pair) Disposal Bag Epoxy Putty	20 5 4 2 3 1
5 PORTABLE RESPONSE KIT Absorbs up to 65 Gallons Durable Yellow Rollout Container 2 convenient sizes - 64 Gallon 96 Gallon	Sorbent Pads (19" x 17" x 3/8") Sorbent Socks (3" x 4ft.) Xsorb (6 quart) Hand broom/dust pan Nitrile Gloves (pair) Disposal Bag Disposable Coveralls Drain cover Splash resistant goggles	150 6 1 1 2 4 2 2 2
6 SPILL CHEST Absorbs up to 170 Gallons Heavy duty plastic Yellow Container Can be moved with a Forklift	Sorbent Pads (19" x 17" x 3/8") Sorbent Socks (3" x 4 ft) Sorbent Booms (5" x 10 ft) Sorbent Pillows (15" x 9 ft) Sorbent Roll (38" x 144 ft) Nitrile Gloves (pair) Disposal Bag Epoxy Putty Barricade tape (Roll)	100 8 4 16 1 2 4 1 1
7 HEAVY DUTY DRUM KIT Absorbs up to 75 Gallons Heavy duty plastic Yellow Container Drum sizes include 65 & 95 US gallons or an economy 45 gallon steel drum	Sorbent Pads (19" x 17" x 3/8") Sorbent Booms (5" x 10ft) Xsorb (6 quart) Nitrile Gloves (pair) Disposal Bag Disposable Coveralls Drain cover Splash resistant goggles	100 4 1 2 4 2 1 2

<p style="text-align: center;">8</p> <p>EXTRA LARGE DRUM KIT</p> <p>Absorbs up to 120 Gallons</p> <p>Heavy duty plastic Yellow Container</p>	Sorbent Pads (19" x 17" x 3/8")	300
	Sorbent Socks (4ft)	8
	Sorbent Socks (8ft)	8
	Sorbent Pillows (large)	12
	Sorbent Pillows (small)	8
	Plug Putty	2
	Drain Cover	7
	Disposal Bags (roll)	1
	Disposable Coveralls	2
	Barrier Tape (roll)	1
	Granular Absorbant (12.5 kg)	1

**SPILL RESPONSE EQUIPMENT TO BE STORED IN 2 SEA CONTAINERS AT MILNE INLET
FOR BAFFINLAND'S MARY RIVER PROJECT:**

Description
Oil containment boom, anchors and towing bridles (300m)
Multisorb granular absorbent (500 bags)
Custom pump skid for emergency fuel transfers from one tank to another
2" x 25' transfer hose for emergency transfer pump (8 sections)
18" x 18" x 6" Arctic mini berm for under fittings (12 units)
36" x 36" x 6" Arctic mini berm for under fittings (12 units)
Insta berm 10' x 10' x 15" Arctic (2 units)
Oil sheets for replenishing spill kits (300 bags)

Appendix D

MSDS of hazardous materials used on site

- Aviation Fuel (6p.)
- Calcium Chloride Flake (8p.)
- Cast Booster (3p.)
- CP-43 Diesel (6p.)
- Detonating Cord (3p.)
- DR-133 POLYMER (4p.)
- Electric Detonators (4p.)
- EZ-MUD (6p.)
- Gasoline (6p.)
- Jet A (7p.)
- Lubtac Rod Grease (4p.)
- Non-Electric Detonators (5p.)
- Packaged Emulsion Explosives (3p.)
- Packaged Dynamites and Explosive Gelatins (3p.)
- Potassium Chloride (Potash) (4p.)
- Shock Tube (3p.)
- Tellus T32 O (11p.)
- W-OB POLYMER (4p.)
- Emulsion Explosives – Dyno AP (3p.)

**Shell Canada Limited**
Material Safety Data Sheet

Effective Date: 2002-08-14

Supersedes: 2001-03-09

Class B2 Flammable
LiquidClass D2B Other Toxic
Effects - Skin Irritant**1. PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT: **SHELL AVGAS 100 LL**
SYNONYMS: AVIATION GASOLINE
PRODUCT USE: Fuel
MSDS Number: 101-200

MANUFACTURER
Shell Canada Limited
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS
Shell Emergency Number 1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER 613-996-6666

For general information: 1-800-661-1600
For MSDS information: 403-691-3982
(From 7:30 to 4:30 Mountain Time) 403-691-2220

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.

*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Naphtha (Petroleum), Light Alkylate	64741-66-8	70 - 90	Yes
Toluene	108-88-3	10 - 30	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Blue Colour Clear Typical Gasoline Odour

Routes of Exposure: Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

Hazards:

Handling: Flammable Liquid.
Irritating to skin.
Vapours are moderately irritating to the eyes.
Vapours are moderately irritating to the respiratory passages. The liquid when accidentally aspirated into the lungs can cause a severe inflammation of the lung.
Eliminate all ignition sources.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Avoid prolonged exposure to vapours.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: Do not induce vomiting. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person. Obtain medical attention immediately.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

Firefighting Instructions: Extremely flammable. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Product will float and can be reignited on surface of water. Do not use water except as a fog. Use water to cool fire exposed containers. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Always stay away from ends of containers due to explosive potential. Fight fire from maximum distance. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus. Flashback may occur along vapour trail.

Hazardous Combustion Products: Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Flammable". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Try to work upwind of spill. Avoid direct contact with material. Saturated clothing should be immediately removed to avoid flammability hazard. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. Dispose of recovered material as noted under Disposal Considerations. Explosion and fire is the most immediate problem. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling: Extremely flammable. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Never siphon by mouth. Do not use as a cleaning solvent. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Use explosion-proof ventilation to prevent vapour accumulation. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Gasoline: 300 ppm (STEL: 500 ppm)

Toluene (skin): 50 ppm

Skin Notation: The occupational exposure limit is based on the fact that skin and/or eye is a major route of exposure through absorption.

Mechanical Ventilation: Use explosion-proof ventilation as required to control vapour concentrations. Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Impervious gloves (viton, polyvinyl alcohol) should be worn at all times when handling this product. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Blue Colour Clear
Odour:	Typical Gasoline Odour
Odour Threshold:	Not available
Freezing/Pour Point:	Freeze Point = -58 degrees C
Boiling Point:	75 - 170 degrees C
Density:	Not available
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	>285 mm Hg @ 38 degrees C
pH:	Not applicable
Flash Point:	Method Tag Closed Cup <1 degrees C
Lower Explosion Limit:	1.4 % (vol.)
Upper Explosion Limit:	7.6 % (vol.)
Autoignition Temperature:	Not available
Viscosity:	Not available
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (K_{ow}):	Not available
Water Solubility:	Insoluble
Other Solvents:	Hydrocarbon Solvents

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Incompatible Materials:	Avoid strong oxidizing agents.

Conditions of Reactivity:

Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
Naphtha (Petroleum), Light Alkylate	LC50 Inhalation Rat >11000 mg/m3 for 4hours LD50 Dermal Rat >4000 mg/kg LD50 Oral Rat >8000 mg/kg
Toluene	LD50 Oral Rat = 5000 mg/kg LC50 Inhalation Rat = 8000 ppm for 4 hours LD50 Dermal Rabbit = 14000 mg/kg
Routes of Exposure:	Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.
Formulation:	This product contains n-hexane.
Irritancy:	This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.
Chronic Effects:	Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged or repeated exposure to high vapour concentration or ingestion can cause headache, nausea, dizziness, and central nervous system depression, and in rare cases may sensitize heart muscles causing heart arrhythmia. Peripheral neurotoxicity has been reported in connection with over exposure to n-hexane. This product contains low levels of lead. Chronic, low grade exposure to lead compounds could lead to insomnia, anorexia, nausea and vomiting, diarrhea, anemia, sensory loss and muscular weakness.
Pre-existing Conditions:	Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

12. ECOLOGICAL INFORMATION

Environmental Effects:	Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May be harmful to aquatic life. Fish Toxicity: 5 to 40 ppm 96 hr TLm Rainbow Trout Freshwater
Biodegradability:	Not available. Rapid volatilization.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1203
Proper Shipping Name	GASOLINE
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG II
Additional Information	Marine Pollutant
Shipping Description	GASOLINE Class 3 UN1203 PG II Marine Pollutant

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B2 Flammable Liquid Class D2B Other Toxic Effects - Skin Irritant
DSL/NDL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act.
Other Regulatory Status:	No Canadian federal standards.

16. ADDITIONAL INFORMATION**LABEL STATEMENTS**

Hazard Statement :	Flammable Liquid. Irritating to skin.
Handling Statement:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Avoid prolonged exposure to vapours. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.
Revisions:	This MSDS has been reviewed and updated. Changes have been made to: Section 14



Material Safety Data Sheet

CALCIUM CHLORIDE, FLAKE

A. GENERAL INFORMATION

TRADE NAME (COMMON NAME): FLAKE CALCIUM CHLORIDE		CAS NUMBER: 10043-52-4 (anhydrous)	
CHEMICAL NAME AND/OR SYNONYM: Calcium Chloride, Dihydrate			
FORMULA: CaCl ₂ - 2H ₂ O		MOLECULAR WEIGHT: 147.02	
MANUFACTURER/ADDRESS: GENERAL CHEMICAL CORPORATION 90 East Halsey Road Parsippany, NJ 07054			
CONTACT: Manager, Product Safety	PHONE NUMBER: (973) 515-1840	LAST ISSUE DATE: September, 1994	CURRENT ISSUE DATE: May, 2001

B. FIRST AID MEASURES

		EMERGENCY PHONE NUMBER: (800) 631-8050
EYES:	Flush promptly with plenty of water, continuing for at least 15 minutes. Get medical attention.	
SKIN:	Wash with plenty of water.	
INHALATION:	Remove to fresh air.	
INGESTION:	If conscious, immediately give 2 to 4 glasses of water, and induce vomiting by touching finger to back of throat. Get medical attention for irritation, ingestion, or discomfort from inhalation.	

C. HAZARDS INFORMATION

INHALATION: Dust or mist inhalation may irritate nose, throat, and lungs.	
INGESTION: Low in toxicity. LD ₅₀ (rat): 1.4 g/kg.* - Reference (e) May irritate gastrointestinal tract. *anhydrous basis.	
SKIN: May cause skin irritation. Under conditions of prolonged contact or when moisture is present, superficial burns may result. Contact with abraded skin or cuts can cause severe necrosis.	
EYES: May irritate or burn eyes.	
PERMISSIBLE CONCENTRATION: AIR (SEE SECTION J) Also, no TLV established by ACGIH.	BIOLOGICAL None
UNUSUAL CHRONIC TOXICITY: None.	

C. HAZARDS (Cont.)

FLASH POINT: Not flammable	AUTO IGNITION TEMPERATURE NA	FLAMMABLE LIMITS IN AIR (% BY VOL.) LOWER - NA UPPER - NA
OPEN CUP <input type="checkbox"/> CLOSED CUP <input type="checkbox"/>		
UNUSUAL FIRE AND EXPLOSION HAZARDS See hazard of contact with zinc as in galvanized iron: Section G.		

D. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED: NA	
FIRE EXTINGUISHING AGENTS TO AVOID: NA	
SPECIAL FIREFIGHTING PRECAUTIONS: None.	
VENTILATION: Local exhaust: In packaging and uploading areas, over open processing equipment, and any other places where dusty or misty condition prevails. Natural ventilation: Adequate for other areas.	
NORMAL HANDLING: Avoid contact with eyes, skin or clothing. Avoid breathing mist. Use good personal hygiene and housekeeping.	
STORAGE: Store in a cool, dry area. Prolonged storage may cause product to cake and become wet from atmospheric moisture.	
SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE QUIPMENT – SECTION E) Shovel up dry chemical and place in metal drum with a cover. Cautiously spray residue with plenty of water.	
SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS:	SIGNAL WORD WARNING!

E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: For dusty or misty condition, wear NIOSH-approved mist respirator.
EYES AND FACE: For dusty or misty condition, or when handling solution where there is reasonable probability of eye contact, wear chemical safety goggles and hat. Under these conditions, do not wear contact lenses.
HANDS, ARMS, AND BODY: As a minimum, wear long-sleeve shirt and trousers, boots, and gloves for routine product use. Cotton gloves permitted for dry product, impervious gloves when using solutions.
OTHER CLOTHING AND EQUIPMENT: Eye-wash facility.

F. PHYSICAL DATA

MATERIAL IS AT NORMAL CONDITIONS: LIQUID <input type="checkbox"/> SOLID <input checked="" type="checkbox"/> GAS <input type="checkbox"/> <input type="checkbox"/> _____		APPEARANCE AND COLOR: Small white flakes; odorless.	
BOILING POINT: Unknown °C	SPECIFIC GRAVITY: (H ₂ O = 1) 0.835 - Reference (b)	VAPOR DENSITY: (AIR = 1) NA: water vapor only.	
MELTING POINT: 176 °C			
SOLUBILITY IN WATER: (% BY WEIGHT) 42 (anhydrous) @ 20°C	pH: Neutral or slightly alkaline - Reference (c).	VAPOR PRESSURE: (mm Hg @ 20°C) <input type="checkbox"/> (PSIG) <input type="checkbox"/> NA	
EVAPORATION RATE: (Butyl acetate=1) <input type="checkbox"/> (Ether = 1.0) <input type="checkbox"/> NA	% VOLATILES BY VOLUME: (AT 20°C) NA		

G. REACTIVITY DATA

STABILITY: UNSTABLE <input type="checkbox"/> STABLE <input checked="" type="checkbox"/>	CONDITIONS TO AVOID: NA
INCOMPATIBILITY (MATERIALS TO AVOID): Sulfuric acid: yields hydrogen chloride gas, which is corrosive, irritating, and reactive. Water-reactive materials, such as sodium: cause an exothermic reaction. Methyl vinyl ether: starts runaway polymerization reaction – Reference (d). Zinc as in galvanized iron: yields hydrogen gas with solutions, which may explode under these conditions. – Reference (d).	
HAZARDOUS DECOMPOSITION PRODUCTS: None.	
HAZARDOUS POLYMERIZATION: MAY OCCUR <input type="checkbox"/> WILL NOT OCCUR <input checked="" type="checkbox"/>	CONDITIONS TO AVOID: NA

H. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

MATERIAL OR COMPONENT/C.A.S. #	WT. %	HAZARD DATA (See Sect. J)
NA		

I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY:		OCTANOL/WATER PARTITION COEFFICIENT NA
Aquatic Toxicity: TLm96: over 1000 ppm (anhydrous) – Reference (a).		
EPA HAZARDOUS SUBSTANCE? (CLEAN WATER ACT SECT. 311) YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF SO, REPORTABLE QUANTITY:		40 CFR 116-117
WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS): Treatment or disposal of waste generated by use of this product should be reviewed in terms of applicable federal, state and local laws and regulations. Users are advised to consult with appropriate regulatory agencies before discharge, treatment or disposal.		
RCRA STATUS OF <u>UNUSED</u> MATERIAL IF DISCARDED: Not a "hazardous waste".	HAZARDOUS WASTE NUMBER: (IF APPLICABLE) --	40 CFR 261

J. REFERENCES

PERMISSIBLE CONCENTRATIONS REFERENCES: None.		
REGULATORY STANDARDS	DOT CLASSIFICATION: Not regulated	49 CFR 173
None.		
GENERAL: (a) NIOSH, Registry of Toxic Effects of Chemical Substances, 1979, Accession No. EV 98 00 000. (b) Weast, R.C. editor, CRC Handbook of Chemistry and Physics, 60 th Edition, 1979-80, CRC Press, Inc., Boca Raton 33431. (c) Hawley, G.N., editor, Condensed Chemical Dictionary, 9 th Edition, 1977, Van Nostrand Reinhold, NYC. (d) Brethwick, L., Handbook of Reactive Chemical Hazards, 2 nd Edition, 1979, Butterworths, Boston. (e) General Chemical Corporation tests, unpublished. (A solution of 25 g/100 ml water was used).		

K. ADDITIONAL INFORMATION

None.

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Material Safety Data Sheet

CALCIUM CHLORIDE, FLAKE

A. GENERAL INFORMATION

TRADE NAME (COMMON NAME): FLAKE CALCIUM CHLORIDE		CAS NUMBER: 10043-52-4 (anhydrous)	
CHEMICAL NAME AND/OR SYNONYM: Calcium Chloride, Dihydrate			
FORMULA: CaCl ₂ - 2H ₂ O		MOLECULAR WEIGHT: 147.02	
MANUFACTURER/ADDRESS: GENERAL CHEMICAL INDUSTRIAL PRODUCTS 90 East Halsey Road Parsippany, NJ 07054			
CONTACT: Manager, Product Safety	PHONE NUMBER: (973) 515-1840	LAST ISSUE DATE: September, 1994	CURRENT ISSUE DATE: March, 2004

B. FIRST AID MEASURES

		EMERGENCY PHONE NUMBER: (800) 631-8050
EYES:	Flush promptly with plenty of water, continuing for at least 15 minutes. Get medical attention.	
SKIN:	Wash with plenty of water.	
INHALATION:	Remove to fresh air.	
INGESTION:	If conscious, immediately give 2 to 4 glasses of water, and induce vomiting by touching finger to back of throat. Get medical attention for irritation, ingestion, or discomfort from inhalation.	

C. HAZARDS INFORMATION

INHALATION: Dust or mist inhalation may irritate nose, throat, and lungs.	
INGESTION: Low in toxicity. LD ₅₀ (rat): 1.4 g/kg.* - Reference (e) May irritate gastrointestinal tract. *anhydrous basis.	
SKIN: May cause skin irritation. Under conditions of prolonged contact or when moisture is present, superficial burns may result. Contact with abraded skin or cuts can cause severe necrosis.	
EYES: May irritate or burn eyes.	
PERMISSIBLE CONCENTRATION: AIR (SEE SECTION J) Also, no TLV established by ACGIH.	BIOLOGICAL None
UNUSUAL CHRONIC TOXICITY: None.	

C. HAZARDS (Cont.)

FLASH POINT: Not flammable	AUTO IGNITION TEMPERATURE NA	FLAMMABLE LIMITS IN AIR (% BY VOL.) LOWER - NA UPPER - NA
OPEN CUP <input type="checkbox"/> CLOSED CUP <input type="checkbox"/>		
UNUSUAL FIRE AND EXPLOSION HAZARDS See hazard of contact with zinc as in galvanized iron: Section G.		

D. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED: NA	
FIRE EXTINGUISHING AGENTS TO AVOID: NA	
SPECIAL FIREFIGHTING PRECAUTIONS: None.	
VENTILATION: Local exhaust: In packaging and uploading areas, over open processing equipment, and any other places where dusty or misty condition prevails. Natural ventilation: Adequate for other areas.	
NORMAL HANDLING: Avoid contact with eyes, skin or clothing. Avoid breathing mist. Use good personal hygiene and housekeeping.	
STORAGE: Store in a cool, dry area. Prolonged storage may cause product to cake and become wet from atmospheric moisture.	
SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE QUIPMENT – SECTION E) Shovel up dry chemical and place in metal drum with a cover. Cautiously spray residue with plenty of water.	
SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS:	SIGNAL WORD WARNING!

E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: For dusty or misty condition, wear NIOSH-approved mist respirator.
EYES AND FACE: For dusty or misty condition, or when handling solution where there is reasonable probability of eye contact, wear chemical safety goggles and hat. Under these conditions, do not wear contact lenses.
HANDS, ARMS, AND BODY: As a minimum, wear long-sleeve shirt and trousers, boots, and gloves for routine product use. Cotton gloves permitted for dry product, impervious gloves when using solutions.
OTHER CLOTHING AND EQUIPMENT: Eye-wash facility.

F. PHYSICAL DATA

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MELTING POINT: 176 °C			
SOLUBILITY IN WATER: (% BY WEIGHT) 42 (anhydrous) @ 20°C	pH: Neutral or slightly alkaline - Reference (c).	VAPOR PRESSURE: (mm Hg @ 20°C) <input type="checkbox"/> (PSIG) <input type="checkbox"/> NA	
EVAPORATION RATE: (Butyl acetate=1) <input type="checkbox"/> (Ether = 1.0) <input type="checkbox"/> NA	% VOLATILES BY VOLUME: (AT 20°C) NA		

G. REACTIVITY DATA

STABILITY: UNSTABLE <input type="checkbox"/> STABLE <input checked="" type="checkbox"/>	CONDITIONS TO AVOID: NA
INCOMPATIBILITY (MATERIALS TO AVOID): Sulfuric acid: yields hydrogen chloride gas, which is corrosive, irritating, and reactive. Water-reactive materials, such as sodium: cause an exothermic reaction. Methyl vinyl ether: starts runaway polymerization reaction – Reference (d). Zinc as in galvanized iron: yields hydrogen gas with solutions, which may explode under these conditions. – Reference (d).	
HAZARDOUS DECOMPOSITION PRODUCTS: None.	
HAZARDOUS POLYMERIZATION: MAY OCCUR <input type="checkbox"/> WILL NOT OCCUR <input checked="" type="checkbox"/>	CONDITIONS TO AVOID: NA

H. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

MATERIAL OR COMPONENT/C.A.S. #	WT. %	HAZARD DATA (See Sect. J)
NA		

I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY:		OCTANOL/WATER PARTITION COEFFICIENT NA
Aquatic Toxicity: TLM96: over 1000 ppm (anhydrous) – Reference (a).		
EPA HAZARDOUS SUBSTANCE? (CLEAN WATER ACT SECT. 311) YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF SO, REPORTABLE QUANTITY:		40 CFR 116-117
WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS): Treatment or disposal of waste generated by use of this product should be reviewed in terms of applicable federal, state and local laws and regulations. Users are advised to consult with appropriate regulatory agencies before discharge, treatment or disposal.		
RCRA STATUS OF <u>UNUSED</u> MATERIAL IF DISCARDED: Not a "hazardous waste".	HAZARDOUS WASTE NUMBER: (IF APPLICABLE) --	40 CFR 261

J. REFERENCES

PERMISSIBLE CONCENTRATIONS REFERENCES: None.		
REGULATORY STANDARDS	DOT CLASSIFICATION: Not regulated	49 CFR 173
None.		
GENERAL: (a) NIOSH, Registry of Toxic Effects of Chemical Substances, 1979, Accession No. EV 98 00 000. (b) Weast, R.C. editor, CRC Handbook of Chemistry and Physics, 60 th Edition, 1979-80, CRC Press, Inc., Boca Raton 33431. (c) Hawley, G.N., editor, Condensed Chemical Dictionary, 9 th Edition, 1977, Van Nostrand Reinhold, NYC. (d) Brethwick, L., Handbook of Reactive Chemical Hazards, 2 nd Edition, 1979, Butterworths, Boston. (e) General Chemical Industrial Products tests, unpublished. (A solution of 25 g/100 ml water was used).		

K. ADDITIONAL INFORMATION

None.

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Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300

Salt Lake City, Utah 84119

Phone: 801-364-4800 Fax: 801-321-6703

E-Mail: dnna.hse@am.dynonobel.com**FOR 24 HOUR EMERGENCY, CALL** CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666**MSDS # 1108****Date 01/23/06**

Supersedes

MSDS # 1108 01/24/05

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): DYNO[®] Cast BOOSTERS - D10, D15, D25, D35, D45, D65, D90, D135
DYNO[®] Cast BOOSTERS - C30, C35, C40, C45, C90
DYNO[®] SLIDER BOOSTERS - DS35, DS45, DS90
DYNO[®] CORD SENSITIVE BOOSTERS - CS35, CS45, CS90, CS135
SEIS X[®]
DYNO[®] STINGER
TROJAN[®] SPARTAN[®]
TROJAN[®] SPARTAN[®] Slider
TROJAN[®] Stinger
TROJAN[®] NB
TROJAN[®] Twinplex
TROJAN[®] OPTIPRIME[®]

Product Class: Cast Booster**Product Appearance & Odor:** Tan to brown solid with no odor. May also be silvery gray. Packaged in paper or plastic tube.**DOT Hazard Shipping Description:** Booster 1.1D UN0042 II**NFPA Hazard Classification:** Not Available (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	<u>Occupational Exposure Limits</u>	
			ACGIH TLV-TWA	OSHA PEL-TWA
Pentaerythritol Tetranitrate (PETN)	78-11-5	30-70	None Established	None Established
Trinitrotoluene	118-96-7	30-60	0.1 mg/m ³ (skin)	1.5 mg/m ³ (skin)
RDX	121-82-4	0-30	0.5 mg/m ³ (skin)	1.5 mg/m ³ (skin)
HMX	2691-41-0	0-10	None Established	None Established
Aluminum	7429-90-5	0-15	10 mg/m ³ (dust)	15 mg/m ³ (total)

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

Material Safety Data Sheet

SECTION III - PHYSICAL DATA

Melting Point: 176° F (80° C) (TNT)
Vapor Density: Not applicable
Percent Volatile by Volume: Not applicable
Evaporation Rate (Butyl Acetate = 1): Not applicable

Vapor Pressure: 0.042mm Hg at 80° C (TNT)
Density: 1.55 - 1.65 g/cc
Solubility in Water: < 0.01%

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not applicable

Flammable Limits: Not applicable

Extinguishing Media: (See Special Fire Fighting Procedures section).

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

Eyes: Particulates in the eye may cause irritation, redness, and tearing. Prolonged or repeated contact may cause cataracts, optic neuritis, blurred vision or amblyopia.

Skin: Prolonged contact may cause irritation, severe eczema and sensitization dermatitis. TNT may be absorbed through the skin, which may be indicated by orange staining on exposed skin. See systemic effects below.

Ingestion: Harmful if swallowed. See systemic effects below.

Inhalation: Inhalation of dusts may cause irritation, sneezing or coughing. See systemic effects below.

Systemic or Other Effects: TNT is an irritant, neurotoxin, hepatotoxin, nephrotoxin and bone marrow depressant. Although exposure is unlikely, acute or chronic exposure may cause sensitization dermatitis, headache, dizziness, jaundice, lethargy, or problems with the liver or blood such as toxic nephritis, aplastic anemia, hemolytic anemia or methemoglobin formation. PETN is a known coronary vasodilator, and ingestion or inhalation may result in a lowering of blood pressure, headache or faintness, and a decreased tolerance for grain alcohol. Repeated over-exposure may result in chest pains in the absence of exposure.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Remove contaminated clothing. Wash skin thoroughly with soap and water.

Ingestion: Seek medical attention.

Inhalation: In case of irritation, remove to fresh air. Seek medical attention if chronic symptoms occur.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, friction, impact, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (strong acids and bases or alkalis).

Hazardous Decomposition Products: Nitrogen Oxides (NO_x), Carbon Monoxide (CO)

Hazardous Polymerization: Will not occur.

Material Safety Data Sheet

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Not required for normal handling.

Respiratory Protection: None normally required.

Protective Clothing: Non-permeable gloves and work clothing that reduce skin contact are recommended.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry location. Store in compliance with all Federal, State and local regulations. Keep away from heat, flame, ignition sources or strong shock.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

SECTION X - SPECIAL INFORMATION

This product contains the following substances that are 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.

Chemical Name
None Applicable

CAS Number

% By Weight

Disclaimer

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**Shell Canada Limited**
Material Safety Data Sheet

Effective Date: 2002-11-06

Supersedes: 2002-08-14

Class B3 Combustible Class D2B Other Toxic
Liquid Effects - Skin Irritant**1. PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT: **LOW SUL. DIESEL FUEL MARKED CP -43 - GEN. ELECTRICITY**
SYNONYMS: Diesel
Automotive Gas Oil
PRODUCT USE: Fuel Solvent
MSDS Number: 329-143

MANUFACTURER

Shell Canada Limited
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS

Shell Emergency Number 1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER 613-996-6666
For general information: 1-800-661-1600
For MSDS information: 403-691-3982
(From 7:30 to 4:30 Mountain Time) 403-691-2220

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.

*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Fuels, Diesel, No. 2	68476-34-6	>99	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Red Colour Hydrocarbon Odour

Routes of Exposure: Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

Hazards:

Handling: Combustible Liquid.
Irritating to skin.
Vapours are moderately irritating to the eyes.
Vapours are moderately irritating to the respiratory passages. The liquid when accidentally aspirated into the lungs can cause a severe inflammation of the lung.
Eliminate all ignition sources.
Avoid prolonged exposure to vapours.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY.
Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

Firefighting Instructions: Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Caution - Combustible. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Do not use water except as a fog. Product will float and can be reignited on surface of water. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.

Hazardous Combustion Products: A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Combustible". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Try to work upwind of spill. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling: Combustible. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

North American exposure limits have not been established for the product. Consult local authorities for acceptable provincial values.

Diesel fuel, as total hydrocarbons: 100 mg/m³

Mechanical Ventilation: Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

- Eye Protection:** Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.
- Skin Protection:** Impervious gloves (viton, nitrile) should be worn at all times when handling this material. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.
- Respiratory Protection:** If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Red Colour
Odour:	Hydrocarbon Odour
Odour Threshold:	Not available
Freezing/Pour Point:	Varies with region and season
Boiling Point:	150 - 380 degrees C
Density:	<876 kg/m ³ @ 15 degrees C
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	Not available
pH:	Not available
Flash Point:	Method Pensky-Martens CC >40 degrees C
Lower Explosion Limit:	1 % (vol.)
Upper Explosion Limit:	6 % (vol.)
Autoignition Temperature:	250 degrees C
Viscosity:	1.4 - 4.1 cSt @ 40 degrees C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (K_{ow}):	Not available
Water Solubility:	Insoluble

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Hazardous Decomposition Products:	Thermal decomposition products are highly dependent on combustion conditions.
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified) Toxicological Data

Fuels, Diesel, No. 2

LD50 Oral Rat >5000 mg/kg

LD50 Dermal Rabbit >2000 mg/kg

Routes of Exposure:	Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.
Irritancy:	This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.
Chronic Effects:	Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression.
Pre-existing Conditions:	Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.
Carcinogenicity and Mutagenicity:	The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk. The American Conference of Governmental Industrial Hygienists (ACGIH) has classified this product as A3 - confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

Environmental Effects:	Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May cause physical fouling of aquatic organisms.
Biodegradability:	Not readily biodegradable. Potential for bioaccumulation.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1202
Proper Shipping Name	DIESEL FUEL
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG III
Shipping Description	DIESEL FUEL Class 3 UN1202 PG III

15. REGULATORY INFORMATION

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

WHMIS Class: Class B3 Combustible Liquid
Class D2B Other Toxic Effects - Skin Irritant
DSL/NDSL Status: This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.
Other Regulatory Status: No Canadian federal standards.

16. ADDITIONAL INFORMATION**LABEL STATEMENTS**

Hazard Statement : Combustible Liquid.
Irritating to skin.

Handling Statement: Eliminate all ignition sources.
Avoid prolonged exposure to vapours.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

First Aid Statement : Wash contaminated skin with soap and water.
Flush eyes with water.
If overcome by vapours remove to fresh air.
Do not induce vomiting.
Obtain medical attention.

Revisions: This MSDS has been reviewed and updated.
Changes have been made to:
Section 8
Section 14
Section 11

Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300

Salt Lake City, Utah 84119

Phone: 801-364-4800 Fax: 801-321-6703

E-Mail: dnna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666**MSDS # 1126****Date 01/24/05**

Supersedes

MSDS # 1126 10/20/03

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): PRIMALINE®
PRIMACORD®
PRIMASHEAR™
OPTICORD®
GEOSEIS®
LOW FLEX™
FIRELINE CORD

Product Class: Detonating Cord

Product Appearance & Odor: Flexible cord of woven textile with a protected explosive core of PETN (white crystalline powder) and covered by a white or colored plastic or textile jacket. May have a waxed finish. No odor.

DOT Hazard Shipping Description: Cord, Detonating 1.1D UN0065 II

NFPA Hazard Classification: Not Applicable (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS#	%	<u>Occupational Exposure Limits</u>	
			OSHA PEL-TWA	ACGIH TLV-TWA
Pentaerythritol tetranitrate (PETN)	78-11-5	-----*	None ¹	None ²

¹ Use limit for particulates not otherwise regulated (PNOR): Total dust, 15 mg/m³; respirable fraction, 5 mg/m³.

² Use limit for particulates not otherwise classified (PNOC): Inhalable particulate, 10 mg/m³; respirable part., 3 mg/m³.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

* Core powder is 100% PETN. The approximate amount of PETN in a given grade of cord is expressed as that number of grams of PETN per linear meter of cord. Range is from 1 to 280 gram/meter. Example: PRIMALINE® 5 contains approximately 5 grams PETN per meter of cord. (1 gram/meter = 4.7 grains/foot)

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable (PETN decomposes at melting point, about 141°C)

Vapor Pressure: Not Applicable

Percent Volatile by Volume: Not Applicable

Vapor Density: (Air = 1) Not Applicable

Solubility in Water: Insoluble.

Material Safety Data Sheet

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe, distant location. Allow fire to burn unless it can be fought remotely or with fixed extinguishing systems (sprinklers). For transportation fires involving large quantities of detonating cord, such as a trailer load, evacuate no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning or detonating material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

This is a packaged product that will not result in exposure to the explosive core material under normal conditions of use.

Eyes: May cause irritation, redness and tearing.

Skin: PETN is not known as a skin irritant or sensitizer.

Ingestion: PETN is moderately toxic if ingested. See systemic effects below.

Inhalation: See systemic effects below.

Systemic or Other Effects: PETN is a known coronary vasodilator, and ingestion or inhalation may result in a lowering of blood pressure, headache or faintness, and a decreased tolerance for grain alcohol. Repeated over-exposure may result in chest pains in the absence of exposure. Systemic effects by ingestion include dermatitis.

Carcinogenicity: No constituents are listed by NTP, IARC or OSHA.

Emergency and First Aid Procedures

Eye: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Remove to fresh air. If symptoms persist, seek medical attention.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources, impact, friction, electrostatic discharge and strong shock.

Materials to Avoid (Incompatibility): Corrosives (strong acids and strong bases or alkalis).

Hazardous Decomposition Products: Nitrogen Oxides (NO_x), Carbon Monoxide (CO)

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate all personnel to a safe distant area and allow to burn or fight fire remotely. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If explosive powder is spilled from damaged detonating cord, remove all other explosives from the spill area. Wet down and clean spilled powder using a damp sponge or rag, avoid applying friction or pressure to the explosive, and place in a (Velostat) electrically conductive bag. Contamination of this material with sand, grit or dirt will render the material more sensitive to detonation. If no fire danger is present, and product is undamaged and/or uncontaminated, repack product in original packaging or other

Material Safety Data Sheet

clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Not required for normal handling.

Respiratory Protection: None normally required.

Protective Clothing: Work gloves and work clothing that reduce the possibility of skin abrasion and that would prevent contact with spilled explosive powder is suggested.

Eye Protection: Safety glasses or goggles are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State and local regulations. Only properly qualified and authorized personnel should handle and use explosives. Keep away from heat, flame, ignition sources, impact, friction, electrostatic discharge and strong shock.

Precautions to be taken during use: Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death. Avoid breathing the fumes or gases from detonation of explosives. Detonation in confined or unventilated areas may result in exposure to hazardous fumes or oxygen deficiency.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

SECTION X - SPECIAL INFORMATION

This product contains the following substances that are 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.

<u>Chemical Name</u>	<u>CAS Number</u>	<u>% By Weight</u>
None		

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MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION OF PRODUCT

COMPANY: **Diversity Technologies Corp.** DATE: Jan. 3, 2006
8750 – 53rd Ave. PHONE: 604-940-6050
Edmonton, AB T6E 5G2 FAX: 604-940-6080

PRODUCT NAME: **DR-133 POLYMER**

PRODUCT USE: Drilling mud additive.
CHEMICAL FAMILY: Anionic polyacrylamides in oil-water emulsion CAS#: Mixture

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: B3; D2B
WORKPLACE HAZARD: Combustible liquid; skin and eye irritant

TRANSPORTATION OF DANGEROUS GOODS (TDG)

PROPER SHIPPING NAME: Not regulated under TDG
TDG CLASSIFICATION: Not applicable
UN NUMBER (PIN): Not applicable
PACKING GROUP: Not applicable

SECTION II: HAZARDOUS INGREDIENTS

<u>INGREDIENT</u>	<u>% (v/v)</u>	<u>CAS NUMBER</u>	<u>LD₅₀ Oral-Rat</u>	<u>LC₅₀ Inhal-Rat</u>	<u>ACGIH-TLV</u>
Mineral spirits	30-60	64742-47-8	>5000 mg/kg	Not available	Not established
Alkylphenol ethoxylate	3-7	68412-54-4	3000 mg/kg	Not available	Not established
Ethoxylated C ₁₂₋₁₅ alcohol	0.5-1.5	68131-39-5	>3200 mg/kg	Not available	Not established

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: [XX]EYE CONTACT [XX]SKIN []INHALATION [XX]INGESTION
EYE CONTACT: Severe irritant. Can cause redness, tissue destruction, and irritation.
SKIN CONTACT: Irritant. Low acute dermal toxicity. Can cause redness, inflammation and irritation on prolonged contact.
INGESTION: Low acute oral toxicity. May cause nausea, diarrhea and abdominal cramps.
INHALATION: Not a likely source of exposure.

CARCINOGENICITY: No information available.
TERATOGENICITY: No information available.
REPRODUCTIVE TOXICITY: No information available.
MUTAGENICITY: No information available.
SYNERGISTIC PRODUCTS: No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Wash thoroughly with soap and water. If irritation develops or persists, obtain medical attention. Wash contaminated clothing prior to re-use.
EYE CONTACT: Flush with gently flowing warm water for 15 minutes or until irritation subsides. Obtain medical attention when flushing period is complete.
INGESTION: Do not induce vomiting. Give 1-2 glasses of water. Obtain immediate medical attention. Do not give anything by mouth if patient is unconscious, rapidly losing consciousness or convulsing.
INHALATION: Move to fresh air. Apply oxygen or artificial respiration as required. If breathing difficulties or distress continues obtain medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Liquid emulsion; petroleum odour
SPECIFIC GRAVITY:	Not available
BOILING POINT (°C):	Not available
MELTING POINT (°C):	Not available
SOLUBILITY IN WATER:	Forms gel
PERCENT VOLATILE BY VOLUME:	Not available
EVAPORATION RATE:	Not available
VAPOUR PRESSURE (mmHg):	Not available
VAPOUR DENSITY (air = 1):	Not available
BULK DENSITY:	Not applicable

pH: 7-9 (@ 0.6%)

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 65°C (TCC)
FLAMMABLE LIMITS: Not applicable
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam, in preference to a water spray.
SPECIAL FIRE FIGHTING PROCEDURES: Self contained breathing apparatus required for fire fighting personnel. Move containers from fire area, or cool with water spray, if possible.

**UNUSUAL FIRE AND
EXPLOSION HAZARDS:**

Vapours may travel to ignition source and flash back.

SECTION VII: REACTIVITY DATA

STABILITY:	STABLE [XX]	UNSTABLE []
INCOMPATIBILITY (CONDITIONS TO AVOID):	Avoid contact with strong oxidizers and strong reducing agents. Avoid ignition sources.	
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxides of carbon and nitrogen upon combustion	
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR [XX]	MAY OCCUR []

SECTION VIII: PREVENTATIVE MEASURES**SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION:	Use approved respirators with organic vapour cartridges if TLV is exceeded.
VENTILATION:	Use in well-ventilated area, or use local exhaust ventilation, process enclosure or other engineering controls to maintain vapour/mist level below TLV.
PROTECTIVE GLOVES:	Neoprene or viton recommended.
EYE PROTECTION:	Wear chemical goggles when handling.
OTHER PROTECTIVE EQUIPMENT (Specify):	As necessary to prevent contact. Ensure eyewash station and emergency shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid all contact with material. Remove contaminated clothing; launder or dry-clean before re-use. Cleanse skin thoroughly after contact, before breaks and meals and at end of work period. Product is readily removed from skin by washing thoroughly with soap and water. Store in a cool, dry location away from incompatibles. Store in original container. Empty packages contain residual hazardous material; handle and store as if full.

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Use appropriate safety equipment. Eliminate ignition sources. Stop leak if possible to do so without risk. Dike spill to prevent spread. Use vacuum to pick up large spills. Soak up residual and small spills with absorbent materials. Collect uncontaminated material for repackaging. Collect contaminated material and absorbents in appropriate container for disposal.

WASTE DISPOSAL METHOD

Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine if material meets the criteria of hazardous waste at the time of disposal.

SECTION IX: PREPARATION

THE INFORMATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH,
BUT NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DATE ISSUED: January 3, 2006

BY: Product safety committee

SUPERSEDES: March 31, 2003

PHONE: 780-440-4923

Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300

Salt Lake City, Utah 84119

Phone: 801-364-4800 Fax: 801-321-6703

E-Mail: dnna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666**MSDS # 1076****Date 01/24/05**

Supersedes

MSDS # 1076 01/22/03

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): ELECTRIC SUPER™ COAL
ELECTRIC SUPER™ LP
ELECTRIC SUPER™ SP
ELECTRIC SUPER™ SEISMIC
ELECTRIC SUPER™ INSTANT

Product Class: Commercial Electric Detonators and Accessory Products

Product Appearance & Odor: Metal cylinder with varying length of attached plastic coated wires.

DOT Hazard Shipping Description: Detonators, Electric 1.1B UN0030 II
Or
Detonators, Electric 1.4B UN0255 II
Or
Detonators, Electric 1.4S UN0456 II

NFPA Hazard Classification: Not Applicable (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS#	<u>EXPOSURE LIMITS</u>	
		OSHA PEL-TWA	ACGIH TLV-TWA
Tungsten	7440-33-7	None ¹	5 mg/m ³ (TWA) 10 mg/m ³ (STEL)
Barium Chromate	10294-40-3	1 mg (CrO ₃)/10m ³ (ceiling)	0.01 mg (Cr)/m ³
Lead Compounds	-----	0.5 mg (Ba)/m ³ 0.5 mg (Pb)/m ³	0.5 mg (Ba)/m ³ 0.5 mg (Pb)/m ³
Pentaerythritol Tetranitrate (PETN)	78-11-5	None ¹	None ²
Boron	7440-42-8	No Value Established	No Value Established
Potassium Perchlorate ³	7778-74-7	None ¹	None ²
Diazodinitrophenol (DDNP)	4682-03-5	No Value Established	No Value Established
Nitrocellulose	9004-70-0	No Value Established	No Value Established

¹ Use limit for particulates not otherwise regulated (PNOR): Total dust, 15 mg/m³; respirable fraction, 5 mg/m³.

² Use limit for particulates not otherwise classified (PNOC): Inhalable particulate, 10 mg/m³; respirable part., 3 mg/m³.

³ Not all delay periods contain perchlorate. Those that do contain between from about 4 to a maximum of about 25 mg perchlorate per detonator.

Material Safety Data Sheet

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable
Vapor Density: Not Applicable
Percent Volatile by Volume: Not Applicable

Vapor Pressure: Not Applicable
Density: Not Applicable
Solubility in Water: Not Applicable

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: None

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

This is a packaged product that will not result in exposure to the explosive material under normal conditions of use. Exposure concerns are primarily with post-detonation reaction products, particularly heavy metal compounds.

Eyes: No exposure to chemical hazards anticipated with normal handling procedures. Particulates in the eye may cause irritation, redness and tearing.

Skin: No exposure to chemical hazards anticipated with normal handling procedures.

Ingestion: No exposure to chemical hazards anticipated with normal handling procedures.

Inhalation: Not a likely route of exposure.

Systemic or Other Effects: None anticipated with normal handling procedures. Repeated inhalation or ingestion of post-detonation reaction products may lead to systemic effects such as respiratory tract irritation, ringing of the ears, dizziness, elevated blood pressure, blurred vision and tremors. Heavy metal (lead) poisoning can occur.

Carcinogenicity: ACGIH classifies Lead as a "Suspected Human Carcinogen" and insoluble Chromium VI as "Confirmed Human Carcinogen". NTP, OSHA, and IARC consider components contained in this detonator carcinogenic.

Perchlorate: Perchlorate can potentially inhibit iodide uptake by the thyroid and result in a decrease in thyroid hormone. The National Academy of Sciences (NAS) has reviewed the toxicity of perchlorate and has concluded that even the most sensitive populations could ingest up to 0.7 microgram perchlorate per kilogram of body weight per day without adversely affecting health. The USEPA must establish a maximum contaminant level (MCL) for perchlorate in drinking water by 2007, and this study by NAS may result in a recommendation of about 20 ppb for the MCL.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Not applicable.

Special Considerations: None

Material Safety Data Sheet

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources, strong shock and electrical impulse. Do not attempt to disassemble.

Materials to Avoid (Incompatibility): Corrosives (acids and bases)

Hazardous Decomposition Products: Carbon Monoxide (CO), Nitrous Oxides (NO_x), Lead (Pb) and various oxides and complex oxides of metals.

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Not required for normal handling.

Respiratory Protection: None normally required.

Protective Clothing: Cotton clothing is suggested.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State, and local regulations. Keep away from heat, flame, ignition sources, strong shock, and electrical impulses.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

Material Safety Data Sheet

SECTION X - SPECIAL INFORMATION

This product contains the following substances that are 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.

<u>Chemical Name</u>	<u>CAS Number</u> (Use Toxic Chemical Category Code)	<u>% By Weight</u>
Barium Compounds	N040	1.2
Lead Compounds	N420	0 – 0.59
Chromium Compounds	N090	1.2

Amount of Lead in Detonator Product Line *				
Product	Pb compounds in detonator [grams]	Pb compounds in detonator [Wt.%]	Pb in detonator [grams]	Pb in detonator [Wt. %]
Electric Super SP	0.0412	0.588%	0.0357	0.5093%
Electric Super LP	0.0412	0.588%	0.0357	0.5093%
Electric Super Coal	0.0412	0.588%	0.0357	0.5093%
Electric Super Seismic	0.0000	0.0000%	0.0000	0.0000%
Electric Super Instant	0.0000	0.0000%	0.0000	0.0000%

*Applies to only the detonator (source of lead). Do not use case weight or weight of any other component.

Disclaimer

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MATERIAL SAFETY DATA SHEET

Product Trade Name: **EZ-MUD®**

Revision Date: 16-Feb-2004

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: EZ-MUD®
Synonyms: None
Chemical Family: Blend
Application: Shale Inhibitor

Manufacturer/Supplier: Baroid Drilling Fluids
a Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (800) 666-9260 or (713) 753-3000

Prepared By: Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Hydrotreated light petroleum distillate	64742-47-8	10 - 30%	200 mg/m ³	Not applicable

3. HAZARDS IDENTIFICATION

Hazard Overview: May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be harmful if swallowed.

4. FIRST AID MEASURES

Inhalation If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Skin Wash with soap and water. Get medical attention if irritation persists. Remove contaminated shoes and discard.

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	> 200Min: > 200
Flash Point/Range (C):	Not DeterminedMin: > 93
Flash Point Method:	PMCC
Autoignition Temperature (F):	> 392
Autoignition Temperature (C):	> 200
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media Water fog, carbon dioxide, foam, dry chemical.

Special Exposure Hazards Decomposition in fire may produce toxic gases. Use water spray to cool fire exposed surfaces.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

NFPA Ratings: Health 2, Flammability 1, Reactivity 0
HMIS Ratings: Flammability 1, Reactivity 0, Health 2

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Storage Information Store away from oxidizers. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

Respiratory Protection Organic vapor respirator with a dust/mist filter. In high concentrations, supplied air respirator or a self-contained breathing apparatus.

Hand Protection Impervious rubber gloves.

Skin Protection Rubber apron.

Eye Protection Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Color: White to gray
Odor: Mild hydrocarbon
pH: 6-8

Specific Gravity @ 20 C (Water=1):	1.0
Density @ 20 C (lbs./gallon):	8.3
Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	347
Boiling Point/Range (C):	175
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	0.002
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	70
Evaporation Rate (Butyl Acetate=1):	< 1
Solubility in Water (g/100ml):	Partially soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	Keep away from heat, sparks and flame.
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Ammonia. Oxides of nitrogen. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
Skin Contact	May cause skin irritation.
Eye Contact	May cause severe eye irritation.
Ingestion	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions.
Aggravated Medical Conditions	Lung disorders.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	BOD(28 Day): 40% of COD
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	TLM96: >1000 mg/l (Pimephales promelas)
Acute Crustaceans Toxicity:	TLM48: 98 mg/l (Acartia tonsa)
Acute Algae Toxicity:	EC50: 16.70 mg/l (Skeletonema costatum)

Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	If empty container retains product residues, all label precautions must be observed. Store away from ignition sources. Transport with all closures in place. Return for reuse or disposal according to national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class Acute Health Hazard

EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity For This Product Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 All components listed do not apply to the California Proposition 65 Regulation.

MA Right-to-Know Law Does not apply.

NJ Right-to-Know Law Does not apply.

PA Right-to-Know Law Does not apply.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory.

WHMIS Hazard Class D2B Toxic Materials

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS

Not applicable

Additional Information For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

**Shell Canada Limited**
Material Safety Data Sheet

Effective Date: 2002-08-14

Supersedes: 2001-01-08

Class B2 Flammable
LiquidClass D2A Other Toxic
Effects - Carcinogen**1. PRODUCT AND COMPANY IDENTIFICATION****PRODUCT: REGULAR UNLEADED GASOLINE MARKED****SYNONYMS:** Automotive Fuel
Petrol**PRODUCT USE:** Fuel**MSDS Number:** 215-002**MANUFACTURER****Shell Canada Limited**
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5**TELEPHONE NUMBERS****Shell Emergency Number**

1-800-661-7378

CANUTEC 24 HOUR EMERGENCY NUMBER

613-996-6666

For general information:

1-800-661-1600

For MSDS information:

403-691-3982

(From 7:30 to 4:30 Mountain Time)

403-691-2220

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.

*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Gasoline, Natural	8006-61-9	80 - 100	Yes
Benzene	71-43-2	<1.5	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION**Physical Description:** Liquid Dyed for tax purposes Typical Gasoline Odour**Routes of Exposure:** Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

Hazards:

Flammable Liquid.
May cause cancer.
Vapours are moderately irritating to the eyes.
Ingestion may result in vomiting. Avoid aspiration of vomitus into lungs as small quantities may result in aspiration pneumonitis.
May be absorbed by skin contact. Prolonged immersion in liquid may lead to chemical burns.
Vapours are moderately irritating to the respiratory passages. The liquid when accidentally aspirated into the lungs can cause a severe inflammation of the lung.
Excessive exposure to benzene may cause leukemia in man.

Handling:

Eliminate all ignition sources.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Avoid prolonged exposure to vapours.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

- Firefighting Instructions:** Extremely flammable. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Do not use water except as a fog. Product will float and can be reignited on surface of water. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.
- Hazardous Combustion Products:** Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Flammable". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Try to work upwind of spill. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations.

7. HANDLING AND STORAGE

- Handling:** Extremely flammable. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Avoid all direct contact with this material. Avoid prolonged or repeated inhalation of vapours. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Never siphon by mouth. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Launder contaminated clothing prior to reuse. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities.
- Storage:** Store in a cool, dry, well ventilated area, away from heat and ignition sources. Protect against physical damage to containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Gasoline: 300 ppm (STEL: 500 ppm)

Benzene (skin) : 0.5 ppm (STEL: 2.5 ppm)

Skin Notation: The occupational exposure limit is based on the fact that skin and/or eye is a major route of exposure through absorption.

Mechanical Ventilation: Use explosion-proof ventilation as required to control vapour concentrations. Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Impervious gloves should be worn at all times when handling this product. PVC or nitrile rubber gloves are recommended. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Dyed for tax purposes
Odour:	Typical Gasoline Odour
Odour Threshold:	>0.25 ppm
Freezing/Pour Point:	Not available
Boiling Point:	35 - 220 degrees C
Density:	750 - 850 kg/m ³ @ 15 degrees C
Vapour Density (Air = 1):	3.5
Vapour Pressure (absolute):	Not available
pH:	Not applicable
Flash Point:	Method Tag Closed Cup = -30 degrees C
Lower Explosion Limit:	1.4 % (vol.)
Upper Explosion Limit:	7.6 % (vol.)
Autoignition Temperature:	280 degrees C
Viscosity:	<1 cSt @ 38 degrees C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (K_{ow}):	200
Water Solubility:	Insoluble

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION**Ingredient (or Product if not specified) Toxicological Data**

Gasoline, Natural

LD50 Oral Rat = 18800 mg/kg

LD50 Dermal Rabbit >8000 mg/kg

Benzene

LD50 Oral Rat = 930 - 5600 mg/kg

LC50 Inhalation Rat = 13700 ppm for 4 hours

Routes of Exposure: Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

Irritancy: Based on testing with similar materials, this product is not expected to be a primary skin irritant after exposure of short duration, would not be a skin sensitizer and would not be irritating to the eye.

Chronic Effects: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression. Prolonged and repeated exposure may cause serious injury to blood forming organs, resulting in anemia and similar conditions.

Carcinogenicity and Mutagenicity: This product contains benzene. Epidemiological studies indicate that long term inhalation of benzene vapour can cause leukaemia in man. Benzene has also produced chromosomal aberrations in peripheral blood lymphocytes.

12. ECOLOGICAL INFORMATION

Environmental Effects: Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May be harmful to aquatic life. Fish Toxicity: 5 to 40 ppm | 96 hr TLM | Rainbow Trout | Freshwater

Biodegradability: Not readily biodegradable. Potential for bioaccumulation. Rapid volatilization.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORTATION INFORMATION**Canadian Road and Rail Shipping Classification:**

UN Number	UN1203
Proper Shipping Name	GASOLINE
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG II

Additional Information	Marine Pollutant
Shipping Description	GASOLINE Class 3 UN1203 PG II
	Marine Pollutant

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B2 Flammable Liquid Class D2A Other Toxic Effects - Carcinogen
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act.
Other Regulatory Status:	No Canadian federal standards.

16. ADDITIONAL INFORMATION

LABEL STATEMENTS

Hazard Statement :	Flammable Liquid. May cause cancer.
Handling Statement:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Avoid prolonged exposure to vapours. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.
Revisions:	This MSDS has been reviewed and updated. Changes have been made to: Section 1 Section 2 Section 14

**Shell Canada Limited**
Material Safety Data Sheet

Effective Date: 2005-08-15

Supersedes: 2002-08-14

Class B3 Combustible Class D2B Other Toxic
Liquid Effects - Skin Irritant**1. PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT: **SHELL* JET A-1**
SYNONYMS: Aviation Turbine Fuel (Kerosene Type)
May contain anti-icing additive (Diethylene Glycol Monomethyl Ether)
PRODUCT USE: Fuel Solvent
MSDS Number: 142-011

MANUFACTURER

Shell Canada Limited
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS

Shell Emergency Number 1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER 613-996-6666
For general information: 1-800-661-1600
For MSDS information: 403-691-3982
(From 7:30 to 4:30 Mountain Time) 403-691-2220

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.

*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Kerosene (Petroleum), Hydrodesulfurized	64742-81-0	60 - 100	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Bright Clear Hydrocarbon Odour

Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.

Hazards:

Combustible Liquid.
Irritating to skin.
Vapours are moderately irritating to the eyes.
Ingestion may result in vomiting. Avoid aspiration of vomitus into lungs as small quantities may result in aspiration pneumonitis.
Vapours are moderately irritating to the respiratory passages.

Handling: Eliminate all ignition sources.
Avoid prolonged exposure to vapours.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY.
Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Carbon Dioxide
Foam
Dry Chemical
Water Fog

Firefighting Instructions: Caution - Combustible. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Product will float and can be reignited on surface of water. Do not use a direct stream of water as it may spread fire. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.

Hazardous Combustion Products: A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Combustible". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Try to work upwind of spill. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling: Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene. Combustible.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Kerosene/Jet fuels, as total hydrocarbon vapour (skin) : 200 mg/m³ (Application restricted to conditions in which there are negligible aerosol exposures.)

Skin Notation: Absorption through skin, eyes and mucous membranes may contribute significantly to the total exposure.

Mechanical Ventilation: Use explosion-proof ventilation as required to control vapour concentrations. Concentrations in air should be maintained below the recommended threshold limit value if unprotected personnel are involved. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Avoid contact with skin. Use protective clothing and gloves manufactured from nitrile. Safety showers should be available for emergency use.

Respiratory Protection: Avoid breathing vapour or mists. If exposure has the potential to exceed occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator.

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Bright Clear
Odour:	Hydrocarbon Odour
Odour Threshold:	Not available
Freezing/Pour Point:	Freeze Point < -47 °C
Boiling Point:	145 - 300 °C
Density:	775 - 840 kg/m3 @ 15 °C
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	1 - 1.4 kPa @ 37.8 °C
pH:	Not available
Flash Point:	Tag Closed Cup > 43 °C
Lower Explosion Limit:	0.7 % (vol.)
Upper Explosion Limit:	5 % (vol.)
Autoignition Temperature:	210 °C
Viscosity:	< 8 cSt @ -20 °C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (log K_{ow}):	3.3 - 6
Water Solubility:	Insoluble
Other Solvents:	Hydrocarbon Solvents

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Hazardous Decomposition Products:	Thermal decomposition products are highly dependent on combustion conditions.
Incompatible Materials:	Avoid strong oxidizing agents.

Conditions of Reactivity:

Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION**Ingredient (or Product if not specified) Toxicological Data**

Kerosene (Petroleum), Hydrodesulfurized LD50 Dermal Rabbit > 2000 mg/kg
LD50 Oral Rat > 5000 mg/kg

Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.

Irritancy: This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.

Chronic Effects: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression.

Pre-existing Conditions: Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

Carcinogenicity and Mutagenicity: The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk.

12. ECOLOGICAL INFORMATION

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May cause physical fouling of aquatic organisms.

Biodegradability: Not readily biodegradable.
Rapid volatilization.

Bioaccumulation: Potential for bioaccumulation.

Partition Coefficient (log K_{OW}): 3.3 - 6

Aquatic Toxicity

Product is expected to be toxic to aquatic organisms.

Ingredient:	Toxicological Data
Kerosene	EL50 - growth rate (WAF method) Algae (72hr) 1 - 10 mg/L.
(Petroleum),	EL50 (WAF method) Daphnia Magna (48hr) 1 - 10 mg/L.
Hydrodesulfurized	LL50 (WAF method) Rainbow Trout (96hr) 1 - 10 mg/L.

Definition(s): LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances.

WAF is the water accommodated fraction. A slightly soluble hydrocarbon is stirred into water and the insoluble portions are removed. The remaining solution is the water accommodated fraction.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1863
Proper Shipping Name	FUEL, AVIATION, TURBINE ENGINE
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG III
Additional Information	Not Regulated in Containers Less Than or Equal to 450 Litres.
Shipping Description	FUEL, AVIATION, TURBINE ENGINE Class 3 UN1863 PG III Not Regulated in Containers Less Than or Equal to 450 Litres.

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B3 Combustible Liquid Class D2B Other Toxic Effects - Skin Irritant
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act.
Other Regulatory Status:	No Canadian federal standards.

16. ADDITIONAL INFORMATION

LABEL STATEMENTS

Hazard Statement : Combustible Liquid.
Irritating to skin.

Handling Statement: Eliminate all ignition sources.
Avoid prolonged exposure to vapours.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Empty containers are hazardous, may contain flammable / explosive dusts,
liquid residue or vapours. Keep away from sparks and open flames.

First Aid Statement : Wash contaminated skin with soap and water.
Flush eyes with water.
If overcome by vapours remove to fresh air.
Do not induce vomiting.
Obtain medical attention.

Revisions: This MSDS has been reviewed and updated.
Changes have been made to:
Section 3
Section 4
Section 5
Section 7
Section 8
Section 9
Section 12
Section 14

ADG Technology

PERTH

Tel (08) 9249 7599

Fax (08) 9249 7699

BRISBANE

Tel (07) 3271 5900

Fax (07) 3271 5907



Southern Exploration & Drilling Supplies

MELBOURNE

Tel (03) 9545 1277

Fax (03) 9545 1299

INTERNATIONAL

Tel +61 (8) 9249 7599

Fax +61 (8) 9249 7699

PO Box 148,

Kingsway WA 6065

Material Safety Data Sheet

Lubtac Rod Grease



Down hole hammers & bits
Top hole hammer equipment



Diamond drilling
Three cone rotary drill bits
(TCI or Mill Tooth)
Geological supplies
Radio communications
Drag & blade bits
Drilling fluids
Drilling rigs - all types
Elgi air compressors
Augers, teeth,
ground engaging tools
Drill pipe & subs
Geotechnical drilling supplies
International procurement
Machinery parts & equipment



A Smith/Schlumberger Company

M-I Australia Pty Ltd, 11/251 Adelaide Tce, Perth, WA, 6000
Tel: 08 9325 4822 Fax: 08 9325 1897



MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data is obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions in which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, neither warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

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ENVIRONMENTAL AND SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

TRADE NAME: LUBTAC ROD GREASE

GENERIC DESCRIPTION: A MIXTURE OF INORGANIC INERT VISCOSIFIERS, TACKIFIERS, HYDROCARBON OILS AND VEGETABLE OILS.

2. HAZARDOUS INGREDIENTS

MATERIAL COMPONENT	OR	%	DATA
NONE			

3. PHYSICAL DATA

BOILING POINT : 120 °C

MELTING POINT : NA

FREEZING POINT : < 0 °C

pH : 7-8

SPECIFIC GRAVITY : 0.99

APPEARANCE AND : DARK BROWN STRINGY GREASE

4. FIRE AND EXPLOSION DATA

FLASH POINT °C: (AUTO IGNITION TEMPERATURE) > 200 °C

EXTINGUISHING MEDIA : USE EXTINGUISHER USED FOR EXTINGUISHING HYDROPHOBIC MATERIALS

5. HEALTH HAZARD INFORMATION

ROUTES OF EXPOSURE AND EFFECTS

EYES : MODERATE TO SEVERE IRRITATION

INHALATION : NO IRRITATING FUMES ARE PRODUCED AT NORMAL
TEMPERTURES

INGESTION : MAY CAUSE NAUSEA

SKIN : MAY BE IRRITATING TO SENSITIVE SKINS ON
PROLONGED EXPOSURE

6. EMERGENCY AND FIRST AID PROCEDURES

EYES : WIPE OUT WITH DRY CLOTH. USE EYE DROPS IF NECESSARY.
OBTAIN MEDICAL ATTENTION IF NECESSARY

INHALATION : NO IRRITATING FUMES ARE PRODUCED AT NORMAL
TEMPERATURES

INGESTION : WASH MOUTH WITH WATER. INDUCE VOMITING. OBTAIN
MEDICAL ADVICE AS SOON AS POSSIBLE

SKIN : WASH WITH SOAPY WATER. IF DEGREASING OF SKIN HAS
OCCURED, APPLY MOISTURISING CREAM

7. REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY: EXTREME HEAT

INCOMPATABILITY: NONE

HAZARDOUS DECOMPOSITION PRODUCTS: CAN PRODUCE HYDROCARBON
DECOMPOSITION PRODUCT ON BURNING.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERISATION: WILL NOT
OCCUR

8. SPILL OR LEAK PROCEDURES

CONTAIN SPILL. SCRAPE UP EXCESS PRODUCTS WITH A SPADE. THROW SAND OR WOOD SHAVINGS OVER CONTAMINATED AREA AND SCRAPE UP WITH ASPADE. CONTAMINATED WOOD SHAVINGS OR SAND CAN BE DISCARDED IN ANY RUBBISH STORAGE AREA.

9. INDUSTRIAL HYGEINE CONTROL MEASURES

VENTILATION: **NORMAL**

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY:	NONE
EYES :	NONE
GLOVES :	YES
OTHER :	CLOTHING PROTECTOR AS REQUIRED TO PROTECT CLOTHES FROM GREASE WHICH IS DIFFICULT TO REMOVE.

10. SPECIAL PRECAUTIONS

NONE

11. OTHER HANDLING AND STORAGE REQUIREMENTS

NONE

Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300

Salt Lake City, Utah 84119

Phone: 801-364-4800 Fax: 801-321-6703

E-Mail: dnna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666**MSDS # 1122****Date 05/13/05**

Supersedes

MSDS # 1122 01/24/05

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): NONEL[®] MS
NONEL[®] LP
NONEL[®] SL
NONEL[®] TD
NONEL[®] MS CONNECTOR
NONEL[®] TWINPLEX[™]
NONEL[®] STARTER

NONEL[®] EZ DET[®]
NONEL[®] EZTL[™]
NONEL[®] EZ DRIFTER[®]
OPTIMIZER[®] OPTISLIDE[®]
OPTIMIZER[®] OPTISURFACE[®]
OPTIMIZER[®] OPTI-TL[®]

Product Class: NONEL[®] Non-electric Delay Detonators**Product Appearance & Odor:** Aluminum cylindrical shell with varying length and diameter of attached colored plastic tubing. The detonator may be enclosed in a plastic housing, and an assembly may contain two detonators. Odorless.

DOT Hazard Shipping Description: Detonators, non-electric 1.1B UN0029 II
-or- Detonator assemblies, non-electric 1.1B UN0360 II
-or- Detonator assemblies, non-electric 1.4B UN0361 II

NFPA Hazard Classification: Not Applicable (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Occupational Exposure Limits

Ingredients	CAS#	OSHA PEL-TWA	ACGIH TLV-TWA
Pentaerythritol Tetranitrate (PETN)	78-11-5	None ¹	None ²
Lead Azide	13424-46-9	0.05 mg (Pb)/m ³	0.05 mg (Pb)/m ³
Lead	7439-92-1	0.05 mg (Pb)/m ³	0.05 mg (Pb)/m ³
Silicon	7440-21-3	15 mg / m ³ (total dust) 5 mg / m ³ (respirable fraction)	10 mg / m ³
Selenium	7782-49-2	0.2 mg/m ³	0.2 mg/m ³
Red Lead (Lead tetroxide)	1314-41-6	0.05 mg (Pb)/m ³	0.05 mg (Pb)/m ³
Titanium dioxide	13463-67-7	15 mg/m ³	10 mg/m ³
Barium Chromate	10294-40-3	1 mg (CrO ₃)/10m ³ (ceiling)	0.01 mg (Cr)/m ³
Lead Chromate	7758-97-6	0.5 mg (Ba)/m ³ 0.05 mg (Pb)/m ³ 1 mg (CrO ₃)/10m ³ (ceiling)	0.5 mg (Ba)/m ³ 0.15 mg (Pb)/m ³ 0.012 mg (Cr)/m ³
Barium Sulfate	7727-43-7	0.5 mg (Ba)/m ³	10 mg/m ³
Potassium Perchlorate ³	7778-74-7	None ¹	None ²
Silica (crystalline)	61790-53-2	See Note Below	0.05 mg/m ³ (resp frac)
Molybdenum	7439-98-7	None ¹	None ²

Material Safety Data Sheet

Tungsten	7440-33-7	None ¹	5 mg/m ³ (TWA) 10 mg/m ³ (STEL)
Aluminum	7429-90-5	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)	5 mg/m ³
Antimony	7440-36-0	0.5 mg/m ³	0.5 mg/m ³
Cyclotetramethylene Tetranitramine (HMX)	2691-41-0	None ¹	None ²

¹ Use limit for particulates not otherwise regulated (PNOR): Total dust, 15 mg/m³; respirable fraction, 5 mg/m³.

² Use limit for particulates not otherwise classified (PNOC): Inhalable particulate, 10 mg/m³; respirable part., 3 mg/m³.

Note: The OSHA PEL for crystalline silica is calculated as follows:

Quartz, respirable: 10 mg/m³ / % SiO₂ + 2 Quartz, total dust: 30 mg/m³ / % SiO₂ + 2

³ Not all delay periods contain perchlorate. Those that do contain between from about 4 to a maximum of about 60 mg perchlorate per detonator.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable

Vapor Density: Not Applicable

Percent Volatile by Volume: Not Applicable

Evaporation Rate (Butyl Acetate = 1): Not Applicable

Vapor Pressure: Not Applicable

Density: Not Applicable

Solubility in Water: Not Applicable

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe, distant location. Allow fire to burn unless it can be fought remotely or with fixed extinguishing systems (sprinklers).

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

This is a packaged product that will not result in exposure to the explosive material under normal conditions of use. Exposure concerns are primarily with post-detonation reaction products, particularly heavy metal compounds.

Eyes: No exposure to chemical hazards anticipated with normal handling procedures. Particulates in the eye may cause irritation, redness, swelling, itching, pain and tearing.

Skin: No exposure to chemical hazards anticipated with normal handling procedures. Exposure to post-detonation reaction products may cause irritation.

Ingestion: No exposure to chemical hazards anticipated with normal handling procedures. Post-detonation reaction product residue is toxic by ingestion. Symptoms may include gastroenteritis with abdominal pain, nausea, vomiting and diarrhea. See systemic effects below.

Material Safety Data Sheet

Inhalation: Not a likely route of exposure. See systemic effects below.

Systemic or Other Effects: None anticipated with normal handling procedures. Repeated inhalation or ingestion of post-detonation reaction products may lead to systemic effects such as respiratory tract irritation, ringing of the ears, dizziness, elevated blood pressure, blurred vision and tremors. Heavy metal (lead) poisoning can occur.

Carcinogenicity: ACGIH classifies Lead as a "Suspected Human Carcinogen" and insoluble Chromium VI as "Confirmed Human Carcinogen". NTP, OSHA, and IARC consider components contained in this detonator carcinogenic.

Perchlorate: Perchlorate can potentially inhibit iodide uptake by the thyroid and result in a decrease in thyroid hormone. The National Academy of Sciences (NAS) has reviewed the toxicity of perchlorate and has concluded that even the most sensitive populations could ingest up to 0.7 microgram perchlorate per kilogram of body weight per day without adversely affecting health. The USEPA must establish a maximum contaminant level (MCL) for perchlorate in drinking water by 2007, and this study by NAS may result in a recommendation of about 20 ppb for the MCL.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Not applicable.

Special Considerations: None

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact.

Conditions to Avoid: Keep away from heat, flame, ignition sources, impact, friction, electrostatic discharge and strong shock. Do not attempt to disassemble.

Materials to Avoid (Incompatibility): Corrosives (acids and bases or alkalis).

Hazardous Decomposition Products: Carbon Monoxide (CO), Nitrous Oxides (NO_x), Sulfides, Chromates, Lead (Pb), Antimony (Sb) and various oxides and complex oxides of metals.

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate all personnel to a safe distant area and allow to burn or fight fire remotely. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. If loose explosive powder is spilled, such as from a broken detonator, only properly qualified and authorized personnel should be involved with handling and clean-up activities. Spilled explosive powder is extremely sensitive to initiation and may detonate. Follow applicable Federal, State, and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

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SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: None required for normal handling. Provide enhanced ventilation after use if in underground mines or other enclosed areas.

Respiratory Protection: None required for normal handling.

Protective Clothing: Cotton gloves are recommended.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State, and local regulations. Only properly qualified and authorized personnel should handle and use explosives. Keep away from heat, flame, ignition sources, impact, friction, electrostatic discharge and strong shock.

Precautions to be taken during use: Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death. Avoid breathing the fumes or gases from detonation of explosives. Detonation in confined or unventilated areas may result in exposure to hazardous fumes or oxygen deficiency.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

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SECTION X - SPECIAL INFORMATION

These products contain the following substances that are 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.

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Max. lbs/1000 units</u>
Lead	7439-92-1	39.4
(Use Toxic Chemical Category Code)		
Lead Compounds	N420	2.0
Barium Compounds	N040	1.8
Chromium Compounds	N090	1.9

Range* of Section 313 Chemicals in each product

Product	lb Pb per 1000 detonators	lb Pb compounds per 1000 detonators	lb Ba compounds per 1000 detonators	lb Cr compounds per 1000 detonators
NONEL [®] MS	0 - 27	0.3 - 1.5	0 - 0.9	0 - 0.9
NONEL [®] LP	0 - 30	0.3 - 2.0	0 - 1.8	0 - 1.9
NONEL [®] SL	7 - 27	0.3 - 1.5	0	0
NONEL [®] TD	0 - 18	0.3 - 0.7	0	0
NONEL [®] MS Connector	5 - 16	0.3 - 0.4	0	0
NONEL [®] TWINPLEX [™]	5 - 15	0.3 - 0.7	0	0
NONEL [®] STARTER	0	0.3	0	0
NONEL [®] EZ DET [®]	22 - 36	2.0	0	0
NONEL [®] EZTL [™]	5 - 15	0.5 - 0.7	0	0
NONEL [®] EZ DRIFTER	39.4	1.3	1.2	1.3
NONEL [®] OPTISLIDE [®]	0	0	0	0
NONEL [®] OPTISURFACE [®]	0	0	0	0
NONEL [®] OPTI-TL [®]	0	0	0	0

* The exact quantity and weight percent of Section 313 Chemicals in each delay period and tubing length for each product is available upon request.

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Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300
Salt Lake City, Utah 84119
Phone: 801-364-4800 Fax: 801-321-6703
E-Mail: dnna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666

MSDS # 1063**Date 01/24/05**

Supersedes

MSDS # 1063 01/23/04

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): BLASTEX®
BLASTEX® PLUS, BLASTEX® PLUS HD
BLASTEX® TX, BLASTEX® TX PLUS
SUPER BLASTEX®, SUPER BLASTEX® TX
DYNOTEX
DYNO® 1.5 SB, DYNO® 1.5 SBC, DYNO® 1.5 SB30
DX-2011, DX-2012

Product Class: Packaged Emulsion Explosives

Product Appearance & Odor: White or pink opaque semi-solid, which will appear gray if product contains aluminum.

Little or no odor. Packaged in cylindrical cartridges of paper or plastic film.

DOT Hazard Shipping Description: Explosive, blasting, type E 1.5D UN0332 II

NFPA Hazard Classification: Not Applicable (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	ACGIH TLV-TWA
Ammonium Nitrate	6484-52-2	60-85	No Value Established
Sodium Nitrate ¹	7631-99-4	0-12	No Value Established
Aluminum	7429-90-5	0-10	10 mg/m ³
Mineral Oil	64742-35-4	0-6	5 mg/m ³
Kerosene	8008-20-6	0-6	No Value Established

¹ Our source of Sodium Nitrate (Chilean) may contain perchlorate ion, which occurs naturally. Although Dyno Nobel does not analyze for the presence of perchlorate anion, based on published studies, the products listed above may contain between 0 and 250 ppm perchlorate.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

Material Safety Data Sheet

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable
Vapor Density: (Air = 1) Not Applicable
Percent Volatile by Volume: <20 (water)

Vapor Pressure: Not Applicable
Density: 1.15-1.35 g/cc
Solubility in Water: Product partially dissolves very slowly in water.

Evaporation Rate (Butyl Acetate = 1): <1

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: >100°C

Flammable Limits: Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

Eyes: May cause irritation, redness and tearing.

Skin: Prolonged contact may cause irritation.

Ingestion: Large amounts may be harmful if swallowed.

Inhalation: Not a likely route of exposure.

Systemic or Other Effects: *Perchlorate:* Perchlorate can potentially inhibit iodide uptake by the thyroid and result in a decrease in thyroid hormone. The National Academy of Sciences (NAS) has reviewed the toxicity of perchlorate and has concluded that even the most sensitive populations could ingest up to 0.7 microgram perchlorate per kilogram of body weight per day without adversely affecting health. The USEPA must establish a maximum contaminant level (MCL) for perchlorate in drinking water by 2007, and this study by NAS may result in a recommendation of about 20 ppb for the MCL.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least 15 minutes. If irritation persists seek medical attention.

Skin: Remove contaminated clothing. Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: If irritation occurs, remove to fresh air.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (strong acids and strong bases or alkalis).

Hazardous Decomposition Products: Nitrogen Oxides (NO_x), Carbon Monoxide (CO)

Hazardous Polymerization: Will not occur

Material Safety Data Sheet

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Not required for normal handling.

Respiratory Protection: None normally required.

Protective Clothing: Gloves and work clothing that reduce skin contact are suggested.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State and local regulations. Keep away from heat, flame, ignition sources and strong shock.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

SECTION X - SPECIAL INFORMATION

The reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 may become applicable if the physical state of this product is changed to an aqueous solution. If an aqueous solution of this product is manufactured, processed, or otherwise used, the nitrate compounds category and ammonia listing of the previously referenced regulation should be reviewed.

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Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300

Salt Lake City, Utah 84119

Phone: 801-364-4800 Fax: 801-321-6703

E-Mail: dnna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666**MSDS # 1019****Date 01/24/05**

Supersedes

MSDS # 1019 09/09/04

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): D-GEL™ 1000
DYNOSPLIT®: D1, D3/4, D 7/8
EXTRA GELATIN: 40%, 75%
GELAPRIME® F
UNIGEL®
UNIMAX®
VIBROGEL®: 1,3
Z POWDER™
DYNOMAX PRO™

Oil Well Explosive 80%
Oil Well Explosive 100%
STONECUTTER™
REDH® A
RED H® B
POWERGEL D
60% Hi-Pressure Gelatin
IRESPLIT® D
IP: 724, 738

Product Class: Packaged Dynamites and Blasting Gelatins**Product Appearance & Odor:** Powdery to gelatinous solid, light tan to dark brown color. Faint, waxy odor.**DOT Hazard Shipping Description:** Explosive, blasting, type A 1.1D UN0081 II**NFPA Hazard Classification:** Not Available (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

<u>Ingredients:</u>	<u>CAS#</u>	<u>% (Range)</u>	<u>ACGIH TLV-TWA</u>
Nitroglycerin (NG)	55-63-0	1-20	0.05 ppm
Ethylene Glycol Dinitrate (EGDN)	628-96-6	8-76	0.05 ppm
Nitrocellulose	9004-70-0	0-6	No Value Established
Ammonium Nitrate	6484-52-2	0-75	No Value Established
Sodium Nitrate ¹	7631-99-4	0-50	No Value Established
Sulfur ²	7704-34-9	0-4	No Value Established

¹ Our source of Sodium Nitrate (Chilean) may contain perchlorate ion, which occurs naturally. Although Dyno Nobel does not analyze for the presence of perchlorate anion, based on published studies, the products listed above may contain between 0 and 1,000 ppm perchlorate.

² This ingredient is not found in most of the products listed above.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable**Vapor Density:** Not Applicable**Vapor Pressure:** Not Applicable**Density:** 0.8-1.48 g/cc

Material Safety Data Sheet

Percent Volatile by Volume: Not Applicable

Evaporation Rate (Butyl Acetate = 1): Not Applicable

Solubility in Water: Ammonium and sodium nitrates are completely soluble. NG and EGDN are very slightly soluble.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

Eyes: May cause irritation, redness and tearing.

Skin: Contact may result in headache, nausea and blood vessel dilation.

Ingestion: May result in headache, nausea, intestinal upset and blood vessel dilation.

Inhalation: May result in headache, nausea and blood vessel dilation.

Systemic or Other Effects: *Perchlorate:* Perchlorate can potentially inhibit iodide uptake by the thyroid and result in a decrease in thyroid hormone. The National Academy of Sciences (NAS) has reviewed the toxicity of perchlorate and has concluded that even the most sensitive populations could ingest up to 0.7 microgram perchlorate per kilogram of body weight per day without adversely affecting health. The USEPA must establish a maximum contaminant level (MCL) for perchlorate in drinking water by 2007, and this study by NAS may result in a recommendation of about 20 ppb for the MCL.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Remove contaminated clothing. Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Remove to fresh air. If irritation persists, seek medical attention.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions. May explode when subjected to fire, supersonic shock, or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (mineral acids, bases, strong acids).

Hazardous Decomposition Products: Carbon Monoxide (CO), Hydrogen Sulfide (H₂S), Nitrous Oxides (NO_x), and Sulfur Oxides (SO_x).

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged

Material Safety Data Sheet

and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements. Contact of this product with water may result in a reportable release.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Forced ventilation may be necessary where natural ventilation is limited. Magazines containing NG and/or EGDN based explosives must be ventilated before entry.

Respiratory Protection: None normally required.

Protective Clothing: Chemical resistant (nitrile) gloves are suggested.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: Inhalation and skin contact should be minimized to avoid headaches, nausea, and blood vessel dilation. Protective clothing should be changed daily, more often if contaminated.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State, and local regulations. Keep away from heat, flame, ignition sources, and strong shock.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

SECTION X - SPECIAL INFORMATION

<u>Chemical Name</u>	<u>CAS Number</u>	<u>% By Weight</u>
Nitroglycerin	55-63-0	1-20

The reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 may become applicable if the physical state of this product is changed to an aqueous solution. If an aqueous solution of this product is manufactured, processed, or otherwise used, the nitrate compounds category and ammonia listing of the previously referenced regulation should be reviewed.

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MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION OF PRODUCT

COMPANY: **Diversity Technologies Corp.** DATE: **Apr. 27, 2004**
8750 – 53rd Ave. PHONE: 780-468-4064
Edmonton, AB T6E 5G2 FAX: 780-469-1899

PRODUCT NAME: **POTASSIUM CHLORIDE (POTASH)**

PRODUCT USE: Oil well fluid additive
CHEMICAL FAMILY: Inorganic salt CAS#: 7447-40-7

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: Not WHMIS controlled.
WORKPLACE HAZARD: Treat as nuisance dust.

TRANSPORTATION OF DANGEROUS GOODS (TDG)

PROPER SHIPPING NAME: Not regulated under TDG
TDG CLASSIFICATION: Not applicable
UN NUMBER (PIN): Not applicable
PACKING GROUP: Not applicable

SECTION II: HAZARDOUS INGREDIENTS

<u>INGREDIENT</u>	<u>PERCENT</u>	<u>CAS NUMBER</u>	<u>LD₅₀ Oral-Rat</u>	<u>LC₅₀ Inhal-Rat</u>	<u>ACGIH-TLV</u>
Contains no WHMIS controlled ingredients.					

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: ☐ EYE CONTACT ☐ SKIN ☐ INHALATION ☐ INGESTION
EYE CONTACT: May cause mechanical irritation.
SKIN CONTACT: Prolonged or repeated contact may cause dry skin.
INGESTION: Negligible risk. LD₅₀ (oral-rat) = 2340 mg/kg.
INHALATION: High dust levels may cause upper respiratory tract irritation.
CARCINOGENICITY: No information available.
TERATOGENICITY: No information available.
REPRODUCTIVE TOXICITY: No information available.
MUTAGENICITY: No information available.

SYNERGISTIC
PRODUCTS: No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Flush with water. Dry area thoroughly and apply skin cream or moisturizing cream. If irritation persists, obtain medical attention.

EYE CONTACT: Flush with gently flowing warm water for 15 minutes while holding eyelids open. If irritation persists, obtain medical attention.

INGESTION: Do not induce vomiting. If conscious, rinse out mouth and give 1 to 2 glasses of water to drink. If vomiting occurs keep head below hips to prevent aspiration of vomitus and readminister water. Obtain medical attention. Never give anything by mouth to an unconscious or convulsing victim.

INHALATION: Move to fresh air. Apply oxygen or artificial respiration if required. If breathing difficulties, or distress, continue obtain medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	White crystals; odourless	
SPECIFIC GRAVITY:	2.0	
BOILING POINT (°C):	1500 (sublimes)	
MELTING POINT (°C):	773	
SOLUBILITY IN WATER:	342 g/L @ 20°C	pH: 8-9 (5% sol'n)
PERCENT VOLATILE BY VOLUME:	0	
EVAPORATION RATE:	Not applicable	
VAPOUR PRESSURE (mmHg):	~0	
VAPOUR DENSITY (air = 1):	2.57	
BULK DENSITY:	Not available	

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not flammable
FLAMMABLE LIMITS:	Not applicable
EXTINGUISHING MEDIA:	Use media suitable for surrounding materials and packaging.
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained breathing apparatus required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	None known.

SECTION VII: REACTIVITY DATA

STABILITY:	STABLE [XX]	UNSTABLE []
INCOMPATIBILITY (CONDITIONS TO AVOID):	Incompatible with lithium and bromine trifluorides, strong acids and strong oxidizers.	
CONDITIONS OF REACTIVITY:	Contact with incompatible materials.	
HAZARDOUS DECOMPOSITION PRODUCTS:	Hydrogen chloride and fumes of Na ₂ O.	
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR [XX]	MAY OCCUR []

SECTION VIII: PREVENTATIVE MEASURES**SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION:	Use NIOSH approved dust mask if TLV is exceeded. 8 hour OEL Nuisance Dust Total Mass = 10mg/m ³ .
VENTILATION:	Suggest local exhaust ventilation, if TLV's are exceeded.
PROTECTIVE GLOVES:	Suggest plastic or rubber.
EYE PROTECTION:	Safety glasses.
OTHER PROTECTIVE EQUIPMENT (Specify):	Ensure eyewash station and emergency shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in a cool, dry well-ventilated place away from incompatibles. Keep bags or fibre drums dry at all times. Wash thoroughly after handling. Do not get in eyes, on skin, or on clothing.

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Collect by sweeping and scoop up or shovel. Collect uncontaminated material for repackaging. Collect contaminated material in an approved container for disposal. Keep out of sewers, storm drains, surface waters and soils.

WASTE DISPOSAL METHOD

Dispose in accordance with federal, provincial and local regulations. **This product may be suitable for disposal in landfills; check with local operator.** It is the responsibility of the end-user to determine if material meets the criteria of hazardous waste at the time of disposal. Dispose of all packaging in accordance with local regulations.

SECTION IX: PREPARATION

THE INFORMATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH,
BUT NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DATE ISSUED: April 27, 2004

BY: Product safety committee

SUPERSEDES: June 6, 2002

PHONE: 780-440-4923

**Diversity Technologies Corp. is the parent company of
Canamara-United Supply, Hollimex Products, The Drilling Depot
and Westcoast Drilling Supplies.**

Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300
Salt Lake City, Utah 84119
Phone: 801-364-4800 Fax: 801-321-6703
E-Mail: dnna.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666

MSDS # 1124
Date 01/24/05

Supersedes
MSDS # 1124 10/20/04

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): NONEL[®] LEAD LINE

Product Class: Shock Tube

Product Appearance & Odor: Hollow plastic tubing (normally yellow) with dusty inner coating of HMX and aluminum. No detectable odor.

DOT Hazard Shipping Description: Articles, explosive, n.o.s. (HMX) 1.4S UN0349 II.
For 10,000 ft spools with Wire Lock Terminations only, Not regulated as an explosive, 0000

NFPA Hazard Classification: Not Applicable (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	<u>Occupational Exposure Limits</u>	
			OSHA PEL-TWA	ACGIH TLV-TWA
Cyclotetramethylene Tetranitramine (HMX)	2691-41-0	0.35	None ¹	None ²
Aluminum (dust)	7429-90-5	0.04	15 mg/m ³ (total) 5 mg/m ³ (respirable)	10 mg/m ³

¹ Use limit for particulates not otherwise regulated (PNOR): Total dust, 15 mg/m³; respirable fraction, 5 mg/m³.

² Use limit for particulates not otherwise classified (PNOC): Inhalable particulate, 10 mg/m³; respirable part., 3 mg/m³.

Note: The above hazardous dust mixture is present at approximately 15 mg per meter of tubing.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable

Vapor Density: Not Applicable

Melting Point: HMX decomposes violently at melting pt., about 278°C

Evaporation Rate (Butyl Acetate = 1): Not Applicable

Vapor Pressure: Not Applicable

Density: Not Applicable

Solubility in Water: Not Soluble

Percent Volatile by Volume: Not Applicable

Material Safety Data Sheet

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: Water, inert powder, CO₂

Special Fire Fighting Procedures: For shock tube only, consider initial isolation of at least 15 meters (50 feet) in all directions. Fight fire with normal precautions and methods used for plastic fires from a reasonable distance. IF DETONATORS OR OTHER EXPLOSIVES ARE PRESENT, DO NOT FIGHT FIRE.

Unusual Fire and Explosion Hazards: May burn vigorously with localized detonations and projection of fragments, with effects usually confined to the immediate vicinity of packages. Toxic smoke from combustion of the plastic material may be emitted. If product functions, high heat and pressure are released from the end of the tube if not covered or enclosed, typically by a metal device.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

This is a packaged product that will not result in exposure to hazardous ingredients (inner coating materials) under normal conditions of use.

Eyes: Not a likely route of exposure. Dust particles may be irritating.

Skin: Not a likely route of exposure. Dust particles may cause skin irritation.

Ingestion: Not a likely route of exposure. Ingestion of large amounts of the reactive powder (HMX) is poisonous and may cause cardiovascular collapse.

Inhalation: Not a likely route of exposure. Breathing dust can cause respiratory irritation. During manufacture and at processing temperatures, irritating fumes may evolve.

Systemic or Other Effects: None known.

Carcinogenicity: No constituents are listed by NTP, IARC or OSHA.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Wash with soap and water.

Ingestion: Not Applicable

Inhalation: Not Applicable

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Keep away from heat, flame, impact, friction, ignition sources and strong shocks. Also avoid stretching to failure.

Materials to Avoid (Incompatibility): Incompatible with strong oxidizers and acids.

Hazardous Decomposition or Combustion Products: Hazardous carbon monoxide (CO), nitrogen oxide (NO_x) gases and products of plastic decomposition produced.

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 50 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, repackage undamaged devices in original packaging, accounting for every device. If the ends or tube wall have been opened such that powder may have

Material Safety Data Sheet

been released from the tube, isolate the spill area. Contamination of the HMX/Aluminum powder with sand, grit or dirt will render the material more sensitive to detonation. Carefully wet down and clean "loose" powder spills using a damp sponge or rag, avoid applying friction or pressure to the explosive, and place in a (Velostat) electrically conductive bag. Follow applicable Federal, State, and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: None normally required. Provide enhanced ventilation if used in underground mines, indoors or other enclosed areas.

Respiratory Protection: None normally required. Extended testing of the product indoors or in enclosed areas may necessitate respiratory protection.

Protective Clothing: None normally required. Wear chemical-resistant gloves during post-detonation cleanup or spill cleanup operations.

Eye Protection: Safety glasses or goggles are recommended for handling, testing or cleanup.

Other Precautions Required: None

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State, and local regulations. Keep away from heat, flame, ignition sources and strong shock. Only properly qualified and authorized personnel should handle and use Shock Tube.

Precautions to be taken during use: Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death. Avoid breathing the fumes or gases from detonation of explosives. Detonation in confined or unventilated areas may result in exposure to hazardous fumes or oxygen deficiency.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

SECTION X - SPECIAL INFORMATION

This product contains the following substances that are 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.

<u>Chemical Name</u>	<u>CAS Number</u>	<u>% By Weight</u>
None		

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MATERIAL SAFETY DATA SHEET
Revision Date: 06/04/2003

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: Tellus® Oil T 32
MSDS NUMBER: 60532E - 9
PRODUCT CODE(S): 65401

MANUFACTURER ADDRESS: SOPUS Products, P.O. Box 4453, Houston, TX. 77210-4453

TELEPHONE NUMBERS
Spill Information: (877) 242-7400
Health Information: (877) 504-9351
MSDS Assistance Number: (877) 276-7285

SECTION 2 PRODUCT/INGREDIENTS

CAS#	CONCENTRATION	INGREDIENTS
		Hydraulic Oil
Mixture	85 - 94.99 %weight	Highly refined petroleum oils
Proprietary	3 - 8.99 %weight	Proprietary additives (contains <1% zinc)

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Appearance & Odor: Pale liquid. Mild odor.
Health Hazards: No known immediate health hazards. High-pressure injection under the skin may cause serious damage.
Physical Hazards: No known physical hazards.
NFPA Rating (Health, Fire, Reactivity): 0, 1, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3
Extreme - 4

Inhalation:
Inhalation of vapors (generated at high temperatures only) or oil mist may

cause mild irritation of the nose, throat, and respiratory tract.

Eye Irritation:

Lubricating oils are generally considered no more than minimally irritating to the eyes.

Skin Contact:

May cause slight irritation of the skin. If irritation occurs, a temporary burning sensation and minor redness and/or swelling may result. Release of the material during high-pressure applications may result in injection under the skin causing possible extensive tissue damage which is difficult to heal.

Other adverse effects not expected from brief skin contact.

Ingestion:

Lubricating oils are generally no more than slightly toxic if swallowed.

Other Health Effects:

Material may release hydrogen sulfide (H₂S), a highly toxic and extremely flammable gas, when heated to 180 Degrees F or higher. H₂S can cause irritation of the eyes and respiratory tract, headache, dizziness, nausea, vomiting, diarrhea, and pulmonary edema. The odor ("rotten egg") threshold is 0.02 ppm. Do not depend on sense of smell for warning; H₂S rapidly deadens the sense of smell.

Signs and Symptoms:

Irritation as noted above. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection.

Aggravated Medical Conditions:

Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:

If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin:

Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If material is injected under the skin, transport to the nearest medical facility for additional

treatment. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye:

Flush with water. If irritation occurs, get medical attention.

Ingestion:

Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Note to Physician:

In general, emesis induction is unnecessary in high viscosity, low volatility products such as oils and greases.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: >350 °F/>176.67 °C [Cleveland Open Cup]

Extinguishing Media:

Material will float and can be re-ignited on surface of water. Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water.

Fire Fighting Instructions:

Material will not burn unless preheated. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure, NIOSH approved, self-contained breathing apparatus.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:

May burn although not readily ignitable.

Wear appropriate personal protective equipment when cleaning up spills.
Refer

to Section 8.

Spill Management:

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

Place in container for proper disposal.

Reporting:

CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air, land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water

Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:

Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking.

Material may release hydrogen sulfide (H₂S), a highly toxic and extremely flammable gas, when heated to 180 Degrees F or higher. H₂S may collect in the headspace of the container.

Storage:

Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Container Warnings:

Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or

perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Oil mist, mineral ACGIH TLV TWA: 5 mg/m3 STEL: 10 mg/m3
Oil mist, mineral OSHA PEL TWA: 5 mg/m3
Hydrogen sulfide ACGIH - TLV TWA: 10 ppm STEL: 15 ppm
Hydrogen sulfide OSHA - PEL IS TWA: 10 ppm STEL: 15 ppm
Hydrogen sulfide Elevated Temperatures > 180 F.

EXPOSURE CONTROLS

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

PERSONAL PROTECTION

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation.

Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:

Chemical Goggles, or Safety glasses with side shields

Skin Protection:

Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:
Neoprene, or Nitrile Rubber

Respiratory Protection:

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:

For Mist: Air Purifying, R or P style NIOSH approved respirator.

For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator. Self-contained breathing apparatus for use in

environments with unknown concentrations or emergency situations.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Pale liquid. Mild odor.
Substance Chemical Family: Lubricants
Appearance: Pale liquid.

Flash Point: > 350 °F [Cleveland Open Cup]

Odor: Mild odor.

Pour Point: -20 °F - -40 °F

Specific Gravity: 0.86 - 0.87

Viscosity: > 20 cSt @ 40 °C

SECTION 10 REACTIVITY AND STABILITY

Stability:
Material is stable under normal conditions.

Conditions to Avoid:
Avoid heat and open flames.

Materials to Avoid:
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products:
Thermal decomposition products are highly dependent on combustion conditions.
A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Aldehydes, Carbon Monoxide, Carbon Dioxide, Hydrogen Sulfide, Ketones and other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Dermal LD50 >5.0 g/kg(Rabbit) OSHA: Non-Toxic Based on components(s)

Oral LD50 >5.0 g/kg(Rat) OSHA: Non-Toxic Based on components(s)

Carcinogenicity Classification

Hydraulic Oil

NTP: No IARC: Not Reviewed ACGIH: No OSHA: No

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:

There is no ecological data available for this product. However, this product

is an oil. It is persistent and does not readily biodegrade. However, it does not bioaccumulate.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

Under RCRA, it is the responsibility of the user of the material to determine,

at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification

This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

International Air Transport Association

Not regulated under IATA rules.

International Maritime Organization Classification

Not regulated under International Maritime Organization rules.

SECTION 15 REGULATORY INFORMATION

FEDERAL REGULATORY STATUS

OSHA Classification:

Product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200, because it carries the occupational exposure limit for mineral oil mist.

Ozone Depleting Substances (40 CFR 82 Clean Air Act):

This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:

There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):

Immediate Health:NO Delayed Health:NO Fire:NO Pressure:NO
Reactivity:NO

SARA Toxic Release Inventory (TRI) (313):

There are no components in this product on the SARA 313 list.

Toxic Substances Control Act (TSCA) Status:

All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

Other Chemical Inventories:

Component(s) of this material is (are) listed on the Australian AICS, Canadian DSL, European EINECS,

State Regulation

This material is not regulated by California Prop 65, New Jersey Right-to-Know

Chemical List or Pennsylvania Right-To-Know Chemical List. However for details on your regulation requirements you should contact the appropriate agency in your state.

SECTION 16 OTHER INFORMATION

Revision#: 9
Revision Date: 06/04/2003
Revisions since last change (discussion): This Material Safety Data Sheet (MSDS) has been newly reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-1998). We encourage you to take the opportunity to read the MSDS and review the information contained therein.

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

PRODUCT CODE(S): 65401

Tellus® Oil T 32

ATTENTION!

PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS.
HIGH-PRESSURE INJECTION UNDER SKIN MAY CAUSE SERIOUS DAMAGE.

Precautionary Measures:

Avoid prolonged or repeated contact with eyes, skin and clothing. Avoid breathing of vapors, fumes, or mist. Use only with adequate ventilation. Wash thoroughly after handling.

FIRST AID

Inhalation: If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.
Skin Contact: Remove contaminated clothing and shoes and wipe excess from

skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned. If material is injected under the skin, transport to the nearest medical facility for additional treatment. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment. Eye Contact: Flush with water. If irritation occurs, get medical attention. Ingestion: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth.

FIRE

In case of fire, Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water. Material will float and can be re-ignited on surface of water.

SPILL OR LEAK

Dike and contain spill.

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

CONTAINS: Highly refined petroleum oils, Mixture; Proprietary additives (contains <1% zinc), Proprietary

NFPA Rating (Health, Fire, Reactivity): 0, 1, 0

TRANSPORTATION

US Department of Transportation Classification

This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

Name and Address

SOPUS Products
P.O. Box 4453
Houston, TX 77210-4453

ADMINISTRATIVE INFORMATION

MANUFACTURER ADDRESS: SOPUS Products, P.O. Box 4453, Houston, TX.
77210-4453

Company Product Stewardship & Regulatory Compliance Contact: Timothy W
Childs

Phone Number: (281) 874-7708

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE
TO

US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT : IT IS
PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD
COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE
INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH
RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN.
YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE
OR

DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH
SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH
RESPECT

TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE
APPROPRIATE

GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE
RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE
UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT
DATA,

IS THE PROPERTY OF SOPUS PRODUCTS AND IS NOT TO BE THE SUBJECT OF SALE OR
EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF SOPUS PRODUCTS.

38420-11460-100R-06/03/2003

MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION OF PRODUCT

COMPANY: **Diversity Technologies Corp.** DATE: Jan. 18, 2006
8750 – 53rd Ave. PHONE: 604-940-6050
Edmonton, AB T6E 5G2 FAX: 604-940-6080

PRODUCT NAME: **W-OB POLYMER**

PRODUCT USE: Drilling mud additive
CHEMICAL FAMILY: Polysaccharide suspension CAS #: Mixture

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: D2B
WORKPLACE HAZARD: Skin and eye irritant

TRANSPORTATION OF DANGEROUS GOODS (TDG)

PROPER SHIPPING NAME: Not regulated
TDG CLASSIFICATION: Not applicable
UN NUMBER (PIN): Not applicable
PACKING GROUP: Not applicable

SECTION II: HAZARDOUS INGREDIENTS

<u>INGREDIENT</u>	<u>% (v/v)</u>	<u>CAS NUMBER</u>	<u>LD₅₀ Oral-Rat</u>	<u>LC₅₀ Inhal-Rat</u>	<u>ACGIH-TLV</u>
Ethoxylated nonylphenol	1-5	9016-45-9	5100 mg/kg	Not determined	Not available

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: [XX] EYE CONTACT [XX] SKIN [XX] INHALATION [XX] INGESTION

EYE CONTACT: Irritant. Can cause redness, tearing and inflammation.

SKIN CONTACT: Irritant. Can cause redness, irritation and inflammation.

INGESTION: Low oral toxicity. May cause nausea, abdominal cramps and diarrhea.

INHALATION: High concentrations of vapour and mist can cause irritation of the nose and throat

CARCINOGENICITY: No information available.

TERATOGENICITY: No information available.

REPRODUCTIVE TOXICITY:	No information available.
MUTAGENICITY:	No information available.
SYNERGISTIC PRODUCTS:	No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT:	Remove contaminated clothing. Flush affected area with water and soap for 5 minutes. If irritation persists, contact a physician.
EYE CONTACT:	Immediately flush with gently flowing warm water for 15, or until irritation ceases. When flushing period is completed, obtain medical attention.
INGESTION:	Rinse mouth and give 2 - 3 glasses of water to dilute. Do not induce vomiting. If vomiting occurs keep head below hips to prevent aspiration. Even small amounts of liquid drawn into the lungs from swallowing, or vomiting may cause severe health effects. Obtain medical attention. Never give anything by mouth if patient is unconscious, rapidly losing consciousness or convulsing.
INHALATION:	Move patient to fresh air. Apply oxygen or artificial respiration if required. If breathing difficulties or distress continues obtain medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Opaque yellow to beige liquid; little odour	
SPECIFIC GRAVITY:	1.078	
BOILING POINT (°C):	Not determined	
MELTING POINT (°C):	Not determined	
SOLUBILITY IN WATER:	Dispersible	pH: Not determined
PERCENT VOLATILE BY VOLUME:	Not determined	
EVAPORATION RATE:	Not determined	
VAPOUR PRESSURE (mmHg):	Not determined	
VAPOUR DENSITY (air = 1):	Not determined	
BULK DENSITY:	Not applicable	

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not flammable
FLAMMABLE LIMITS:	Not determined
EXTINGUISHING MEDIA:	CO ₂ , water, mist, foam

SPECIAL FIRE FIGHTING
PROCEDURES:
UNUSUAL FIRE AND
EXPLOSION HAZARDS:

Self-contained breathing apparatus required for fire
fighting personnel.
None known.

SECTION VII: REACTIVITY DATA

STABILITY:	STABLE [XX]	UNSTABLE []
INCOMPATIBILITY (CONDITIONS TO AVOID):	Strong oxidizers and acids.	
CONDITIONS OF REACTIVITY:	Not applicable.	
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxides of carbon on combustion.	
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR [XX]	MAY OCCUR []

SECTION VIII: PREVENTATIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	An approved respirator with organic vapour cartridge if TLV is exceeded.
VENTILATION:	Use local exhaust ventilation, process enclosure or other engineering control to prevent exposure.
PROTECTIVE GLOVES:	Rubber or viton gloves recommended.
EYE PROTECTION:	Chemical goggles and/or face shield required. Do not wear contact lenses.
OTHER PROTECTIVE EQUIPMENT (Specify):	It is recommended that chemical resistant protective clothing be worn at all times when handling this product. Make eye bath and emergency shower available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid ingestion. Practice reasonable caution and personal cleanliness. Avoid skin and eye contact. Avoid inhalation of vapours or mists. Wear suitable protection for eyes and skin when handling. Launder contaminated clothing before reuse. Avoid contact with incompatible materials. Store in cool, well-ventilated area away from sources of ignition. Keep container tightly closed when not in use. Store unused material in original container. Handle and store empty containers as if full.

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Use appropriate safety equipment including respiratory protection. Eliminate ignition sources. Ventilate area. Stop leak if possible to do so without risk. Soak up small spills with absorbent material. Contain large spills using absorbent materials. Collect spilled material and absorbents in approved containers for disposal. Prevent entry into bodies of water or sewer systems.

WASTE DISPOSAL METHOD

Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine at the time of disposal whether the product meets criteria for hazardous waste. Empty containers, which have not been cleaned and purged, contain residual hazardous material and must be disposed of, or recycled, according to local regulations.

SECTION IX: PREPARATION

THE INFORMATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH,
BUT NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DATE ISSUED:	January 18, 2006	BY:	Product safety committee
SUPERSEDES:	March 31, 2003	PHONE:	780-440-4923

Material Safety Data Sheet

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300
Salt Lake City, Utah 84119
Phone: 801-364-4800 Fax: 801-321-6703
E-Mail: dnn.hse@am.dynonobel.com

FOR 24 HOUR EMERGENCY, CALL **CHEMTREC (USA) 800-424-9300**
CANUTEC (CANADA) 613-996-6666

MSDS # 1030**Date 09/05/07**

Supersedes
MSDS # 1030 03/27/07

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s):

DYNO [®] AP	POWERMITE [®]
DYNO [®] AP PLUS	POWERMITE [®] AP
DYNO [®] AP PLUS LD	POWERMITE [®] Canadian
DYNO [®] E5	POWERMITE [®] LD
DYNO [®] MC	POWERMITE [®] LD PLUS
DYNO [®] MC PLUS	POWERMITE [®] PLUS
DYNO [®] SL	POWERMITE [®] RAISE BOMB [™]
DYNO [®] SL PLUS	POWERMITE [®] SL
DYNO [®] TX	POWERMITE [®] SL PLUS
DYNO [®] XTRA	
DYNOSPLIT [®] AP	

Product Class: Emulsion Explosives, Packaged

Product Appearance & Odor: White or pink opaque semi-solid, which will appear gray if product contains aluminum.
Little or no odor. Typically paper or plastic chub packaging.

DOT Hazard Shipping Description: Explosive, Blasting, Type E 1.1D UN0241 II

NFPA Hazard Classification: Not Available (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

<u>Ingredients:</u>	<u>CAS#</u>	<u>% (Range)</u>	<u>Occupational Exposure Limits</u>	
			<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>
Ammonium Nitrate	6484-52-2	60-80	None	None
Sodium Nitrate	7631-99-4	10-18	None	None
Aluminum	7429-90-5	0-15	10 mg/m ³ (dust)	15 mg/m ³ (total)
Mineral Oil	64742-35-4	0-3	5 mg/m ³ (mist)	None

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

Material Safety Data Sheet

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable

Vapor Pressure: Not Applicable

Vapor Density: (Air = 1) Not Applicable

Density: 0.95-1.25 g/cc

Percent Volatile by Volume: <20 (water)

Solubility in Water: Product partially dissolves very slowly in water.

Evaporation Rate (Butyl Acetate = 1): <1

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: >100°C

Flammable Limits: Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

Eyes: May cause irritation, redness and tearing.

Skin: Prolonged contact may cause irritation.

Ingestion: Large amounts may be harmful if swallowed.

Inhalation: Not a likely route of exposure.

Systemic or Other Effects: None known.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists seek medical attention.

Skin: Remove contaminated clothing. Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: If irritation occurs, remove to fresh air.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions, may explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantity.

Conditions to Avoid: Keep away from heat, flame, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (strong acids and strong bases or alkalis).

Hazardous Decomposition Products: Nitrogen Oxides (NO_x), Carbon Monoxide (CO)

Hazardous Polymerization: Will not occur.

Material Safety Data Sheet

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Not required for normal handling.

Respiratory Protection: None normally required.

Protective Clothing: Gloves and work clothing that reduce skin contact are suggested.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State and local regulations. Keep away from heat, flame, ignition sources and strong shock.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

SECTION X - SPECIAL INFORMATION

The reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 may become applicable if the physical state of this product is changed to an aqueous solution. If an aqueous solution of this product is manufactured, processed, or otherwise used, the nitrate compounds category and ammonia listing of the previously referenced regulation should be reviewed.

Disclaimer

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