Q'MAX SOLUTIONS INCORPORATED
SHEET HARBOUR GRINDING PLANT
ENVIRONMENTAL REGISTRATION DOCUMENT

Submitted to:

Nova Scotia Department of Environment and Labour

Submitted by:

Q'Max Solutions Incorporated

Prepared by:

MGI Limited
Dartmouth, N.S

March 2004

QMAX SOLUTIONS INC.

#1700, 407 – 2nd Street S.W., Calgary, Alberta T2P 2Y3
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This Registration document is prepared to comply with the Environment Act, Chapter 1, Acts of 1994-95. A review of the information indicates that there are no significant adverse environmental or socio-economic effects, which may be caused by the undertaking, or that such effects can be mitigated.

QMAX Solutions Inc. requests that the Minister of Environment approve the Undertaking, subject to specified terms and conditions and the other approvals required by statute or regulations.

QMAX Solutions Inc.

Per: Tony Davis

Tony Davis
Managing Director

Dated: February 16, 2004

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March 2, 2004

Nova Scotia Department of Environment and Labour
P.O. Box 2107
Halifax, Nova Scotia
B3J 3B7

MGI File: 20854A

Attention: Mr. Peter I. Geddes
Environmental Assessment Coordinator

Re: Environmental Registration Document – Q'Max Solutions Incorporated, Sheet Harbour Grinding Plant, Sheet Harbour, Nova Scotia

Dear Mr. Geddes:

This Registration document is prepared and submitted by MGI Limited, on behalf of our client, Q'Max Solutions Incorporated, to comply with the Environment Act, Chapter 1, Acts of 1994-95. A review of the information indicates that there are no significant adverse environmental or socio-economic effects, which may be caused by the undertaking, or that such effects can be mitigated.

We trust that this information is sufficient for your reference at this time. However, if you have questions, please contact the undersigned at your convenience.

Sincerely,
MGI LIMITED

Peter G. Oram, CESA, P.Geo.
Vice President

Allan Lines, B.Sc.
Project Geologist

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1.0 INTRODUCTION AND REGISTRATION

1.1 Introduction

Q'Max Solutions Incorporated (Q'Max) proposes to operate a portable grinding plant on a site located in the Sheet Harbour Industrial Park (SHIP). The primary function of this plant would be to grind imported Lump Barite (2 inch minus) to a finished grain size of minus 150 mesh to supply the growing drilling fluids market of the offshore oil and gas industry in Eastern Canada. The grinding plant may also be operated to grind limestone and dolomite to take advantage of any potential excess production capacity of the grinding plant. Limestone and dolomite would be ground to supply the local market for agricultural grade limestone and dolomite. Raw limestone and dolomite would be sourced from local suppliers.

The capacity of the grinding plant is approximately 8 to 10 tonnes per hour, or approximately 17,000 to 21,000 tonnes per year, dependant on the material being ground.

It is planned to import lump barite by sea from overseas sources and have this material landed at the Port of Sheet Harbour in shipments of approximately 10,000 to 15,000 tonnes, one to two times per year. Upon unloading from the ship, the lump barite would immediately be trucked from the wharf front approximately 250 metres to Q'Max's site where it would be stockpiled until being processed through the grinding plant.

Production of powdered barite could range from 10,000 tonnes per year to 21,000 tonnes per year (the maximum annual capacity of the grinding plant), based on market demand.

The finished barite product would then be shipped by road in fully enclosed pneumatic tank trailers to market – initially shipping to St. John's, Newfoundland. Shipping to the Port of Halifax may eventually be undertaken, if supply contracts are obtained. Shipping to either centre would entail between four and fourteen 30 tonne truckloads per week, based upon market demand.

Grinding of limestone and/or dolomite would only be undertaken in the event that excess grinding capacity exists. It is anticipated that grinding of between 2,000 and 5,000 tonnes per year of limestone and/or dolomite may be undertaken at the grinding plant.

If limestone and/or dolomite were to be processed at the site it would arrive by road, trucked from a local supplier (actual supplier yet to be determined). The limestone and/or dolomite would be stockpiled at the site until processed through the grinding plant and then shipped by pneumatic trailer to market.

Operations at the site are expected to employ a maximum of three people: one front-end loader operator, one grinding plant operator and one shipper. Normal hours of operation will be from 8:00 am to 5:00 pm, from Monday to Friday. It is anticipated that operations would continue year-round – no seasonal shut-downs are expected. Winter conditions or normal weather events are not expected to adversely effect operations at the site.

The project setting is favorable for the development of this project. No unmanageable environmental impacts are anticipated for this undertaking. Environmental monitoring aspects of the proposed operation which have been outlined in this document will identify any impacts and allow mitigation plans to be developed.

The Sheet Harbour site has been selected based upon existing facilities and activities at the port – the port already handles and stockpiles bulk minerals including barite and gypsum. The availability of a suitable rental lot within relatively short distance of the wharf front is also a substantial benefit to the project. The industrial setting of the SHIP is separated from residential areas by a minimum distance of 800 metres, a substantial distance which should serve to aid in mitigation of noise from operations on the site. Another benefit of the Sheet Harbour location is its proximity to Halifax (110 km to the west) and a relatively short route (85 km) to connect with the Trans Canada Highway at Exit 24 at New Glasgow, resulting in a significantly shortened road journey to the Newfoundland ferry terminal in Sydney. Alternative locations for this project were studied but none matched the favourable conditions presented by the Sheet Harbour site.

1.2 Registration

Name of Undertaking:	Sheet Harbour Grinding Plant
Location of Undertaking:	Common User Area, Sheet Harbour Industrial Park, Sheet Harbour, Halifax Regional Municipality, Nova Scotia
Proponent:	Q'Max Solutions Incorporated
Chief Executive Officer:	Mr. Reginald Northcott
Head Office:	#1700, 407 – 2nd Street S.W. Calgary, Alberta T2P 2Y3
Telephone Number: Fax Number:	403-269-2242 403-269-2251
Local Office:	1959 Upper Water Street Purdy's Tower 1, Suite 407 Halifax, Nova Scotia B3J 3N2
Telephone Number: Fax Number:	902-425-3850 902-422-2388
Contact Persons for Purposes of Environmental Registration:	Allan Lines MGI Limited 31 Gloster Court Dartmouth, Nova Scotia B3B 1X9 Telephone: 902-468-1248 Fax: 902-468-2207

This environmental registration document has been submitted to partially fulfill the requirements of the Environment Act, S.N.S, 1994-95. The proponent feels that the Minister should give environmental assessment (EA) approval to the project and, where necessary, provide terms and conditions of release (COR).

The proponent is aware that an Industrial Approval from the Nova Scotia Department of the Environment and Labour (NSDEL) is necessary for operation of the grinding plant to commence. The proponent will submit additional information at the Industrial Approval stage using the COR for the application.

The proponent is seeking environmental assessment approval for the grinding of barite, limestone and/or dolomite at the location of their leased site in the Common User Area of the Sheet Harbour Industrial Park. The shipping, loading, unloading and stockpiling of bulk raw materials, including barite and other minerals, at the site are activities which are subject to approvals currently held by the operators of the Sheet Harbour Industrial Park, as is the operation and maintenance of a Stormwater Management Plan (SMP) and related infrastructure.

The proposed undertaking is entirely privately funded – no loans, grants or other public financial support have been sought or obtained for the proposed undertaking by the proponent.

2.0 PROJECT DESCRIPTION

2.1 Project Location

The project is located at Sheet Harbour (Figure 1), approximately 110 kilometers east of Halifax. The site is accessed by vehicles from Highway #7 via a paved all-season road. The proponent has entered into a rental agreement (copy attached in Appendix A) for land within the Common User Area of the port facility of the Sheet Harbour Industrial Park (Figure 2). The Sheet Harbour Industrial Park currently hosts seven industrial tenants, several of which are engaged in handling of bulk materials (wood chips, barite, gypsum) either imported or exported through the port facility.

2.2 Site Description

The grinding plant site is comprised of a 0.36 hectare block of land situated in the southwest corner of the Common User Area of the port facility of the SHIP. The Common User Area of the port facility is 5 hectares or about 9.6% of the total area of the Sheet Harbour Industrial Park which is

approximately 52 hectares. The dimensions of Q'Max's rental lot are approximately 60 metres wide by 60 metres long or an area of 0.36 ha (~0.69% of the total SHIP site).

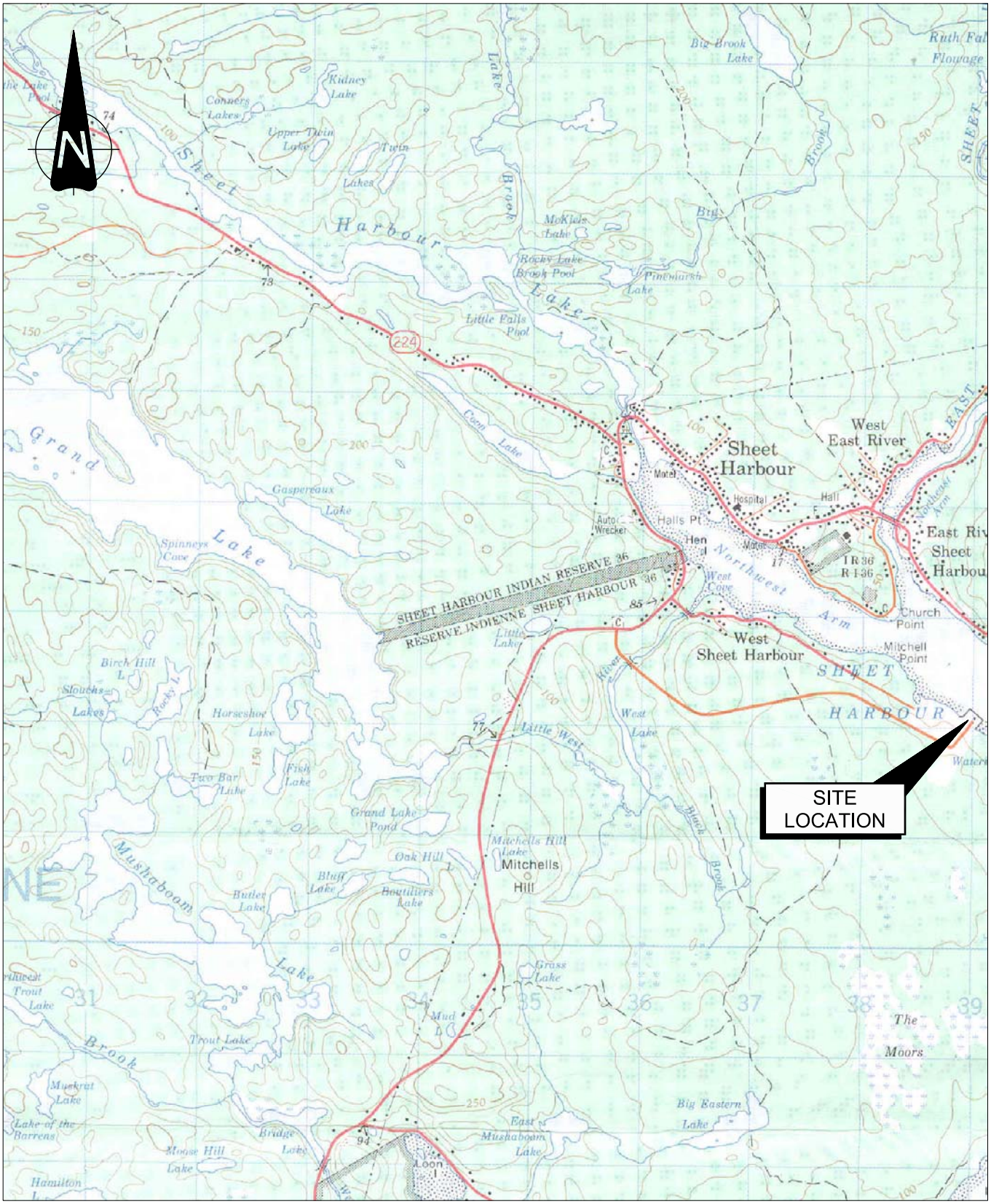
The Common User Area was planned as a lay-down and stockpiling area to serve operations at the port, designed for the stockpiling of bulk materials and access by heavy mobile machinery and trucks. The site is serviced by stormwater management infrastructure, including catch basins, culverts and ditches, which has been proven effective - the site has served for stockpiling of bulk minerals since operations commenced at the port, with no reported incidents of suspended solids entering Sheet Harbour from stockpiled minerals at the site.

The site is a clear, level, gravel-surfaced lot (Figure 3) located within 250 meters of the wharf. The lot was cleared, leveled, infilled with construction aggregates and compacted during construction of the wharf facilities at the SHIP.

The site is accessed from Highway #7 by Industrial Park Road and McInnis Drive - both are paved all season roads. Vehicles arriving at the site will only be required to traverse approximately 100 metres of the gravel lot, at low speeds, substantially reducing dust emissions due to vehicular traffic.

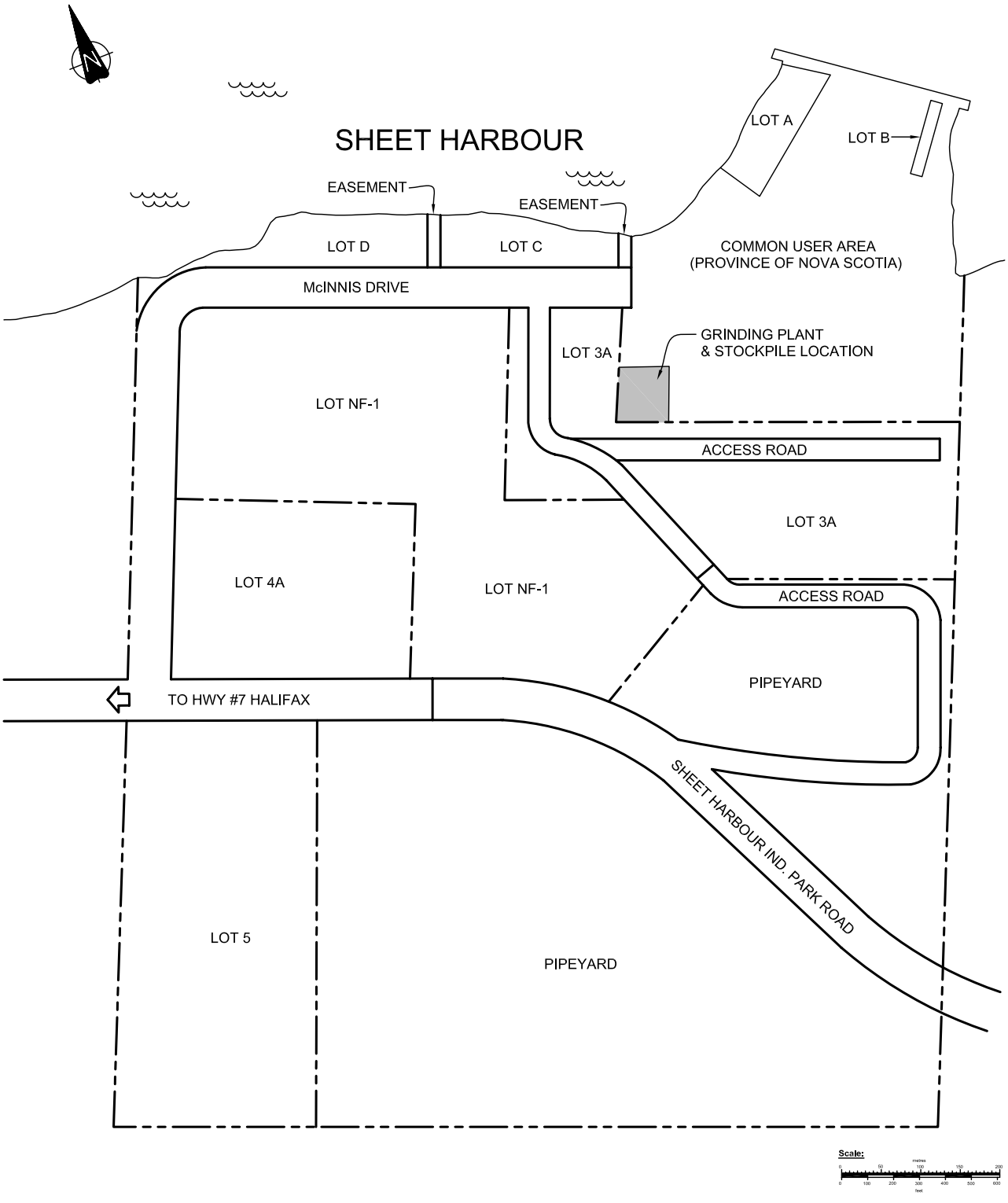
There is currently no on-site water supply or septic system. During operations at the site, potable water for domestic purposes will be supplied using bottled water and sanitary facilities will be supplied by having a portable washroom delivered to the site and serviced by a licensed contractor on a regular basis. No groundwater withdrawals will be required for operations at the site.

All operations – stockpiling, grinding and shipping – will take place on Q'Max's lot. The area used for stockpiling the lump barite will account for approximately 50% (~0.18 ha) of the total surface area (0.36 ha) of the rental lot. The remainder of the gravel lot will be occupied by the grinding plant and ancillary equipment.



MGI A member of the Family of Companies	TITLE **Site Location**	DATE Jan. 2004	PROJECT NO. 20854A
	PROJECT **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**	SCALE 1:50000	FIGURE NO. *1*
		DRAWN CTP	

CADFILE No. 20854AF1.DWG



CADFILE No. 20854AF2.DWG

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TITLE: **Site Diagram - Port Facility**		DATE: Jan. 2004	PROJECT NO.: 20854A
PROJECT: **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**		SCALE: 1:7500	FIGURE NO.: 2
		DRAWN: JLD	

CADFILE No. 20854AF3.DWG

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TITLE: **Sheet Harbour Industrial Park** **Provincial Air Photo 92314-1992**		DATE: Feb. 2004	PROJECT NO.: 20854A
PROJECT: **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**		SCALE: 1:10000	FIGURE NO.: 3
		DRAWN: JDA	

Land use adjacent Q'Max's lot is currently limited to port operations north of the site and a wood chip operation to the west of the site. The lot to the south of the site is currently without an industrial tenant. The land surrounding the SHIP is heavily wooded to the east, west and south. The north side of the SHIP is bounded by Sheet Harbour, an extension of the Atlantic Ocean.

2.3 Equipment Description

The grinding plant and ancillary equipment was designed and built to be portable. The equipment is compartmentalized on three 13 metre long tractor-trailers with additional components loaded and hauled on separate trailers to sites. One trailer contains the generator, generator fuel tank, motor control room and plant control room. The grinding plant, furnace, system fan and furnace oil tank are on another trailer. A third trailer contains the dust collection system and baghouse. The grinding plant and ancillary equipment (Figure 4) require a footprint area of approximately 50 by 40 metres, leaving an area of approximately 0.2 hectares for stockpiling raw material.

The grinding plant is a 60 inch (~1.83 meter) Raymond roller grinding plant, capable of feeding 5 to 10 cm stone and grinding to a minus 150 mesh powder (approximately 0.104 mm) in a single grinding stage, with a throughput of 8 to 10 tonnes per hour.

It is a dry process, with no water added. The grinding plant is operated at elevated temperatures to ensure a dry product - a furnace-oil fired forced air heating system is employed to deliver hot air to the plant to flash-dry the product as it is ground. Material Safety Data Sheets for fuels and lubricants that are to be used on site are attached in Appendix C. The heating system is supplied by a 3915 litre fuel oil tank, located on the grinding plant trailer. This tank was custom built in 1991 by Shaw Resources, welded by a certified pressure welder and pressure tested.

A system fan is employed to create negative air pressure within the grinding plant to prevent the escape of dust. The negative air pressure created within the grinding chamber serves to draw exterior air into the grinding plant, creating air flow into the grinding chamber, thus preventing air borne particles from escaping to the environment. Air borne particles become entrained in the grinding

plant's output to the cyclone, from where air borne particles either settle to the bottom of the cyclone and are then conveyed to a storage silo or are drawn into the dust collection system and baghouse.

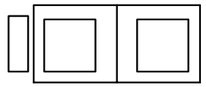
The grinding plant consists of several components: a feed hopper and feed conveyor, a vibratory feeder, roller plant, whizzer classifier, system fan, furnace (flash-dryer), cyclone collector, dust collector bag-house, screw conveyors, air compressor, storage silos for ground barite and a generator. The plant also includes two storage silos of approximately 150 tonnes and 180 tonnes, capacity, sufficient to contain approximately 4 to 5 days production of ground barite. If limestone or dolomite are to be ground at the site, the silos will be cleaned before a different product is introduced to the silo to prevent cross-contamination of the different products.

The grinding plant and all ancillary equipment are operated by electrical motors, powered by a 700kW/600V diesel generator which has a diesel fuel tank of 3625 litres capacity housed in the same trailer. Material Safety Data Sheets for fuels and lubricants that are to be used on site are attached in Appendix C. This tank was custom built in 1991 by Shaw Resources. It was constructed of 6.36 mm (¼") plate steel by a certified pressure welder and then pressure tested.

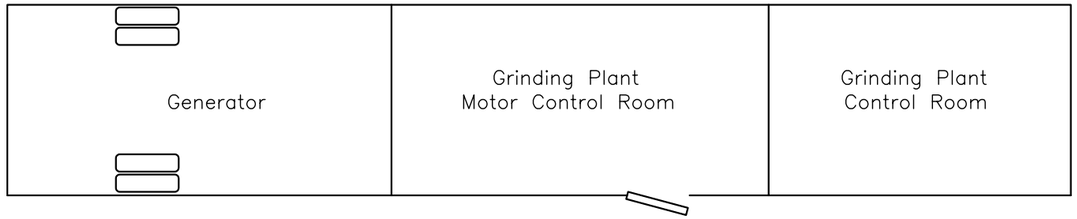
The dust collection system and baghouse are housed in an enclosure built within an enclosed trailer. This double enclosed baghouse system has been constructed to reduce, if not eliminate, the potential for fugitive dust to escape the dust collection system.

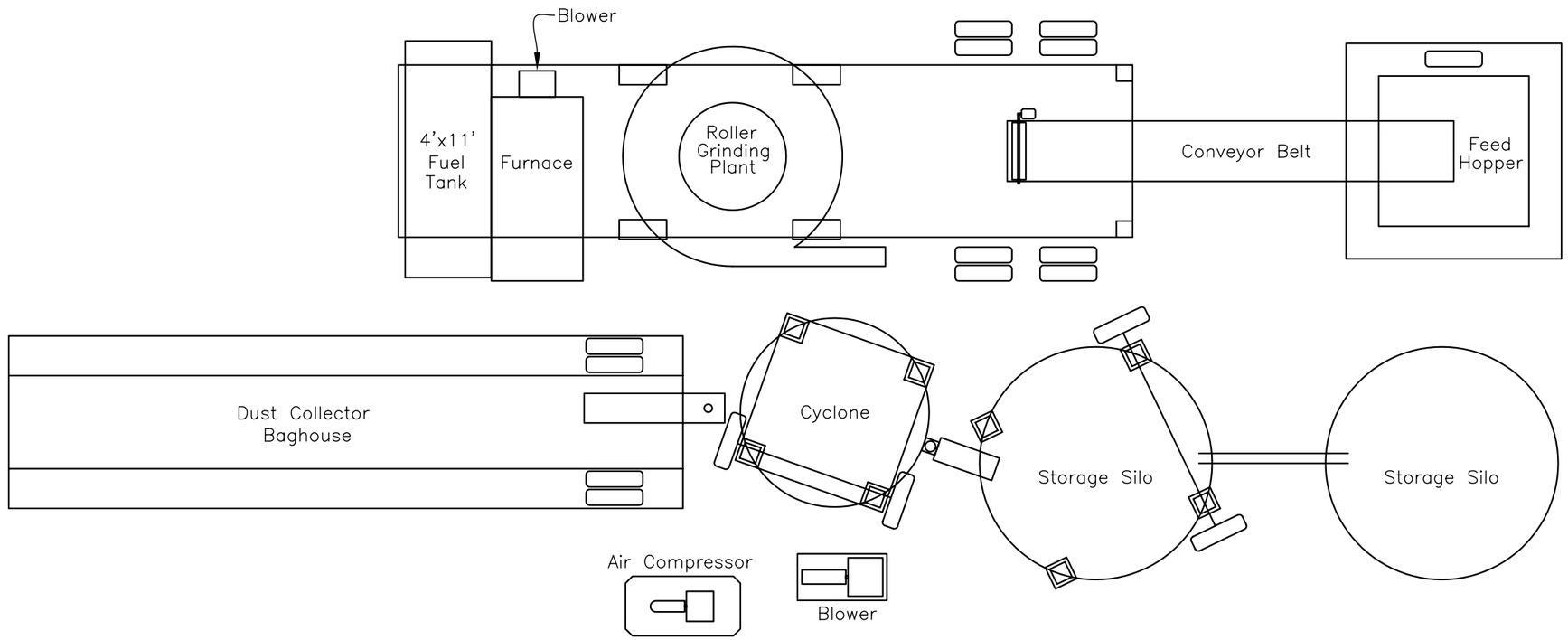
2.4 Operations Overview

Q'Max Solutions Incorporated is company incorporated in Alberta and registered for business under the laws of Nova Scotia (copy of Registry of Joint Stocks information attached in Appendix B). Q'Max Solutions Inc. is Canada's largest independent drilling fluid service company and is privately owned. Q'Max operates in Nova Scotia with a corporate office at Suite 407, 1959 Upper Water Street, Halifax, N.S. Q'Max's proposed operation would entail the importation, processing and marketing of barite to supply the offshore oil and gas exploration industry (Figure 5) and possibly grinding locally sourced limestone and dolomite for the local agricultural market if excess grinding plant production capacity is found to exist.



Step up Transformer
400V Service
600V Lead





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TITLE: **Grinding Plant Layout**		DATE: Jan. 2004	PROJECT NO.: 20854A
PROJECT: **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**		SCALE: NTS	FIGURE NO.: 4
		DRAWN: CTP	

Q'Max Solutions Incorporated's Proposed Barite Grinding Operations

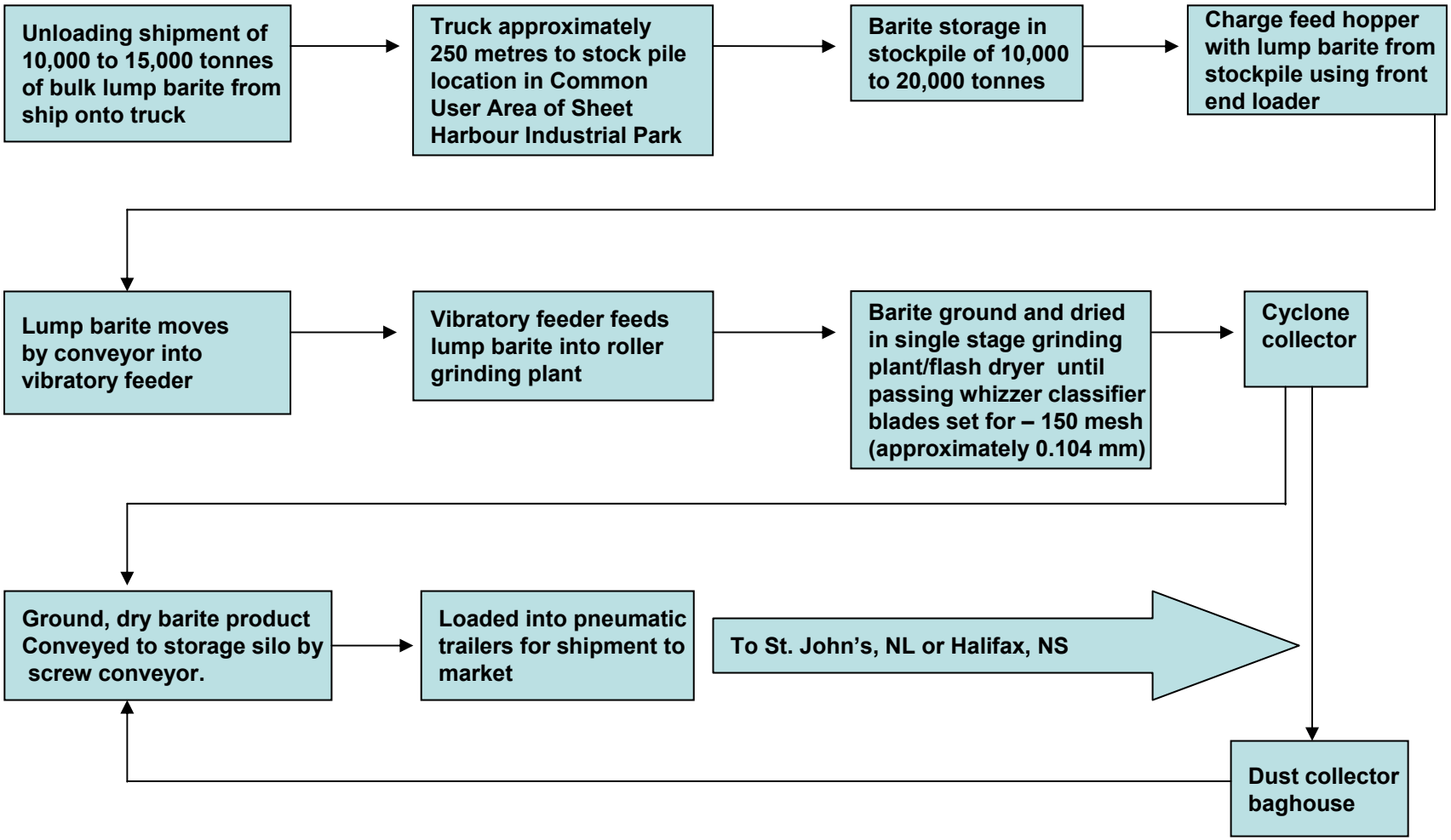


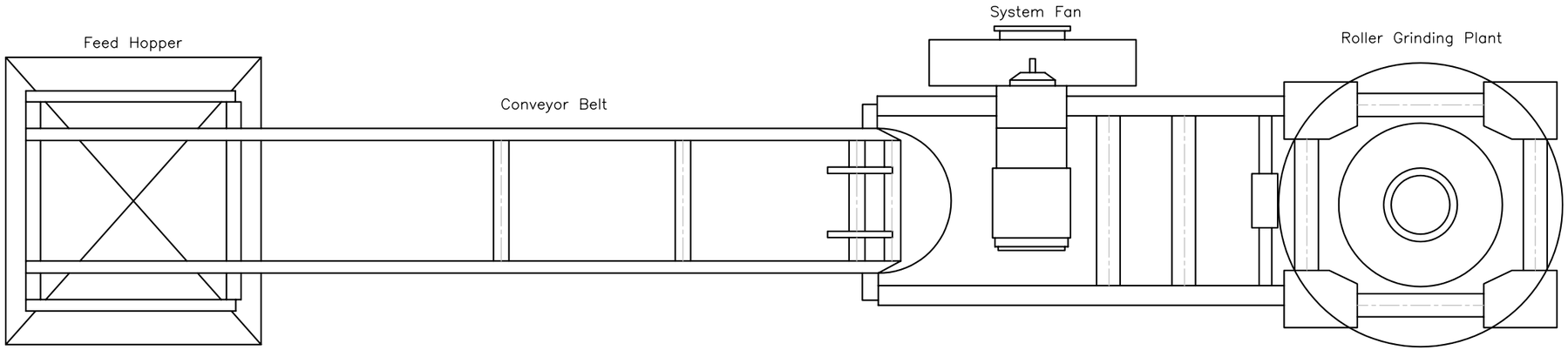
Figure 5

It is planned to import lump barite by sea and have this material landed at the Port of Sheet Harbour in shipments of 10,000 to 15,000 tonnes, one or two times per year. Processing of the barite would then be undertaken at Q'Max's grinding plant located in the Sheet Harbour Industrial Park and shipped by road to markets - initially in St. John's, Newfoundland and eventually, Halifax, Nova Scotia if supply contracts can be obtained.

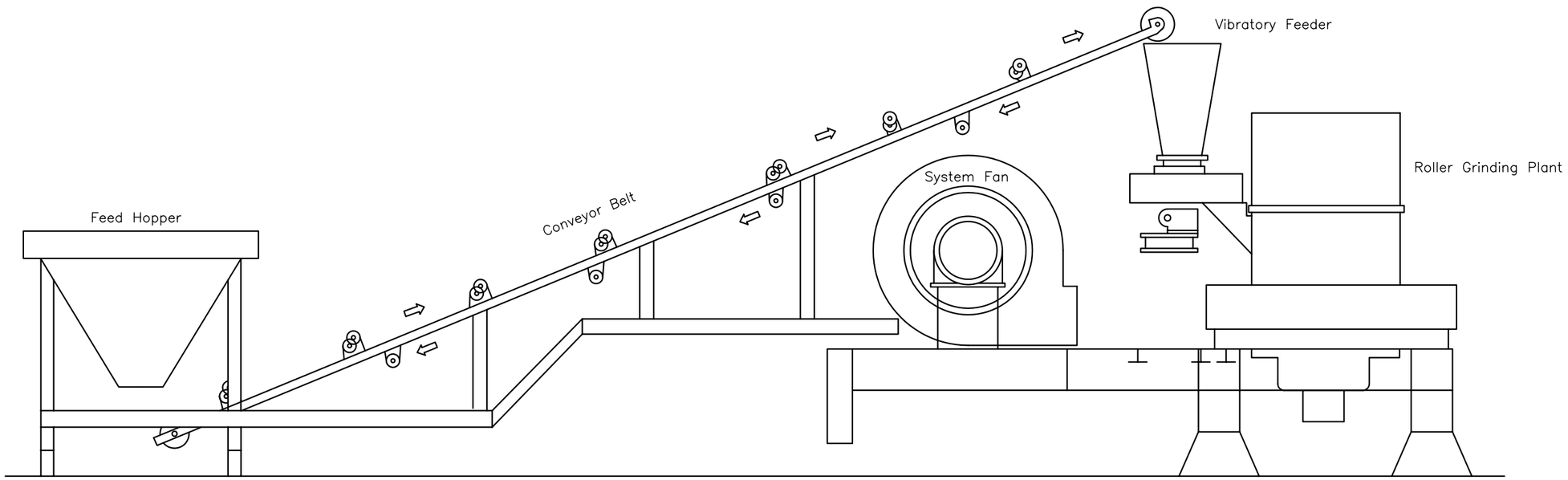
The lump barite would be fed into the feed hopper by means of a front end loader and, from the feed hopper, would travel by conveyor belt to then drop into a vibratory feeder (Figure 6). The material would then be fed into the grinding chamber of the roller plant where it would then be ground by the action of the roller plant until passing through a set of whizzer classifying blades (set to reject particles greater than 150 mesh) and piped into a cyclone collector used to capture the output and allow the powder to settle into the bottom of the cyclone (Figure 7). From the cyclone the product would be transferred by screw conveyor to an enclosed bucket elevator attached to the side of one of the two storage silos. The ground barite would be elevated and dumped into the storage silo. When the first silo is full, the ground barite would then be diverted to the second silo, transferred through piping using compressed air to drive the powdered barite through piping into the second silo.

The ground barite would be stored in silos until loaded into a fully enclosed pneumatic tank trailer for shipment to market. The cyclone would also pipe airborne dust particles into a bag house for dust collection. Particulates that were collected in the bag house would eventually be fed into a silo for storage and shipment to market.

If grinding of limestone and/or dolomite were to be undertaken at the site, the baghouse would be cleaned of barite product before processing of limestone or dolomite were to begin. The barite product from the baghouse would be transferred to the storage silo for sale. A similar process would occur each time before switching from grinding one mineral to grinding another to prevent cross contamination of the different products.



PLAN VIEW



ELEVATION VIEW

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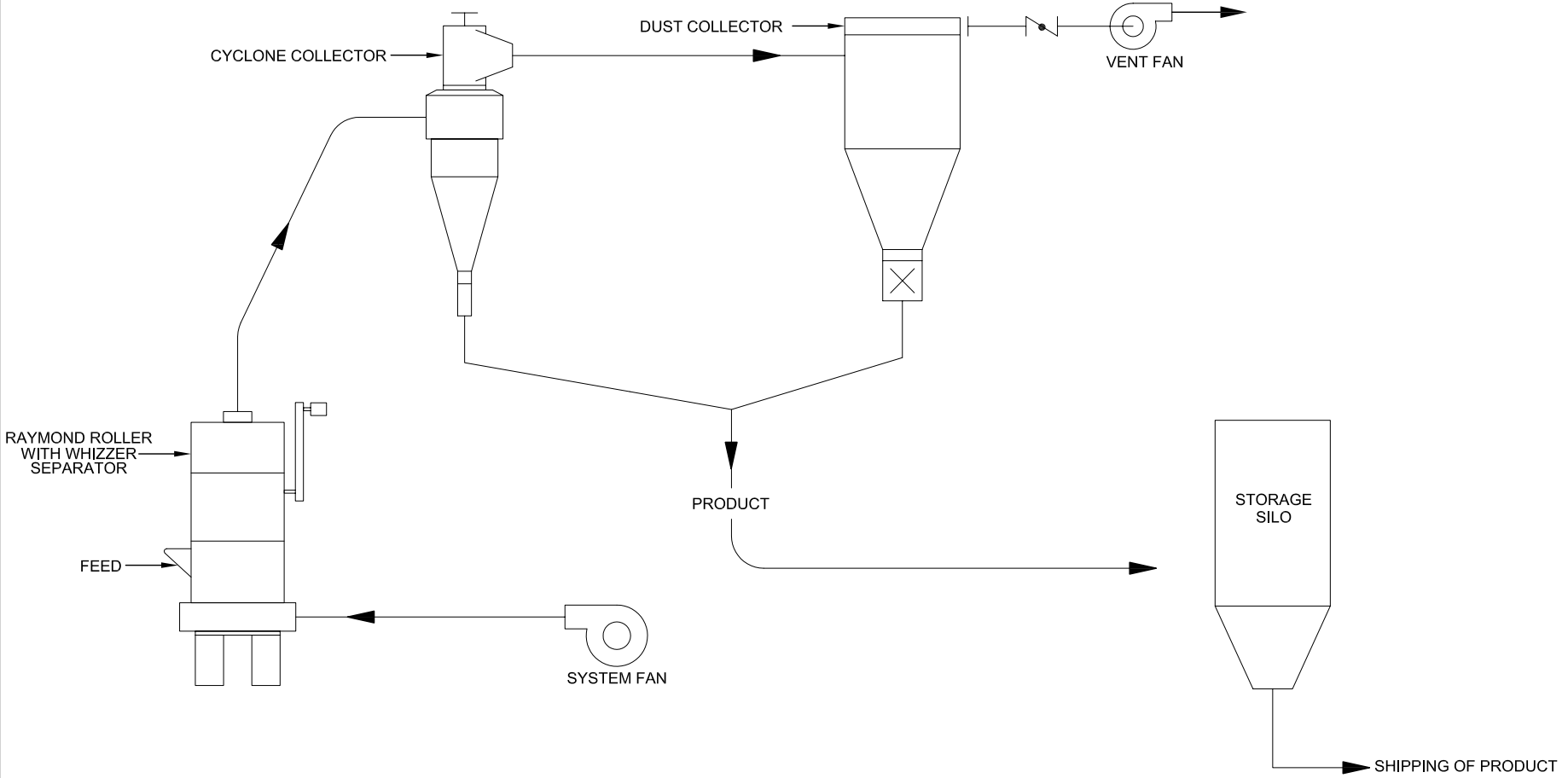
TITLE: **Plant Feed Circuit**		DATE: Jan. 2004	PROJECT NO.: 20854A
PROJECT: **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**		SCALE: NTS	FIGURE NO.: 6
		DRAWN: CTP	



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TITLE
Typical Roller Grinding Operations

PROJECT
Grinding Plant
Q'MAX Solutions Inc.
Sheet Harbour, Nova Scotia

DATE	PROJECT NO.
Jan. 2004	20854A
SCALE	FIGURE NO.
NTS	7
DRAWN	
CTP	

Operations on the site would be undertaken on a one shift per day/five day per week (2080 hours/year) basis during normal operations though this may need to be increased (to a maximum of 3120 hours/year) according to market conditions. Normal hours of operation will be 8:00 am to 5:00 pm, from Monday to Friday. Operations at the site are expected to employ a maximum of three people: one front-end loader operator, one grinding plant operator and one shipper.

The finished barite product would be shipped by road in fully enclosed pneumatic tank trailers to market – initially shipping to St. John's, Newfoundland. Shipping to the Port of Halifax may eventually be undertaken, if supply contracts are obtained. Shipping the finished barite product would entail between four and fourteen 30 tonne truckloads per week, based upon market demand.

Upon delivery to St. John's, the material would be transferred from the pneumatic trailers to bulk silos at the dockside in St. John's harbour or at a warehouse facility in Mount Pearl. If contracts are obtained to provide products to end users in Nova Scotia, the ground barite would be delivered via pneumatic trailer to an approved site on the Halifax or Dartmouth waterfront. The ground barite would then be transferred from the pneumatic trailer using compressed air to pipe the material into bulk silos at dockside. Transportation of the barite powder to an offshore well site is then completed by transferring the product from the bulk silos to a pneumatic storage hold on an offshore supply vessel which delivers the ground barite in powder form to an offshore drilling platform. It should be noted that all required approvals for the storage and handling of ground barite are in place for several sites on the Halifax and Dartmouth waterfronts.

To ensure efficient handling of the ground barite, the material is kept enclosed and dry – no water is introduced during the grinding process and no liquid effluents are produced. The barite powder is flash dried during the grinding process by the elevated temperatures under which the grinding plant is operated. From the point at which the raw material enters the grinding chamber the entire process is fully enclosed, including shipping and delivery to the end user.

Fuelling of equipment will be performed by mobile fuel trucks. A minimal amount of lubricants will be stored on site to meet equipment maintenance requirements. Storage will be in a secure storage box designated for this purpose, located in an on site storage trailer. These lubricants include but are

not limited to: hydraulic oil, gear oil, compressor oil, diesel engine oil and greases. Material Safety Data Sheets for fuels and lubricants that are to be used on site are attached in Appendix C. Used oils, filters and lubricants will be collected by an authorized recycling company. Spill clean-up equipment will be kept on-site and all personnel will have knowledge of its whereabouts and proper use.

Operations will not be adversely effected by most weather events. The equipment is designed to operate under a broad range of environmental conditions and it is believed that only the most extreme weather events, sufficient to threaten life and/or property, would limit operations at the site.

2.5 Product Description

BARITE - Barite ($BaSO_4$) is a naturally occurring non-metallic mineral which most often forms as vein replacements in sedimentary rocks. The dominant use of barite is as a weighting agent in drilling fluids for the oil and gas drilling industry. Barite is ideally suited for this use because it is non-abrasive, dense (4.2 to 4.5 g/cm^3), relatively soft (Moh's hardness of 2.5 to 3.5), relatively non-soluble in water (0.2 mg/litre), clean, chemically inert and less expensive compared to many other heavy materials.

The imported raw material will meet American Petroleum Institute (API) physical and chemical specifications for lump barite (Table 1). Raw barite is tested to determine compliance with these industry standards before it is purchased from the supplier. The density standards limit the potential for the imported lump barite to contain high concentrations of impurities such as clay, quartz or calcite, as high concentrations of these relatively light minerals would compromise the density properties of the barite products.

TABLE 1: API PHYSICAL AND CHEMICAL SPECIFICATIONS FOR BARITE

Requirement	A.P.I. Specification
Density	4.20 gm/cm^3, minimum
Water Soluble Alkaline Earth Metals as Calcium	250 mg/kg, maximum
Residue > 75 micrometers	3.0 wt. %, maximum
Particles < 6 micrometers in equivalent spherical diameter	30.0 wt. %, maximum

Release of potential impurities, such as heavy metals, to the environment will be limited by the highly insoluble nature of barite. As barite does not dissolve under normal atmospheric conditions, release of trace elements from the stockpiled barite will not occur. It is noted, however, that the United States Environmental Protection Agency (US EPA) has established guidelines for mercury and cadmium concentrations (Table 2) in stock barite for use in drilling mud, which are universally applied as an industry standard for barite ores. Raw barite is tested to determine compliance with these guidelines for mercury and cadmium concentrations before it is purchased from the supplier. All of the lump barite that will be imported to the Sheet Harbour site will come from one of two sources – Morocco or China – two deposits which supply the majority of the world's lump barite for drilling mud production, due in large part to ores which are low in mercury and cadmium and comply with the US EPA Guidelines.

TABLE 2: COMPARISON OF MERCURY AND CADMIUM GUIDELINE CRITERIA: U.S. EPA EFFLUENT GUIDELINES VS. CCME SOIL GUIDELINES

Analyte	EPA 40-CFR-435.13 Effluent Guidelines (Oil and Gas Point Source Category) (mg/kg)	CCME Soil Guidelines (Residential) (mg/kg)	CCME Soil Guidelines (Commercial) (mg/kg)	CCME Soil Guidelines (Industrial) (mg/kg)
Mercury (Hg)	1	6.6	24	50
Cadmium (Cd)	3	10	22	22

No separation or fractionation of impurities from the material will be required (imported barite ores will comply with strict industry physical and chemical specifications to ensure the barite products from the operation will be saleable) or will occur at the site, and no solid waste derived from the imported barite will be generated by the proposed undertaking – all raw material will be ground and then shipped from the site, leaving no remnant raw material on site upon completion of operations. After grinding, the barite will be in the form of a fine, dry powder, white to light grey in colour with a density of between 4.2 g/cm^3 and 4.4 g/cm^3. A Material Safety Data Sheet (MSDS) for powdered barite is attached in Appendix D.

LIMESTONE – Limestone, (calcite, $CaC0_3$) is a naturally occurring mono-minerallic rock, which forms from chemical sedimentary (evaporites) or organic-derived (corals or shell detritus) sedimentary rocks. A common use of limestone is in agriculture to condition and enhance the pH of

acidic soils. A Material Safety Data Sheet (MSDS) for powdered limestone is attached in Appendix D.

DOLOMITE – Dolomite, (dolostone, $CaMg(C0_3)_2$) is a naturally occurring mineral or mono-minerallic rock, which forms from chemical sedimentary (evaporites) rocks. Dolomite is used in agriculture to enhance soil pH and as an additive in fertilizer as a source of magnesium (Mg). A Material Safety Data Sheet (MSDS) for powdered dolomite is attached in Appendix D.

2.6 Environmental Considerations

Environmental considerations have been identified with operation of the grinding plant including,

1. The potential for fine-grained particulate material to be released to the environment as dust and/or sediment in air or water, respectively.

2. Potential for metals contamination of soil and/or groundwater.

3. Potential for excessive noise from the operation of heavy machinery (electrical motors and internal combustion engines).

4. Potential for accidental release of hydrocarbons to the environment from site equipment due to refueling operations, vandalism, vehicular impact, tank, product line failure or storage of hydrocarbon based lubricants on site.

Section 6 outlines the monitoring and mitigation which will be implemented as part of the project development and operation. All of the concerns noted above have been considered in the project design and can be mitigated.

2.7 Site Reclamation and Future Land Use

The site is a level, vacant gravel lot which will be restored to this condition upon cessation of the project. As the barite grinding plant is designed to be a portable unit there is no requirement for the construction of a foundation or pad for the machinery. The operation will not require any site preparation and therefore no alteration of the site will be undertaken. At such time as the operation may cease, the equipment would be removed in its entirety leaving the site in much the same condition as before operations commenced. Restoration of the site to its original condition is prescribed in paragraph 5 of the land rental agreement (Attachment 1) between Q'Max and North Atlantic Marine Terminals Limited.

Future land use will likely continue to be as part of the port facility, and entail the handling, stockpiling and shipping of other bulk materials.

2.8 Employment and Other Project Benefits

At full operation the undertaking could provide year-round full time employment for an estimated 3 persons, this number may increase if market demand for the product dictates an increase in production, to an anticipated maximum of 6 persons. The staff for these positions will be drawn from the local Sheet Harbour and Tangier areas and the project will maintain a local hire/local purchase policy where feasible to do so.

Other project benefits will include trucking contracts to deliver the finished barite product to market, increased ship traffic to the Port of Sheet Harbour, which will result in incremental increases in the volume and diversity of economic activity in the Sheet Harbour area.

2.9 Project Schedule

The proponent has immediate need to secure the necessary permits for full operation so as to supply a number of purchasers with finished barite products. The operation would be able to supply product

to markets within several weeks of receiving all necessary permits, as the equipment and raw material are now on-site. The operations would be year-round.

The lifespan of the grinding operation is difficult to predict due to variable demand for weighting agents for drilling fluids in the Atlantic Canada region, however it is expected to be in operation for at least 10 years as offshore oil and gas exploration continues.

Site decommissioning will consist of removal of all equipment from the site. No raw material will remain on site – all raw materials will either be processed on site or removed to another approved facility for processing. The site would be returned to its pre-existing state – that of a gravel surfaced lot. No equipment or infrastructure will be left on site upon completion of the undertaking.

3.0 ENVIRONMENTAL SETTING

3.1 Geography and Geomorphology

The site location has been previously described as well as the regional physiography. This section outlines the local geography particularly the topographic features of the site.

The Common User Area is a flat graveled area, located adjacent Sheet Harbour. Elevation of the site is approximately 7 metres above sea level. Much of the Common User Area was constructed as wharf, extending from the original coastline out into Sheet Harbour.

To the south of the Common User Area an artificial bank has been cut into the slope (presumably to facilitate creation of a level lot in the Common User Area), resulting in a steep rise to Lot 3A. Continuing further south from Lot 3A the topography of the land has been maintained close to original land surface. The grinding plant site is approximately 250 metres from the dock face.

3.2 Surficial Geology

The surficial deposits at the project location within the Sheet Harbour Industrial Park consist of a stony till mapped by the Nova Scotia Department of Natural Resources (NSDNR) to be between 2 and 4 metres thick, covering 90% of the surface area. In some areas thin soils (Danesville soils – sandy loam) have developed from the underlying quartzite. The till unit is described as stony with a sandy matrix and rapid drainage. The site itself is underlain by imported aggregates used in the construction of the graveled lot. Hydraulic conductivity of the substrate at the site is estimated to be relatively high, ranging from 1.0×10^{-2} cm/sec to 1.0×10^{-4} cm/sec.

3.3 Bedrock Geology

The bedrock at the site is mapped by NSDNR as quartzites of the Cambro-Ordivician Goldenville formation (NSDNR Map ME-2000-1, JD Keppie). Immediately north of the site is a geological contact with the Cambro-Ordivician Halifax Formation.

The Goldenville Formation quartzite bedrock at the site would have a low to moderate hydraulic conductivity, ranging from 1.0×10^{-6} to 1.0×10^{-4} cm/sec, depending on fracture density. The bedrock underlying the site is expected to be highly fractured, given its proximity to the fault which formed Sheet Harbour. This sinistral fault has produced a substantial offset of approximately three kilometres, and is expected to have caused extensive brittle deformation in the bedrock at the site. There are no concerns with Acid Rock Drainage (ARD) as the site is underlain by quartzite and the grinding plant will not require excavation of bedrock.

3.4 Surface Water

The surrounding area is of moderate relief with low hills (generally less than 70 meters) and gentle slopes. The longitudinal axis of the hills in the local area trend SE-NW, following geological structure. Surface watercourses also follow a general SE-NW trend, flowing towards the southeast in a dendritic flow pattern. The site is mapped as occurring entirely within watershed 1EM-SD4 which is 2159 hectares in size (Figure 8).

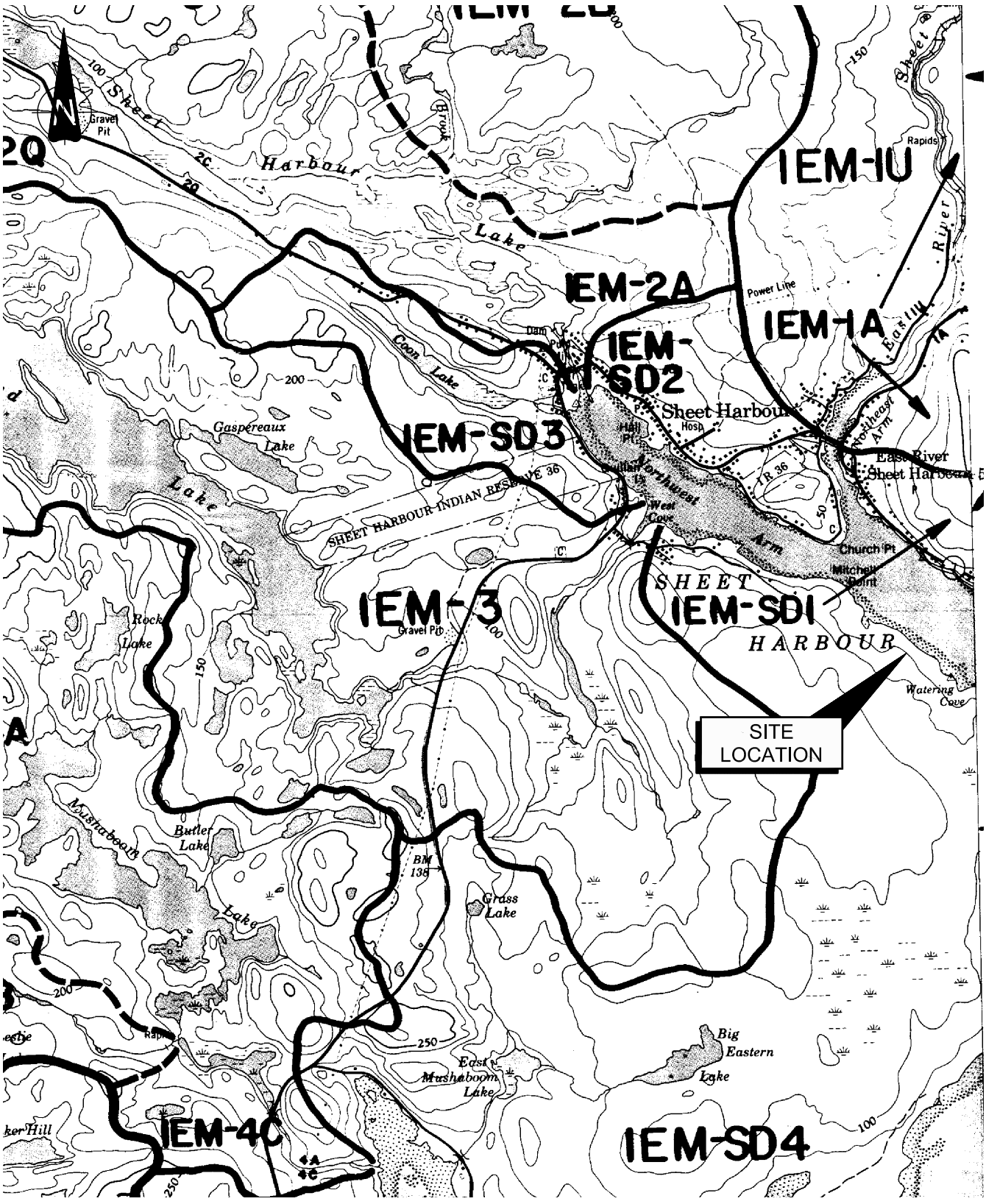
The nearest surface watercourse (freshwater) is an unnamed tributary of Black Brook, which is located approximately 2.2 kilometres southeast and upgradient of the site. Surface water from the site of the barite grinding plant would travel overland toward Sheet Harbour (250 metres northeast of the site) but would be intercepted by site drainage infrastructure and diverted to a settling pond to the east of the Common User Area.

Extensive stormwater management infrastructure was installed during infrastructure upgrades at the Sheet Harbour Industrial Park in 1995 and 1996. This stormwater management infrastructure includes catch basins, ditches, culverts, french drains, berms and settling ponds, all of which act to prevent entry of suspended solids into Sheet Harbour.

During and after precipitation events, overland flow is intercepted by drainage ditches which run along both sides of each street in the industrial park. Water is channeled through these drainage ditches and culverts, and progresses down gradient toward Sheet Harbour. Before reaching the harbour, water is diverted from the ditches and culverts into one of two settling ponds located on the west and east boundaries of the industrial park.

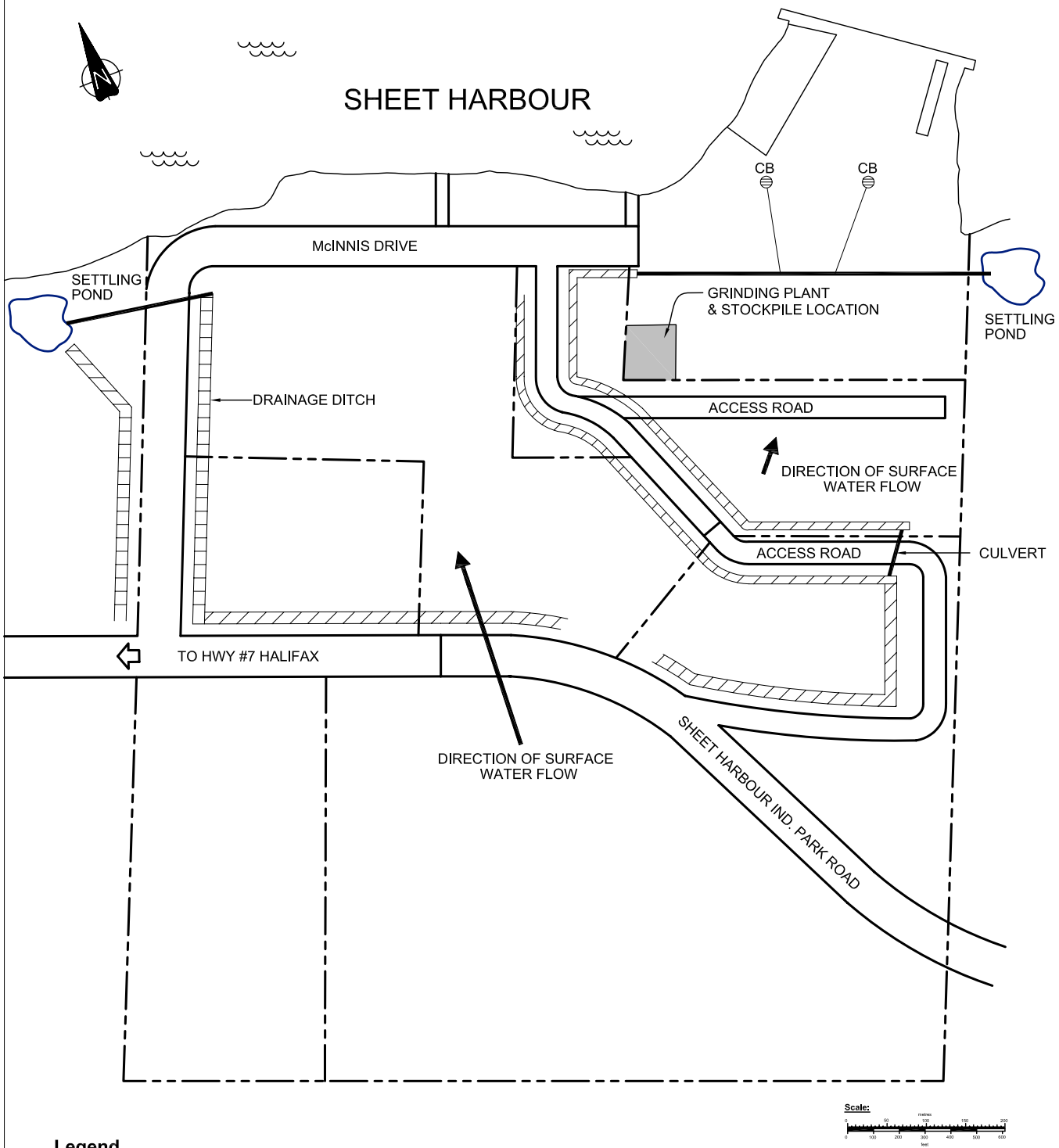
Photos showing installation of stormwater management infrastructure at the site during 1995 and 1996 were obtained from the Nova Scotia Department of Transportation and Public Works (NSTPW) and are attached in Appendix D. SHIP operates the stormwater management system (Figure 9) as part of their operating permit for the site.

The stormwater management infrastructure in the Common User Area has been proven effective - no incidents of suspended solids entering Sheet Harbour from stockpiled minerals at the Common User Area have been reported to the local inspector of NSDEL.



CADFILE No. 20854AF8.DWG

MGI A member of the Family of Companies	TITLE **Site Location**	DATE Jan. 2004	PROJECT NO. 20854A
	PROJECT **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**	SCALE 1:50000	FIGURE NO. *8*
		DRAWN CTP	



CADFILE No. 20854AF9.DWG

A member of the Family of Companies

TITLE: **Stormwater Management System**		DATE: Jan. 2004	PROJECT NO.: 20854A
PROJECT: **Grinding Plant** **Q'MAX Solutions Inc.** **Sheet Harbour, Nova Scotia**		SCALE: 1:7500	FIGURE NO.: 9
		DRAWN: CTP	

3.5 Groundwater

Groundwater use within the Sheet Harbour Industrial Park is limited to five wells used for domestic purposes. Four of these water supplies are located hydraulically up-gradient and over 100 metres from the proposed operations at the site; the fifth well is located on the southeast side of the Common User Area and is approximately 240 metres cross-gradient from the site of proposed operations. Records for three of the five water supply wells in the industrial park are available from the NSDEL well logs database, and are presented in Table 3, below.

TABLE 3: WELL RECORDS FOR WATER SUPPLY WELLS IN THE SHEET HARBOUR INDUSTRIAL PARK

Location	Date Completed	Static Depth (feet)	Depth to First Fracture Zone (feet)	Depth to Second Fracture Zone (feet)	Total Depth (feet)	Diameter (inches)	Yield (gal/min)	Casing Depth (feet)
Lot 3A	June 7, 1989	9	40	90	300	8	4	21
Lot 3A	June 9, 1989	0	40	140	300	8	4	22
Common User Area	Sept 5, 1991	0	80	n/a	260	6	0.7	27

Note: The proposed grinding operations will not require groundwater withdrawals as part of the operation as no water is introduced during the grinding process.

3.6 Habitat

The site is located on the Atlantic Coast/Bay of Islands physiographic region and is typified by ridge and valley topography and abundant vegetation and surface water. The terrestrial habitats within this area are varied with hardwood hills and softwood valleys and aquatic habitats consisting of occasional wetland systems bordering rivers and lakes.

The 52 hectare site of the Sheet Harbour Industrial Park has been cleared of wood and several roadways have been constructed to permit industrial uses. The Sheet Harbour Industrial Park is a marine industrial development with most tenants utilizing the port for import of export of their products or raw materials. There is no wetland habitat or expected terrestrial habitat of significance known at the site.

4.0 PUBLIC CONSULTATION

The proponent has discussed, via an informal public consultation program, the permitting of the operation, with a number of the commercial tenants of the Sheet Harbour Industrial Park, with no recorded strong opposition. Import and export of bulk non-metallic minerals (including barite and gypsum) has been ongoing at the port for a number of years and airborne particulate material has not been reported to have been a significant problem for other tenants of the park during loading/unloading, stockpiling or shipping operations.

Formal public consultation will include notification and the provision of this document to the following so that the public may fully examine the proposed development. The following is a list of public viewing locations for the document. In addition, the document will be posted on the NSDEL website at: http://www.gov.ns.ca/enla/ess/ea/projects.htm

Sheet Harbour Public Library – Blue Water Business Centre, Sheet Harbour, 22756 Highway #7, Sheet Harbour, Contact: Helen Thexton, Branch Manager, 1-902-889-4076

Nova Scotia Department of Natural Resources 12086 #224 Highway, Middle Musquodoboit, Contact: Michael Coady, Area Supervisor, 1-902-384-2290

Nova Scotia Department of Environment and Labour, Central Regional Office, Sunnyside Mall, Bedford

Nova Scotia Department of Environment and Labour, 5th Floor Library, 5151 Terminal Road, Halifax

The Clean Nova Scotia Foundation, 1875 Bedford Row, Halifax

Ecology Action Center, Suite 31, 1588 Argyle Street, Halifax

5.0 RECLAMATION AND CORPORATE ENVIRONMENTAL POLICY

The proposed reclamation plan for the site of the operation have been outlined in Sections 2.6 and 2.7. The key elements of the reclamation plan for each of the areas is presented below for reference:

- minimize disturbance of existing site by using portable equipment which requires no site preparation
- utilize existing stormwater management infrastructure to control any potential run-off from the operation
- maintain equipment to operate as designed to reduce possibility of releases of airborne particulate materials
- removal of all equipment upon completion of operations at the site

The proponent is committed to operating the barite grinding plant so that environmental impacts are minimized. Site conditions are favorable for a development such as this, whereby no disturbance to undeveloped land is necessary and the key environmental issue relates to minimization of entry of suspended solids into surface water bodies, noting that existing controls at the site have proven effective to prevent run-off from stockpiled materials from entering surface water bodies.

6.0 SUMMARY OF IMPACTS, MITIGATION AND MONITORING

Through the compilation of data for the preparation of this document a complete picture of the site and surrounding area was developed. The proposed operation has no known impacts to the natural setting of the area and minimal potential impacts.

Potential environmental impacts include:

1. Fine-grained particulate material to be released to the environment as dust and/or sediment in air or water, respectively.

2. Potential for metals contamination of soil and/or groundwater.

3. Noise from the operation of heavy machinery (electrical motors and internal combustion engines).

4. Potential for accidental release of hydrocarbons to the environment from site equipment due to refueling operations, vandalism, vehicular impact, tank, product line failure or storage of hydrocarbon based lubricants on site.

Mitigative measures of the potential environmental impacts listed above include:

1. The possible release to the environment of fine-grained material as suspended particulate matter in air or suspended solids in water will be mitigated by engineering controls of the equipment and the site.

   From the point at which the raw material enters the grinding chamber until delivery to the end user the process and product is kept fully enclosed. The products from the plant are sent in a closed system to a cyclone where any airborne particles are extracted to a dust collector and a double enclosed baghouse. This is to prevent product losses and also to guard against moisture entering the system – the powdered material must be maintained perfectly dry to facilitate material transfer from the grinding plant to the storage silos and further to the pneumatic trailers used for shipping of the product.

   The grinding plant itself is operated under negative air pressure to guard against release of dust to the environment. While in operation the grinding plant will draw air from the outside into the grinding chamber, the resulting inflow of air will prevent the escape of any fine particles from the grinding chamber.

   The potential for dust from the stockpile of raw material will be mitigated through spraying the surface of the stockpile with water as often as required to prevent the generation of dust from the stockpile. Water for this purpose will be obtained by pumping from the settling pond to the east of the site.

The potential for dust creation by tractor trailers used for shipping the products is limited. The ground products will be shipped in fully enclosed pneumatic tank trailers and will therefore not allow the release dust from the products to the environment. Road dust from traversing gravel roads and parking areas will not be a significant issue – Highway#7, the Sheet Harbour Industrial Park Road and McInnis Drive (the roads used to access the site) are all asphalt paved roads which terminate within 100 metres of Q'Max's site. Tractor trailers will therefore only have to traverse less than 100 metres of graveled lot, and this at low speeds (less than 10 km/hour), to reach the shipping facilities and then return to the paved surface of McInnis Drive (again at low speed).

No liquid effluents are produced in the process and therefore no release of potential suspended particles in water would originate from the grinding plant.

Overland run-off containing fine-particulate matter from stockpiles of raw materials on site may occur, but would be mitigated by capture of suspended particles by turbulent overland flow over a coarse gravel parking lot. If water borne particulate materials did escape capture by the gravel lot, stormwater from the site is handled by the site's stormwater management infrastructure which would divert entrained particles into a settling pond where such particles would be captured before water was discharged to Sheet Harbour.

Before and after commissioning and testing of the plant and equipment it is proposed to obtain air samples to measure suspended particulate materials. This will ensure baseline conditions are known and will quantify what particulate emissions may result from operations at the site. If exceedences of applicable guidelines are recorded during testing after the plant is commisioned, it is proposed to develop further dust mitigation methods and protocols at that time in consultation with officials of NSDEL.

2. Potential metals contamination of soil and/or groundwater will be mitigated by stockpiled materials having a short residence time on site and the relatively dry conditions within the stockpiles. Potential metals contribution from the barite ores will also be limited by the

highly insoluble nature of barite and universal industry standards for API specification barite products.

Raw materials, primarily barite (and potentially limestone and/or dolomite) will be stockpiled only so long as required to process these stockpiles – the residence time of raw materials would be limited to the time required to process them. The limited space available on the rental lot will ensure a short residence time on site.

Any potential leaching of metals from the raw materials will also be extremely limited the non-saturated conditions that will exist in the stockpiles – solubility of any metals in any of the stockpiled raw materials would depend on saturated conditions (water as solvent) within the stockpiles. The aboveground stockpiling of raw materials will not permit saturated conditions to exist within the stockpiles.

In the case of barite ores stockpiled on site for processing – the highly insoluble nature of barite would limit any potential for metals leaching from the stockpiled raw material. Barite is not water soluble and is stable even under exceedingly acidic conditions of pH. Metals concentrations in raw ores shipped to the site will also comply with universal industry standards for mercury and cadmium concentrations.

3. Heavy equipment and other machinery to be used during operations at the site have the potential to generate excessive noise levels which will be limited by the type of equipment used, distance to residential receptors and hours of operation.

   Unloading of shipments of lump barite will utilize equipment at the port facility that is normally in operation during loading or unloading operations at the port and excessive noise levels are not anticipated with unloading operations. Transfer of the lump barite from the wharf front to the stockpile at Q'Max's site will be undertaken using dump trucks contracted for this purpose. Noise levels in excess of those typical of this industrial setting are not anticipated to be associated with transfer operations. Loading of the plant's feed circuit will be accomplished with a front-end loader which is not expected to generate abnormally high

noise levels above those typical of an industrial setting. The grinding plant is powered by a diesel fuelled generator. The generator is contained within a trailer, which will to a large degree attenuate any excessive noise created by the generator itself.

The operations will take place at a distance of over 800 metres from the nearest residence on the east side of Sheet Harbour and over 1200 metres, with intervening forested land, from the nearest residence on Western Shore Road on the west side of Sheet Harbour.

Hours of operation will normally be from 8:00 a.m. to 5:00 p.m., when daytime noise guidelines are 65 dBA for residential receptors. Given the distance to receptors and the enclosure of the generator, noise effects are anticipated to be well within daytime guidelines at the nearest receptor.

Upon commissioning and testing of the plant and equipment it is proposed to measure noise levels resulting from operations at the site and if exceedences of applicable guidelines are recorded, it is proposed to develop further noise mitigation methods and protocols at that time in consultation with officials of NSDEL.

4. Potential for accidental release of hydrocarbons to the environment from site equipment due to refueling operations, vandalism, vehicular impact, tank or product line failure or storage of hydrocarbon based lubricants on site.

Refueling of equipment will be done by mobile tanker trucks by trained personnel. The storage tanks themselves are mounted on trailers and protected from vehicular impacts and vandalism by the trailer frames and the positioning of other equipment around the trailers. The tanks were both constructed in 1991 by certified pressure welders at Shaw Resources and are constructed of 6.35 mm (1/4”) plate steel. Both tanks were pressure tested at the time of manufacture.

A minimal amount of lubricants will be stored on site to meet equipment maintenance requirements. Storage will be in a secure storage box designated for this purpose, located within an on site storage trailer.

Spill clean-up equipment will be kept on-site and all personnel will have knowledge of its whereabouts and proper use, and personnel will contact the emergency telephone number of NSDEL immediately in the event of a fuel spill.

The proponent anticipates Conditions of Environmental Assessment Approval and Industrial Approvals to include monitoring of suspended solids on a monthly basis for the settling pond east of the site. This program will enable the necessity of further mitigation of impacts to be determined should they be outlined through the monitoring.

7.0 CONTINGENCY PLAN

At this time no contingency plan has been developed for the proposed operations at the site. It is noted that a contingency plan is a *requirement* of a Part V Industrial Approval, and a contingency plan will be developed to fulfill the requirements of the proponent's planned application for an Industrial Approval for operations at the site.

8.0 SUMMARY OF BENEFITS

The project has a number of direct benefits for the community of Sheet Harbour and surrounding areas including direct generation of full-time, year-round employment and an incremental diversification of the economic base of the area.

Additional benefits will result from trucking contracts to deliver the product to markets and increased ship and road traffic to the Sheet Harbour area, and the resultant increase in purchases of fuel, meals and other goods and services in the local area.

APPENDIX A

LAND RENTAL AGREEMENT

NORTH ATLANTIC MARINE
TERMINALS LIMITED
568 COLBY DRIVE
DARTMOUTH, NOVA SCOTIA
B2V 1X9
TEL: (902) 435-5619
FAX: (902) 435-0210

February 17, 2004

Q'MAX Solutions Inc.
407-1959 Upper Water Street
Purdy's Wharf, Tower I
Halifax, Nova Scotia
B3J 3N2

Attn: Mr. William Mihalic

Re: Land Rental – Sheet Harbour Marine Terminal

North Atlantic Marine Terminals Limited (NAMTL) agrees to rent a one (1) acre site at the Sheet Harbour Marine Terminal to Q'MAX Solutions Inc (QSI) for the storage and processing of barite, subject to the following:

1. Land – one (1) acre site, as mutually agreed
2. Rent –
   (i) January 1, 2004 through August 31, 2004 - $ 480.00 per month
   (ii) September 1, 2004 through August 31, 2005 - $ 700.00 per month

   Plus applicable taxes
   Invoiced monthly, with payment due 30 days from date of invoice

3. Termination Notice – NAMTL agrees to provide QSI with six (6) months notice, should NAMTL require the site for its own terminal operations/activities. Provided that QSI, acting reasonably, cannot, within the six (6) month notice period, process all barite on site (at the time notice was given), then agreement will be extended on a month to month basis until such time as all barite onsite can be processed with the additional period not to exceed six (6) months.

   Notwithstanding the foregoing, in the event that the barite processing facility creates an unacceptable level of airborne contaminates for other businesses located in the Sheet Harbor Industrial Park, QSI agrees to immediately cease operations until the problem is corrected, or vacate the premises.

4. QSI is responsible for all required services, including water, power, buildings, etc.

5. QSI is to ensure the restoration of the site to its original (as before) condition when vacating premises.

APPENDIX B

REGISTRY OF JOINT STOCKS INFORMATION

Q'MAX Solutions Inc.
February 17, 2004

Please confirm acceptance of the above terms and conditions by signing below and returning original to my attention.

Sincerely yours,

Malcolm Swinemer, Vice President
North Atlantic Marine Terminals Limited

17/Feb/04
(Date)

William Mihalic
QMAX Solutions Inc.

24/FEB/04
(Date)

Nova Scotia

CERTIFICATE OF REGISTRATION

Corporations Registration Act

Registry Number

3002801

Name of Corporation

Q'MAX SOLUTIONS INC.

I hereby certify that the above-mentioned corporation is registered under the provisions of the Corporations Registration Act.

Karen Richard
Deputy Registrar of Joint Stock Companies

October 30, 1996
Date of Registration

NOVA SCOTIA
Service Nova Scotia and Municipal Relations
Registry of Joint Stock Companies

Print | Close Window

PROFILE - Q'MAX SOLUTIONS INC. - as of 2004-02-11 10p.m.

Company/Society Name:	Q'MAX SOLUTIONS INC.
Registry ID:	3002801
Type:	Extra-Provincial Corporation
Nature Of Business:	SUPPLY OF DRILLING FLUIDS
Status:	Active
Jurisdiction:	Alberta
Registered Office:	1601 LOWER WATER STREET HALIFAX NS B3J 2V1
Mailing Address:	PO BOX 730 HALIFAX NS B3J 2V1

PEOPLE

Name	Position	Civic Address	Mailing Address
WILLIAM HANS	Director	80 DALZELL PLACE N.W. CALGARY AB T3A 1H5	
REGINALD A. NORTHCOTT	Director	259 MOUNTAIN PARK DR S.E. CALGARY AB T2Z 2L2	
REGINALD A. NORTHCOTT	PRESIDENT	259 MOUNTAIN PARK DR S.E. CALGARY ALBERTA T2Z2L2	
ROBERT B. HANS	Director	AV. REPUBLICA DE EL SALVADOR 836 Y PORTUQAL EDF. PRISMA NORTE - PISO 6 QUITO S.A.	
ROBERT B.			

HANS	TREASURER		
ANTHONY J. DAVIS	Director	529 SHAWINIGAN DR S.W. CALGARY AB T2Y 3A3	
ED FERCHO	Director	BOX 52 SITE 2 RR 2 OKOTOKS AB T0L 1T0	
ANTHONY DAVIS	SECRETARY	NS	
Jeffrey Blucher	Recognized Agent	1601 LOWER WATER STREET HALIFAX NS B3J 2V1	PO BOX 730 HALIFAX NS B3J 2V1
FRANK STACK	Director	1108 BELLAVISTA CRESCENT S W CALGARY AB T2V 2A8	
MARK A. ROBERTS	CHIEF FINANCIAL OFFICER	NS	

ACTIVITIES

Activity	Date
Incorporated in other Jurisdiction	1993-09-16
Registered	1996-10-30
Appoint an Agent	1997-09-18
Annual Renewal	1997-09-29
Annual Statement Filed	1997-09-30
Annual Statement Filed	1998-10-27
Annual Renewal	1998-10-28
Annual Renewal	1999-10-07
Annual Statement Filed	1999-10-07
Annual Statement Filed	2000-10-19
Annual Renewal	2000-10-20
Annual Renewal	2001-10-23

Annual Statement Filed	2001-10-23
Annual Renewal	2002-09-24
Annual Statement Filed	2002-09-24
Annual Renewal	2003-10-02
Annual Statement Filed	2003-10-02

RELATED REGISTRATIONS

There are no related registrations on file for this company.

APPENDIX C

MSDS SHEETS FOR FUELS AND LUBRICANTS USED ON SITE

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	B-3, D-2B		

Section 1. Chemical Product and Company Identification

Product Name	**DIESEL FUEL**	**Code**	W104, W293 SAP: 120, 121, 122, 287
		Validated on	**2/6/2004.**
Synonym	Diesel 50, Diesel 50 LS, #1 Diesel , #1 Diesel LS, Diesel LC, Seasonal Diesel, Seasonal Diesel LS, Diesel AA, Domestic Marine Diesel, International marine Diesel, Seasonal Diesel Locomotive, Domestic Marine diesel LS, diesel -20°C (LS), LSD, Low Sulphur Diesel, dyed diesel, marked diesel, coloured diesel, Naval Distillate, Ultra Low Sulphur Diesel, ULS Diesel, Mining Diesel, Mining Diesel Special, Mining Diesel Special LS, High Flash Mining Diesel, Furnace Oil, Stove Oil.		
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining Diesel has a higher flash point requirement, for safe use in underground mines.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
1) Diesel oil.	68334-30-5	>99.9	100 mg/m³ (as total hydrocarbons) *	Not established	Not established
2) Proprietary additives. Aromatic content is 50% maximum (benzene: nil). Sulphur content is 0-0.50%.	Not available	<0.1	Not established	Not established	Not established

Manufacturer Recommendation	* Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Combustible liquid. Exercise caution when handling this material. Contact with this product may cause skin and eye irritation. Prolonged or repeated contact may cause skin irritation, defatting, drying and dermatitis. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Class II - combustible liquid (NFPA).	**Flammable Limits**	LOWER: 0.7%, UPPER: 6% (NFPA)
Flash Points	Diesel Fuel: Closed Cup: >40°C (>104°F) Marine Diesel Fuel: Closed Cup: >60°C (>140°F) Mining Diesel: Closed Cup: 52°C (126°F)	**Auto-Ignition Temperature**	225°C (437°F)
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container. Vapour explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), water vapour (H2O), smoke and irritating vapours as products of incomplete combustion. See Section 11 (Other Considerations) for information regarding the toxicity of the combustion products.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a moderate flash point above 40°C: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

Material Release or Spill	Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Extinguish all ignition sources. Stop leak if safe to do so. Ventilate area. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Avoid contact with spilled material. Avoid breathing vapours or mists of material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Evacuate non-essential personnel. Ensure clean-up personnel wear appropriate personal protective equipment. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	COMBUSTIBLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated. Avoid confined spaces and areas with poor ventilation. Ensure all equipment is grounded/bonded. Wear proper personal protective equipment (See Section 8).
Storage	Store away from heat and sources of ignition. Store in dry, cool, well-ventilated area. Store away from incompatible and reactive materials (See section 5 and 10). Ensure the storage containers are grounded/bonded.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.	**Viscosity**	1.3 - 4.1 cSt @ 40°C (104°F)
Colour	Clear to yellow / brown (may be dyed for taxation purposes).	**Pour Point**	Variable, -50°C to 0°C (-58°F to -32°F)
Odour	Petroleum oil like.	**Softening Point**	Not applicable.
Odour Threshold	Not available	**Dropping Point**	Not applicable.
Boiling Point	150 - 371°C (302-700°F)	**Penetration**	Not applicable.
Density	0.80 - 0.85 kg/L @ 15°C (59°F)	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	4.5 (Air = 1)	**Ionicity (in water)**	Not applicable.
Vapour Pressure	Not available	**Dispersion Properties**	Not available
Volatility	Semivolatile to volatile.	**Solubility**	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	**Decomposition Products**	May release COx, NOx, SOx, H2S, H2O, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Acute oral toxicity (LD50): 7500 mg/kg (rat).
Chronic or Other Toxic Effects	
Dermal Route:	This product contains a component (at >= 1%) that can cause skin irritation. Therefore, this product is considered to be a skin irritant. Prolonged or repeated contact may defat and dry skin, and cause dermatitis. (See Other Considerations)
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Eye Irritation/Inflammation:	This product contains a component (at >= 1%) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	ACGIH A3: animal carcinogen. [Diesel oil] (See Other Considerations)
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as Group 1, 2A, or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.

Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer. Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	DIESEL FUEL, 3, UN1202, PGIII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). All components of this formulation are listed on the US EPA-TSCA Inventory. All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. Please contact Product Safety for more information.

DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Irritating substance. CLASS: Target organ effects. CLASS: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	2
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)

Rating: 0 Insignificant; 1 Slight; 2 Moderate; 3 High; 4 Extreme

Section 16. Other Information

References Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials (
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)

DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazardous Communication System
HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS
Internet: www.petro-canada.ca/msds

Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 2/6/2004.

Data entry by Product Safety - JDW.

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	B-3, D-2B		

Section 1. Chemical Product and Company Identification

Product Name	**FUEL OIL**	**Code**	W105 SAP: 132, 156, 286, 300
Synonym	#1 Furnace Oil, Furnace Oil 50, Seasonal Furnace Oil, Seasonal Furnace Oil Special, Economy Diesel, Stove Oil, ThermaClean.	**Validated on**	**2/5/2004.**
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Fuel Oils are distillate fuels suitable for use in liquid fuel burning equipment without preheating.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
1) Mixture of petroleum distillates. Aromatic content is 50% maximum (benzene: nil).	68476-30-2, 64742-81-0	100	100 mg/m³ (as total hydrocarbons) *	Not established	Not established

Manufacturer Recommendation	* Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Combustible liquid. Exercise caution when handling this material. Contact with this product may cause skin and eye irritation. Prolonged or repeated contact may cause skin irritation, defatting, drying and dermatitis. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Class II - combustible liquid (NFPA).	**Flammable Limits**	Lower: 0.7%, Upper: 6%
Flash Points	Open Cup: >40°C (>104°F), Cleveland.	**Auto-Ignition Temperature**	225°C (437°F)
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.	**Explosion Hazards in Presence of Various Substances**	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container. Runoff to sewer may create fire or explosion hazard.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating vapours as products of incomplete combustion.		

Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a moderate flash point above 40°C: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6. Accidental Release Measures

Material Release or Spill	Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Extinguish all ignition sources. Evacuate non-essential personnel. Ventilate area. Stop leak if safe to do so. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. Avoid contact with spilled material. Avoid breathing vapours or mists of material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	COMBUSTIBLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Ensure all equipment is grounded/bonded. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Wear proper personal protective equipment (See Section 8). Avoid confined spaces and areas with poor ventilation. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated.
Storage	Store away from heat and sources of ignition. Store in dry, cool, well-ventilated area. Store away from incompatible and reactive materials (See section 5 and 10). Ensure the storage containers are grounded/bonded.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.	**Viscosity**	1.2 - 4.1 cSt @ 40°C (104°F)
Colour	Clear to yellow / brown (may be dyed for taxation purposes).	**Pour Point**	Not available
Odour	Mild petroleum oil like.	**Softening Point**	Not applicable.
Odour Threshold	Not available	**Dropping Point**	Not applicable.
Boiling Point	150 - 371°C (302 - 700°F)	**Penetration**	Not applicable.
Density	0.80 - 0.88 kg/L @ 15°C (59°F).	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	4.5 (Air = 1)	**Ionicity (in water)**	Not available
Vapour Pressure	1.0 kPa @ 20°C (7.5 mmHg @ 68°F).	**Dispersion Properties**	Not available
Volatility	<0.1 (Butyl acetate = 1), less than gasoline.	**Solubility**	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	**Decomposition Products**	May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Acute toxicity information is not available for the product as a whole, therefore, data for some of the ingredients is provided below: **Fuel Oil No. 2 (68476-30-2):** Acute Oral toxicity (LD50): 12000 mg/kg (rat) **Kerosine (petroleum), hydrosulfurized (64742-81-0):** Acute Oral toxicity (LD50): >5000 mg/kg (rat) Acute Dermal toxicity (LD50): >2000 mg/kg (rabbit) Acute Inhalation toxicity (LC50): >5000 mg/m³/4h (rat)
Chronic or Other Toxic Effects	
Dermal Route:	This product contains a component (at >= 1%) that can cause skin irritation. Therefore, this product is considered to be a skin irritant. Prolonged or repeated contact may defat and dry skin, and cause dermatitis.
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Eye Irritation/Inflammation:	This product contains a component (at >= 1%) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at >= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	ACGIH A3: animal carcinogen. [Diesel fuel] (See Other Considerations)
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	Not available
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	* Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification	FUEL OIL, 3, UN1202, PGIII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

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

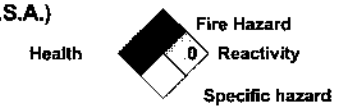
Please contact Product Safety for more information.

DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Irritating substance. CLASS: Target organ effects. CLASS: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.	**DOT (U.S.A) (Pictograms)**	

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	2
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)



Rating
0 Insignificant
1 Slight
2 Moderate
3 High
4 Extreme

Section 16. Other Information

References Available upon request.
* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials (
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
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DSCL - Dangerous Substances Classification and Labeling (Europe)
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EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazardous Communication System
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

HMIS - Hazardous Material Information System
IARC - International Agency for Research on Cancer

For Copy of MSDS
Internet: www.petro-canada.ca/msds

Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 2/5/2004.

Data entry by Product Safety - JDW.

Southwestern Petroleum Corporation • 534 North Main Street • Fort Worth, Texas 76106 USA

Material Safety Data Sheet

Product Trade Name: 103 Moly H I Plus Grease **Revision Date:** 05/09/03

Emergency Phone Number: CHEMTREC 1-800-424-9300

Chemical Family: Petroleum Hydrocarbon Based Lubricant

Section 1: Fire and Explosion Hazards

NFPA Codes – Health: 1 **Fire:** 1 **Reactivity:** 0 **Other:** NAIF

Flash Point, °C: >179 **Method:** C.O.C **Auto Ignition Temp. , °C:** >343

Flammable Limits, %Volume – Lower: 0.9 **Upper. , °C:** 7

Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide.

Special Firefighting Procedures: Use water to keep fire-exposed container cool. Water spray may be used to flush spills away from exposures. Recommend wearing a self-contained breathing apparatus. Thermal decomposition products may include acrolein, bao, carbon monoxide, and other asphyxiants.

Unusual Fire & Explosion Hazards: Water or foam may cause frothing.

Section 2: Physical Data

Boiling Point: NA

Melting Point: NA

Specific Gravity (Water = 1): 0.9

Ph: NA

Water Solubility: No

Vapor Density (Air = 1): >5

Percent Volatile By Volume: None

Primary Volatiles: None

Odor: Lube oil odor

Appearance: Grey/black colored thick semi-solid

Section 3: Reactivity Data

Stability: Stable

Polymerization: Does not occur

Incompatibility: Strong oxidants or alkalies, such as: hydrogen peroxide, nitric acid, perchloric acid, chromium trioxide, and sodium hydroxide.

Conditions To Be Avoided: Heat and ignition sources

Unusual Hazards: NAIF

Section 4: Spill and Disposal Handling

Spill: Use inert absorbant material to confine spills and to absorb material. Scoop into a disposable container. Ventilate spill area if necessary. Wear personal protective equipment.

Disposal: Land fill or incinerate as Federal, state, and local regulations permit.

Section 5: Hazardous Ingredients

Component:	CAS#:	%	Carcinogen
Hydrotreated and solvent Dewaxed residual oils 5mg/cubic meter OSHA pel-8 hours	64742-57-0 64742-62-7	30-40	no
Severely hydrotreated heavy Naphthenic petroleum oils 5mg/cubic meter OSHA pel-8 hours	64742-52-5	30-40	no
Barium acetate No established exposure limits set by OSHA or ACGIH at this time	543-80-6	<2	no
Molybdenum disulfide 10mg/cubic meter OSHA TWA	1317-33-5	<2	suspected
Graphite 2mg/cubic meter ACGIH TLV	7782-42-5	<2	no
Mixed barium Monocarboxylates 0.5mg/cubic meter ACGIH TWA for barium (cas# 7440-39-3)	proprietary mixture	20-30	no

Section 6: Health Hazard Data

Inhalation: Not expected to pose a significant hazard under normal ambient conditions. However, vapors may occur upon heating and may cause irritation to the mucous membranes of the nose, throat, and lungs if inhaled.

Eye Contact: Expected to cause irritation and redness.

Skin Contact: May cause irritation and redness.

Ingestion: May cause irritation and burning of the gastrointestinal tract.

Summary of Acute Hazards: Not expected to pose a significant hazard.

Summary of Chronic Hazards: NAIF

Special Health Effects: Personnel with pre-existing skin disorders should avoid contact with this product.

Section 7: First Aid Procedure

Inhalation: Remove to fresh air. Call a physician if irritation persists.

Eye Contact: Immediately flush with large quantities of water for at least 15 minutes and call a physician.

Skin Contact: Wipe off excess material with cloth or paper towels. Wash thoroughly with soap and water.

Ingestion: Contact a physician immediately.

Other: NAIF

Section 8: Control Measures

Inhalation: Adequate ventilation or NIOSH/MSHA approved respirators to meet exposure limits.

Eye: Goggles or full face sheild

Skin: Nitrile gloves and protective clothing

Other: NAIF

Section 9: Special Precautions

Special Precautions: NAIF

Abbreviations: NA = Not applicable; NAIF = No applicable information found; NDA = No data available.

The data and recommendations presented herein are based on the information provided to us by the ingredient supplier and believed to be accurate. We do not assume any responsibility for the use of this material. The buyer assumes all risk and liability. The buyer accepts and uses this material based upon these conditions.

Southwestern Petroleum Corporation • 534 North Main Street • Fort Worth, Texas 76106 USA

Material Safety Data Sheet

Product Trade Name: 201 Multi-Purpose Gear Lube **Revision Date:** 5/09/03
Emergency Phone Number: CHEMTREC 1-800-424-9300
Chemical Family: Petroleum Hydrocarbon Based Lubricant

Section 1: Fire and Explosion Hazards

NFPA Codes – Health: 1 **Fire:** 1 **Reactivity:** 0 **Other:** NAIF
Flash Point, °C: >179 **Method:** C.O.C. **Auto Ignition Temp. , °C:** >260
Flammable Limits, %Volume – Lower: 0.9 **Upper. , °C:** 7
Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide.
Special Firefighting Procedures: Use water to keep fire-exposed container cool. Water spray may be used to flush spills away from exposures.
Unusual Fire & Explosion Hazards: Water or foam may cause frothing.

Section 2: Physical Data

Boiling Point: >293 ° C
Specific Gravity (Water = 1): 0.9
Water Solubility: No
Percent Volatile By Volume: None
Primary Volatiles: None
Odor: Lube oil odor
Appearance: Blue color
Melting Point: NA
Ph: NA
Vapor Density (Air = 1): >5

Section 3: Reactivity Data

Stability: Stable
Polymerization: Does not occur
Incompatibility: Strong oxidiants (as related to general organic materials)
Conditions To Be Avoided: Heat and ignition sources
Unusual Hazards: NAIF

Section 4: Spill and Disposal Handling

Spill: Use inert absorbant material to confine spills and to absorb material. Scoop into a disposable container.
Disposal: Land fill or incinerate as Federal, state, and local regulations permit.

Section 5: Hazardous Ingredients

Component:	CAS#:	%	Carcinogen
Petroleum lubricating oil Base stock	64742-57-0 64742-62-7 64742-54-7 64742-65-0 64742-55-8 64742-56-9 64741-88-4	100	no

Oil mist ACGIH 5mg/m3 TLV, 8 hours
10mg/m3 stel, 15 minutes
OSHA 5mg/m3 TWA, 8 hours

US DOT Shipping Description: Not Regulated

Section 6: Health Hazard Data

Inhalation: Vapor inhalation under ambient condition is normally not a problem.

Eye Contact: Irritation may occur.

Skin Contact: Prolonged and repeated contact has produced mild irritation and inflammation.

Ingestion: Low order of acute oral toxicity, but minute amounts aspirated into the lungs during ingestion may cause mild to severe pulmonary injury and possibly death.

Summary of Acute Hazards: Not expected to present a significant health hazard upon short term exposure.

Summary of Chronic Hazards: Prolonged and/or repeated contact with this material may produce mild skin irritation and inflamation.

Special Health Effects: Personnel with pre-existing skin disorders should avoid contact with this product.

Section 7: First Aid Procedure

Inhalation: Remove to fresh air; if breathing difficulties persist, obtain medical attention.

Eye Contact: Flush with water for 15 minutes, if pain or redness persist,obtain medical attention.

Skin Contact: Wash with soap and water after wiping off excess material.

Ingestion: Do not induce vomiting, call a physician immediately.

Other: NAIF

Section 8: Control Measures

Inhalation: Adequate ventilation or NIOSH/MSHA approved respirators to meet exposure limits.

Eye: Goggles or face shield

Skin: Gloves and protective clothing

Other: NAIF

Section 9: Special Precautions

Special Precautions: NAIF

Abbreviations: NA = Not applicable; NAIF = No applicable information found; NDA = No data available.

The data and recommendations presented herein are based on the information provided to us by the ingredient supplier and believed to be accurate. We do not assume any responsibility for the use of this material. The buyer assumes all risk and liability. The buyer accepts and uses this material based upon these conditions.

Southwestern Petroleum Corporation • 534 North Main Street • Fort Worth, Texas 76106 USA

Material Safety Data Sheet

Product Trade Name: 306 Supreme Formula Engine Oil **Revision Date:** 05/09/03
Emergency Phone Number: CHEMTREC 1-800-424-9300
Chemical Family: Petroleum Hydrocarbon Based Lubricant

Section 1: Fire and Explosion Hazards

NFPA Codes – Health: 1 **Fire:** 1 **Reactivity:** 0 **Other:** NAIF
Flash Point, °C: >179 **Method:** C.O.C. **Auto Ignition Temp., °C:** >260
Flammable Limits, %Volume – Lower: 0.9 **Upper., °C:** 7
Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide.
Special Firefighting Procedures: Use water to keep fire-exposed container cool. Water spray may be used to flush spills away from exposures. Use self-contained breathing apparatus.
Unusual Fire & Explosion Hazards: Water or foam may cause frothing. H2s may be produced above 121 °C.

Section 2: Physical Data

Boiling Point: >293 ° C
Specific Gravity (Water = 1): 0.9
Water Solubility: No
Percent Volatile By Volume: None
Primary Volatiles: None
Odor: Lube oil odor
Appearance: Purple
Melting Point: NA
Ph: NA
Vapor Density (Air = 1): >5

Section 3: Reactivity Data

Stability: Stable below 121 °C
Polymerization: Does not occur
Incompatibility: Strong oxidants (as related to general organic materials)
Conditions To Be Avoided: Heat and ignition sources
Unusual Hazards: H2s may be produced above 121 °C.

Section 4: Spill and Disposal Handling

Spill: Use inert absorbant material to confine spills and to absorb material. Scoop into a disposable container.

Disposal: Land fill or incinerate as Federal, state, and local regulations permit.

Section 5: Hazardous Ingredients

Component:	CAS#:	%	Carcinogen
Distillates, solvent refined Heavy paraffinic	64742-57-0 64742-54-7 64742-55-8 64741-88-4 64742-62-7 64742-56-9	>94	no
Oil mist – ACGIH – 5mg/m3 TLV, 8 hours 10mg/m3 stel, 15 minutes OSHA, -5mg/m3 TWA, 8 hours			
Zinc alkyl dithio phosphate (Phosphorodithioic acid, Zinc salt)	68649-42-3	<2	no

No OSHA or ACGIH limits have been established.

This chemical is subect to the reporting requirements of Section 313, SARA Title III, (40 CFR, part 72) as a zinc compound.

Note: Repeated contact with ZDDP has produced adverse testicular effects in rabbits. Recent studies, however, indicate that this is a stress reaction only. Similar tests in rats do not indicate any testicular effects. Furthermore, rats are now recognized as more appropriate for this type of testing.

Section 6: Health Hazard Data

Inhalation: Vapor inhalation under ambient condition is normally no a problem.

Eye Contact: Irritation may occur.

Skin Contact: Prolonged and repeated contact has produced mild irritation and inflammation.

Ingestion: Low order of acute oral toxicity, but minute amounts aspirated into the lungs during ingestion may cause mild to severe pulmonary injury and possibly death.

Summary of Acute Hazards: Not expected to present a significant health hazard upon short term exposure.

Summary of Chronic Hazards: Prolonged and/or repeated contact with this material may produce mild skin irritation and inflamation.

Special Health Effects: Personnel with pre-existing skin disorders should avoid contact with this product.

Section 7: First Aid Procedure

Inhalation: Remove to fresh air; if breathing difficulties persist, obtain medical attention.

Eye Contact: Flush with water for 15 minutes, if pain or redness persist,obtain medical attention.
Skin Contact: Wash with soap and water after wiping off excess material.
Ingestion: Do not induce vomiting, call a physician immediatley.
Other: NAIF

Section 8: Control Measures

Inhalation: Adequate ventilation or NIOSH/MSHA approved respirators to meet exposure limits.
Eye: Goggles or face shield
Skin: Gloves and protective clothing
Other: NAIF

Section 9: Special Precautions

Special Precautions: NAIF

Abbreviations: NA = Not applicable; NAIF = No applicable information found; NDA = No data available.

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Southwestern Petroleum Corporation • 534 North Main Street • Fort Worth, Texas 76106 USA

Material Safety Data Sheet

Product Trade Name: 707 Reciprocating Compressor Oil **Revision Date:** 5/09/03
Emergency Phone Number: CHEMTREC 1-800-424-9300
Chemical Family: Petroleum Hydrocarbon Based Lubricant

Section 1: Fire and Explosion Hazards

NFPA Codes – Health: 0 **Fire:** 1 **Reactivity:** 0 **Other:** NAIF
Flash Point, °C: >181 **Method:** C.O.C. **Auto Ignition Temp. , °C:** 315°C
Flammable Limits, %Volume – Lower: NDA **Upper. , °C:** NDA
Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide.
Special Firefighting Procedures: Use water to keep fire-exposed container cool. Water spray may be used to flush spills away from exposure.
Unusual Fire & Explosion Hazards: Water or foam may cause frothing.

Section 2: Physical Data

Boiling Point: >232 ° C
Specific Gravity (Water = 1): 0.93
Water Solubility: No
Percent Volatile By Volume: None
Primary Volatiles: None
Odor: Lube oil odor
Appearance: Amber color
Melting Point: NA
Ph: NA
Vapor Density (Air = 1): >10

Section 3: Reactivity Data

Stability: Stable
Polymerization: Does not occur
Incompatibility: Strong oxidants (as related to general organic materials)
Conditions To Be Avoided: Heat and ignition sources
Unusual Hazards: NAIF

Section 4: Spill and Disposal Handling

Spill: Use inert absorbant material to confine spills and to absorb material. Scoop into a disposable container.
Disposal: Land fill or incinerate as Federal, state, and local regulations permit.

Section 5: Hazardous Ingredients

Component:	CAS#:	%	Carcinogen
Severely hydrotreated Napthenic distillates Oil mist ACGIH 5mg/m3 TLV, 8 hours 10mg/m3 stel, 15 minutes OSHA 5mg/m3 TWA, 8 hours	64742-52-5	>97	no

Section 6: Health Hazard Data

Inhalation: No significant adverse health effects are expected to occur upon short term exposure.

Eye Contact: Non-irritating on short-term exposure.

Skin Contact: Prolonged and repeated contact has produced mild irritation and inflammation.

Ingestion: No adverse health effect are expected to occur.

Summary of Acute Hazards: Not expected to present a significant health hazard upon short term exposure.

Summary of Chronic Hazards: Prolonged and/or repeated contact with this material may produce mild skin irritation and inflamation.

Special Health Effects: Personnel with pre-existing skin disorders should avoid contact with this product.

Section 7: First Aid Procedure

Inhalation: Remove to fresh air; if breathing difficulites persist, obtain medical attention.

Eye Contact: Flush with water for 15 minutes,if pain or redness persist, obtain medical attention.

Skin Contact: Wash with soap and water after wiping off excess material.

Ingestion: If more than half cup, give water , induce vomiting, obtain medical attention.

Other: NAIF

Section 8: Control Measures

Inhalation: Adequate ventilation or NIOSH/MSHA approved respirators to meet exposure limits.

Eye: Goggles or face shield

Skin: Gloves and protective clothing

Other: NAIF

Section 9: Special Precautions

Special Precautions: NAIF

Abbreviations: NA = Not applicable; NAIF = No applicable information found; NDA = No data available.

The data and recommendations presented herein are based on the information provided to us by the ingredient supplier and believed to be accurate. We do not assume any responsibility for the use of this material. The buyer assumes all risk and liability. The buyer accepts and uses this material based upon these conditions.

APPENDIX D

MSDS SHEETS FOR POWDERED BARITE, LIMESTONE AND DOLOMITE

Q'MAX SOLUTIONS INC. "Largest Canadian Drilling Fluids Co

Q'MAX MATERIAL SAFETY DATA SHEET

Section I: IDENTIFICATION OF PRODUCT

Product Name:	**BARITE**
Product Use:	**Drilling Mud Additive**
Chemical Family:	**BARIUM SULPHATE; BARITE**
WHMIS CLASSIFICATION:	Not A Controlled Product Under WHMIS
WORK PLACE HAZARD:	Not Applicable
TDG CLASSIFICATION:	Not Dangerous Goods
PACKAGE GROUP:	Not Applicable
PIN:	Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	l
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT • INHALATION INGE

ACUTE (Short Term Exposure):	Cough if exposed to dust at levels higher than TLV's
CHRONIC (Long Term Exposure):	According to Mountain Minerals Company Ltd., this Bar not contain respirable crystalline silica in amounts cons significant under WHMIS guidelines.

Section IV: FIRST AID MEASURES

No first aid measures are suggested for Chronic (long term exposure). For Acute (short term exposi remove patient from dusty environment.

SKIN:	Wash with soap and water. If adverse symptoms devel medical attention.
EYE:	Flush eyes with running water for at least 15 minutes. symptoms develop, siik medical attention.
INHALATION:	Remove to fresh air.
INGESTION:	No ill effects expected.

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Grey white powder; Dirt-dust like odour
SPECIFIC GRAVITY:	4.20 +
BOILING POINT (°C):	Not Applicable
MELTING POINT (°C):	Not Applicable
SOLUBILITY IN WATER:	Insoluble
pH @ 1.0%:	7 - 8
PERCENT VOLATILE BY VOLUME:	Not Applicable
EVAPORATION RATE:	Not Applicable
VAPOUR PRESSURES (mm Hg):	N/A
VAPOUR DENSITY (Air=1):	N/A

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not Applicable

FLAMMABLE LIMITS:	Not Applicable
EXTINGUISHING MEDIA:	Not Applicable
SPECIAL FIRE FIGHTING PROCEDURES:	Not Applicable
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	Not Applicable

Section VII: REACTIVITY DATA

STABILITY	Stable	•	Unstable
INCOMPATIBILITY (conditions to avoid):	None		
HAZARDOUS DECOMPOSITION PRODUCTS:	None		
HAZARDOUS POLYMERIZATION:	Will not occur	•	May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	Suggest NIOSH/MSHA approved respirators for silica b
VENTILATION:	Yes, if practical; personal air supply may be useful
PROTECTIVE GLOVES:	None required
EYE PROTECTION:	Suggest goggles
OTHER PROTECTIVE EQUIPMENT:	Chemical resistant clothing recommended.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid breathing dust; wear an approved respirator. Practice reasonable caution and personal cleanl Avoid eye contact.

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

Vacuum or sweep-up if dry, reuse if not contaminated.

WASTE DISPOSAL METHOD

Dispose of material in a manner to prevent generating dust.

Section IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied, is m

DATE ISSUED:	December 1, 1993
BY:	Product Safety Committee
DATE UPDATED:	October 1, 1999

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Q'MAX SOLUTIONS INC. 'Largest Canadian Drilling Fluids Co.

Q'MAX MATERIAL SAFETY DATA SHEET

Section I: IDENTIFICATION OF PRODUCT

Product Name:	**BARITE**
Product Use:	**Drilling Mud Additive**
Chemical Family:	**BARIUM SULPHATE; BARITE**
WHMIS CLASSIFICATION:	Not A Controlled Product Under WHMIS
WORK PLACE HAZARD:	Not Applicable
TDG CLASSIFICATION:	Not Dangerous Goods
PACKAGE GROUP:	Not Applicable
PIN:	Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	I
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN • EYE CONTACT • INHALATION INGE

ACUTE (Short Term Exposure):	Cough if exposed to dust at levels higher than TLV's
CHRONIC (Long Term Exposure):	According to Mountain Minerals Company Ltd., this Bar not contain respirable crystalline silica in amounts cons significant under WHMIS guidelines.

Section IV: FIRST AID MEASURES

No first aid measures are suggested for Chronic (long term exposure). For Acute (short term exposi remove patient from dusty environment.

SKIN:	Wash with soap and water. If adverse symptoms devel medical attention.
EYE:	Flush eyes with running water for at least 15 minutes. symptoms develop, siik medical attention.
INHALATION:	Remove to fresh air.
INGESTION:	No ill effects expected.

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Grey white powder; Dirt-dust like odour
SPECIFIC GRAVITY:	4.20 +
BOILING POINT (°C):	Not Applicable
MELTING POINT (°C):	Not Applicable
SOLUBILITY IN WATER:	Insoluble
pH @ 1.0%:	7 - 8
PERCENT VOLATILE BY VOLUME:	Not Applicable
EVAPORATION RATE:	Not Applicable
VAPOUR PRESSURES (mm Hg):	N/A
VAPOUR DENSITY (Air=1):	N/A

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not Applicable

FLAMMABLE LIMITS:	Not Applicable
EXTINGUISHING MEDIA:	Not Applicable
SPECIAL FIRE FIGHTING PROCEDURES:	Not Applicable
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	Not Applicable

Section VII: REACTIVITY DATA

STABILITY	Stable	•	Unstable
INCOMPATIBILITY (conditions to avoid):	None		
HAZARDOUS DECOMPOSITION PRODUCTS:	None		
HAZARDOUS POLYMERIZATION:	Will not occur	•	May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	Suggest NIOSH/MSHA approved respirators for silica b
VENTILATION:	Yes, if practical; personal air supply may be useful
PROTECTIVE GLOVES:	None required
EYE PROTECTION:	Suggest goggles
OTHER PROTECTIVE EQUIPMENT:	Chemical resistant clothing recommended.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid breathing dust; wear an approved respirator. Practice reasonable caution and personal cleanl Avoid eye contact.

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

Vacuum or sweep-up if dry, reuse if not contaminated.

WASTE DISPOSAL METHOD

Dispose of material in a manner to prevent generating dust.

Section IX: PREPARATION

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Q'MAX SOLUTIONS INC. Largest Canadian Drilling Fluids Co.

Q'MAX MATERIAL SAFETY DATA SHEET

Section I: IDENTIFICATION OF PRODUCT

Product Name:	**CALCIUM CARBONATE** **(325, 0, Fine Grind, Hard Shell Ultra Fine, Glassro Grit, Poultry Grit, Supercal)**
Product Use:	**Drilling Mud Additive**
Chemical Family:	**CALCIUM CARBONATE**
WHMIS CLASSIFICATION:	Not A Controlled Product Under WHMIS
WORK PLACE HAZARD:	Not Applicable
TDG CLASSIFICATION:	Not Dangerous Goods
PACKAGE GROUP:	Not Applicable
PIN:	Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	I
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry:	SKIN	EYE CONTACT	INHALATION	INGE

THRESHOLD LIMIT VALUE:	None
EFFECTS OF OVEREXPOSURE:	None

Section IV: FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES: Treat as Nuisance Dust

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Grayish white solid - various sizes; dirt like odour
SPECIFIC GRAVITY:	1.4 - 1.7
BOILING POINT (°C):	Not Applicable
MELTING POINT (°C):	Not Applicable
SOLUBILITY IN WATER:	Not Available
pH @ 1.0%:	11.4 (1.0 Slurry)
PERCENT VOLATILE BY VOLUME:	Not Available
EVAPORATION RATE:	Not Applicable
VAPOUR PRESSURES (mm Hg):	Not Applicable
VAPOUR DENSITY (Air=1):	Not Applicable

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not Applicable
FLAMMABLE LIMITS:	Not Applicable
EXTINGUISHING MEDIA:	Dry chemical, Carbon dioxide, Foam and Water
SPECIAL FIRE FIGHTING PROCEDURES:	No special requirements
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	None

Section VII: REACTIVITY DATA

STABILITY	Stable	Unstable
INCOMPATIBILITY (conditions to avoid):	Aluminum potassium sulfate, amminium salta fluorine. may cause violent reaction or ignition.	
HAZARDOUS DECOMPOSITION PRODUCTS:	When heated over 820 C, emits calcium oxide fumes ai dioxide.	
HAZARDOUS POLYMERIZATION:	Will not occur •	May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	NIOSH/MESA mask; nuisance dust
VENTILATION:	No special requirements
PROTECTIVE GLOVES:	None required
EYE PROTECTION:	Goggles, if desired
OTHER PROTECTIVE EQUIPMENT:	None required

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in cool, dry well ventilated area out of direct contact with weather. Avoid ingestion. Practice r caution and personal cleanliness. Avoid creating dust. Wash all equipment with large amounts of wa vinegar.

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

Treat like sand spill; this material is not water soluble. Sweep or vacuum up.

WASTE DISPOSAL METHOD

Suggest landfill; this material is inert calcium carbonate. All waste should be disposed of according Provincial and Local regulations. Containers should NOT be reused. Containers should be disposed c accordance with government regulations.

Section IX: PREPARATION

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Q'MAX SOLUTIONS INC. Largest Canadian Drilling Fluids Co

Q'MAX MATERIAL SAFETY DATA SHEET

Section I: IDENTIFICATION OF PRODUCT

Product Name:	**GYPSUM**
Product Use:	**Drilling Mud Additive**
Chemical Family:	**Calcium Sulphate**
WHMIS CLASSIFICATION:	Not a Controlled Product Under WHMIS
WORK PLACE HAZARD:	Not Applicable
TDG CLASSIFICATION:	Not Dangerous Goods
PACKAGE GROUP:	Not Applicable
PIN:	Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	OSHA PEL	ACGIH TLV	LD(50)
No Hazardous Ingredients					

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGE

Gypsum dust presents no more hazard than any common dust and, accordingly, an exposure limit c milligrams per cubic meter has been established for a worker who spends 8 hours in such an atmos greater concentration levels than this special precautions must be taken or exposure times must be Gypsum dust is not hazardous to the skin or eyes but may cause skin dryness or eye irritation. If di get in the eyes, it can be washed out with cool, clean water.

Section IV: FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES: Treat as Nuisance Dust

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Light grey; odourless
SPECIFIC GRAVITY:	2.9
BOILING POINT (°C):	Not Applicable
MELTING POINT (°C):	1450°C
SOLUBILITY IN WATER:	Not Applicable
pH @ 1.0%:	6.5
PERCENT VOLATILE BY VOLUME:	Not Applicable
EVAPORATION RATE:	Not Applicable
BULK DENSITY (POWDER):	1272 kg/m³ (80 lbs/cu. ft.)
BULK DENSITY (GRANULAR):	1096 kg/m³ (68 lbs/cu. ft.)

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not Applicable
FLAMMABLE LIMITS:	Not Applicable
EXTINGUISHING MEDIA:	Water, Water Fog, Foam, Chemical, CO2
SPECIAL FIRE FIGHTING PROCEDURES:	No special requirements
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	None

Section VII: REACTIVITY DATA

STABILITY	Stable	•	Unstable
INCOMPATIBILITY (conditions to avoid):	Strong acids		
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon Dioxide		
HAZARDOUS POLYMERIZATION:	Will not occur	•	May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	NIOSH/MESA mask; nuisance dust
VENTILATION:	No special requirements
PROTECTIVE GLOVES:	Gloves or hand lotion (to avoid dry skin)
EYE PROTECTION:	Suggest goggles; nuisance dust
OTHER PROTECTIVE EQUIPMENT:	None required

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid ingestion. Practice reasonable caution and personal cleanliness.

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

Treat like sand spill; this material is not water soluble. Sweep or vacuum up.

WASTE DISPOSAL METHOD

Dispose of material in accordance with local ordinances. Landfill is suggested.

Section IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied, is m

DATE ISSUED:	December 1, 1993
BY:	Product Safety Committee
DATE UPDATED:	October 1, 1999

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Material Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY Dolomite (Calcium magnesium carbonate)
($CaCO_3$ * $MgCO_3$)
Dolomite (all sizes)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name and Address	Emergency Telephone Number	
Chemical Lime Company	Chemtrec 800-424-9300	
3724 Hulen Street	Information Phone Number	Date Prepared
Fort Worth, Texas 76107	817-732-8164	8/29/02

Section II - Hazardous Ingredients/Identity Information

Hazardous Components	CAS	Common Name	OSHA PEL	ACGIH TLV	Other Limits	% (optional)
Dolomite	16389-88-1	Dolomite	15 mg/m3	10 mg/m3		>98%
Silicon dioxide	14808-60-7	Quartz	0.1 mg/m3	0.1 mg/m3	4 mg/m3	<2%

Section III - Physical/Chemical Characteristics

Boiling Point	2850 °C	**Melting Point**	dec 730 °C	**Specific Gravity**	2.6 - 2.9 g/cc
Vapor Pressure (mm Hg)	N.A.	**Vapor Density**	N.A.	**Evaporation Rate**	N.A.

Solubility in Water Not soluble in water. pH = 8-9 @ 25°C

Appearance and Odor White or gray powder, lump or stone; odorless

Section IV - Fire and Explosion Hazard Data

Flash Point	LEL/UEL	Flammable Limits	Extinguishing Media
N.A.	N.A.	N.A.	Not Combustible - Use extinguishing agent for surrounding fire

Special Firefighting Procedures/Unusual Fire and Explosion Hazards
Material will not burn.

Section V - Reactivity Data

Stability	Conditions to Avoid (stability - related)
Stable	Material is stable

Incompatibility (Materials to Avoid)
Acids: Reacts with acids to form CO_2. Ignites on contact with fluorine.
Incompatible with ammonium salts and magnesium.

Hazardous Polymerization/Hazardous Decomposition of Byproducts Will not occur (none)

Section VI - Health Hazard Data

Route(s) of Entry: Inhalation, Ingestion

Health Hazards (Acute and Chronic)
Nuisance dust: Avoid eye contact and breathing dust. Eye contact will cause irritation to occur, breathing will cause coughing, sneezing, or inflammation.

Carcinogenicity: **OSHA?** SiO_2 **NTP/IARC Monographs?** SiO_2

Respirable crystalline silica from occupational sources is classified by IARC as a Group I Carcinogen.
California Proposition 65: Silica is on the Governor's Proposition 65 list. Components used in this product may contain trace amounts of inherent naturally occurring elements (such as, but not limited to arsenic, cadmium) that are on the Governor's Proposition 65 list.

Section VI - Health Hazard Data (continued)

Signs and Symptoms of Exposure

Eye irritation; coughing or breathing problems.

Medical Conditions Generally Aggravated by Exposure

Respiratory problems, asthma, dermatitis or skin or eye sensitivity.

Emergency and First Aid Procedure

Flush contaminated area with excess water. If eye contact , rinse eye with eye wash solution or excess water and seek medical attention immediately.

Section VII - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled

Sweep up and avoid breathing dust. Keep away from acids and other incompatible material.

Place in metal container.

Waste Disposal Method

Dispose of contaminated material based on other contaminates.

Precautions to be Taken in Handling and Storage

Keep away from acids and other incompatible materials.

Other Precautions

Avoid eye contact and breathing dust.

NFPA Rating:	HEALTH: 1	FLAMMABILITY: 0	REACTIVITY: 0
HMIS Rating:	HEALTH: 1	FLAMMABILITY: 0	REACTIVITY: 0
WHMIS Rating:	D2A		

Section VIII - Control Measures

Respiratory Protection (Specify Type)

Dust masks meeting the NIOSH N95 rating are sufficient for casual exposure. (42 CFR)

Ventilation	**Local Exhaust** Vent to dust collector	**Special**	Do not dispose of dust with combustible materials.
	Mechanical (General) Vent to meet TLV requirements	**Other**	

Protective Gloves	**Other Protective Clothing or Equipment**
Dry cloth or leather gloves	Full clothing to cover arms and legs, safety glasses or face shield.

Work/Hygienic Practices

Eye wash and shower station should be readily available.

References: Sax, N.I. & R.J. Lewis Sr. (1989) "Dangerous Properties of Industrial Materials", New York: Van Nostrand Reinhold Co. Ltd.
Lewis, R.J. (1997) "Hazardous Chemicals Desk Reference", New York: Van Nostrand Reinhold Co. Ltd. KSA

APPENDIX E

PHOTOGRAPHS – CONSTRUCTION OF STORM WATER MANAGEMENT INFRASTRUCTURE

Photo 1: One of several settling ponds constructed at the Sheet Harbour Industrial Park as part of the storm water management plan infrastructure. Photo taken April 30, 1996.

Photo 2: Construction of a french drain on the east side of the Sheet Harbour Industrial Park.

Photo 3: Construction of a bermed ditch along the south side of the Sheet Harbour Industrial Park. Photo taken November 23, 1995.

Photo 4: Construction of a ditch on the east side of the Sheet Harbour Industrial Park. Photo taken November 23, 1995.