

Attachment 1



Avalon Rare Metals Inc.

CONCEPTUAL AQUATIC EFFECTS MONITORING PLAN

**Prepared for:
AVALON RARE METALS INC.**

**Prepared by:
EBA, A TETRA TECH COMPANY**

FEBRUARY 2012

ISSUED FOR USE

FILE: V15101007.004

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TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 AEMP STUDY DESIGN FRAMEWORK	2
2.1 Stating the Problem	2
2.2 Identifying the Goals of the Study	2
2.3 Identifying the Information Inputs and Defining the Boundaries of the Study	5
2.3.1 Water Quantity	7
2.3.2 Water Quality	8
2.3.3 Action Levels	9
2.4 A Conceptual Design for Obtaining Data.....	9
2.4.1 Metal Mining Effluent Regulations	10
2.4.1.1 Effluent Characterization	10
2.4.1.2 Effluent and Water Quality Monitoring Studies.....	10
2.4.1.3 Biological Monitoring Studies	11
2.4.1.4 MMER Sampling Locations	11
2.4.2 Water Licence.....	13
2.4.2.1 Surveillance Network Program	13
2.4.3 Additional Monitoring Initiatives	16
2.4.4 Monitoring Summary.....	18
3.0 MANAGEMENT RESPONSE PLANNING.....	18
4.0 CLOSURE.....	19
REFERENCES.....	20
 TABLES	
Table 1	Thor Lake Project: Nechalacho Mine and Flotation Plant Site Environmental Issue Matrix
Table 2	Proposed SNP Surface Water Sampling Locations and Sampling Frequency
Table 3	Summary of AEMP Sampling Program
 FIGURES	
Figure 1	Aquatic Pathways of Effects for the Construction Phase of the Nechalacho Mine Site
Figure 2	Aquatic Pathways of Effects for the Operations Phase of the Nechalacho Mine Site
Figure 3	Nechalacho Mine Site Study Area.....
Figure 4	Proposed MMER Sampling Stations
Figure 5	Annual Watershed Flowsheet Mine Operations
Figure 6	Proposed SNP Sampling Sites.....
 APPENDICES	
Appendix A	EBA's General Conditions

1.0 INTRODUCTION

Avalon Rare Metals Inc. proposes to mine, mill, and produce rare earth carbonate and oxides, zirconium, niobium and tantalum oxides from the Nechalacho deposit, located on its Thor Lake Property. The proposed project is referred to as the Thor Lake Project (the Project).

Approximately 12-14 million tonnes of mineral resources will be mined from the Nechalacho deposit over a period of about 20 years of operations. Construction will begin 16-18 months before the start of operations. At the end of mine life, reclamation activities will begin and continue for a period of about three years.

The proposed TLP has two main site components: an underground mine and flotation plant (Nechalacho Mine and Flotation Plant site), to be located at the Thor Lake Property, and a hydrometallurgical plant (Hydrometallurgical Plant site) to be located at the existing brownfields site of the former Pine Point Mine, 85 km east of Hay River, NT on the south shore of Great Slave Lake (Figure 1).

Rare earth elements (REEs) will be mined underground and concentrated at the Nechalacho Mine and Flotation Plant site. The resulting REE concentrates will be barged during the summer months across the east end of Great Slave Lake to the Hydrometallurgical Plant site. Upon arrival, the concentrate will be trucked from the south shore of Great Slave Lake to the Hydrometallurgical Plant site via a short (8 km) haul road. The concentrate will be further processed at the Hydrometallurgical Plant. The resulting final products will be hauled to the Hay River railhead in sealed containers via truck, and direct shipped by the CN railway for further processing in the south.

The Developer's Assessment Report (DAR; Avalon 2011) for this Project provides a full description of the project, baseline environmental study results, effects assessments, and an outline of the proposed aquatic effects monitoring program (AEMP).

The present conceptual (framework) report is the next step in developing a comprehensive AEMP for this Project. It generally follows Indian and Northern Affairs Canada (now Aboriginal Affairs and Northern Development Canada) *Recommended Procedures for Developing Data Quality Objectives and a Conceptual Study Design* (INAC 2009), which is one of a series of guidance documents for the design and preparation of AEMP programs in the NWT.

The initial phase in the development of an AEMP involves a multidisciplinary approach to defining the aquatic environmental issues that may result from the construction, operations, and decommissioning phases of a project, and identification of mitigation measures to avoid or minimize potential adverse effects. In anticipation of, and adherence to regulatory requirements, Avalon Rare Metals Inc. retained teams of specialist consultants to carry out multi-year baseline studies to characterize existing aquatic environmental conditions (Stantec 2010), and to consolidate existing information, assess potential effects, and recommend mitigation strategies (Avalon 2011).

The Effects assessment was guided by the Terms of Reference (TOR) issued by the Mackenzie Valley Environmental Impact Review Board (MVEIRB 2011), which identified specific Key Lines of Enquiry and required the description and assessment of effects based on all Project activities and phases. The information and data compiled as a result of these efforts form the basis for the preparation of a science based AEMP.

2.0 AEMP STUDY DESIGN FRAMEWORK

INAC (2009) identifies a number of Data Quality Objective steps in the preparation of a conceptual study design for an AEMP. The first four steps: stating the problem; identifying the goals of the study; identifying the information inputs; and, defining the boundaries of the study, have been covered by the design and implementation of the baseline studies and subsequent effects assessment, as described in the following sections:

2.1 Stating the Problem

The 'problem', or the potential aquatic consequences of the mine development, was the focus for the design of baseline studies necessary to evaluate project-related effects. The approach that was adopted for this step was to characterize as completely as possible, water and sediment quality, and phytoplankton, zooplankton, and fish within the predicted effects area of the Project, as well as within Reference water bodies. Corresponding studies were carried out to identify environmental stressors resulting from Project activities and then to quantify or model the probable effects of these stressors. Pathways of effects (PoE) diagrams illustrating Construction and Operations Phase activity-stressor-effect linkages were included in the DAR (Avalon 2011), and are reproduced below as Figures 1 and 2, respectively.

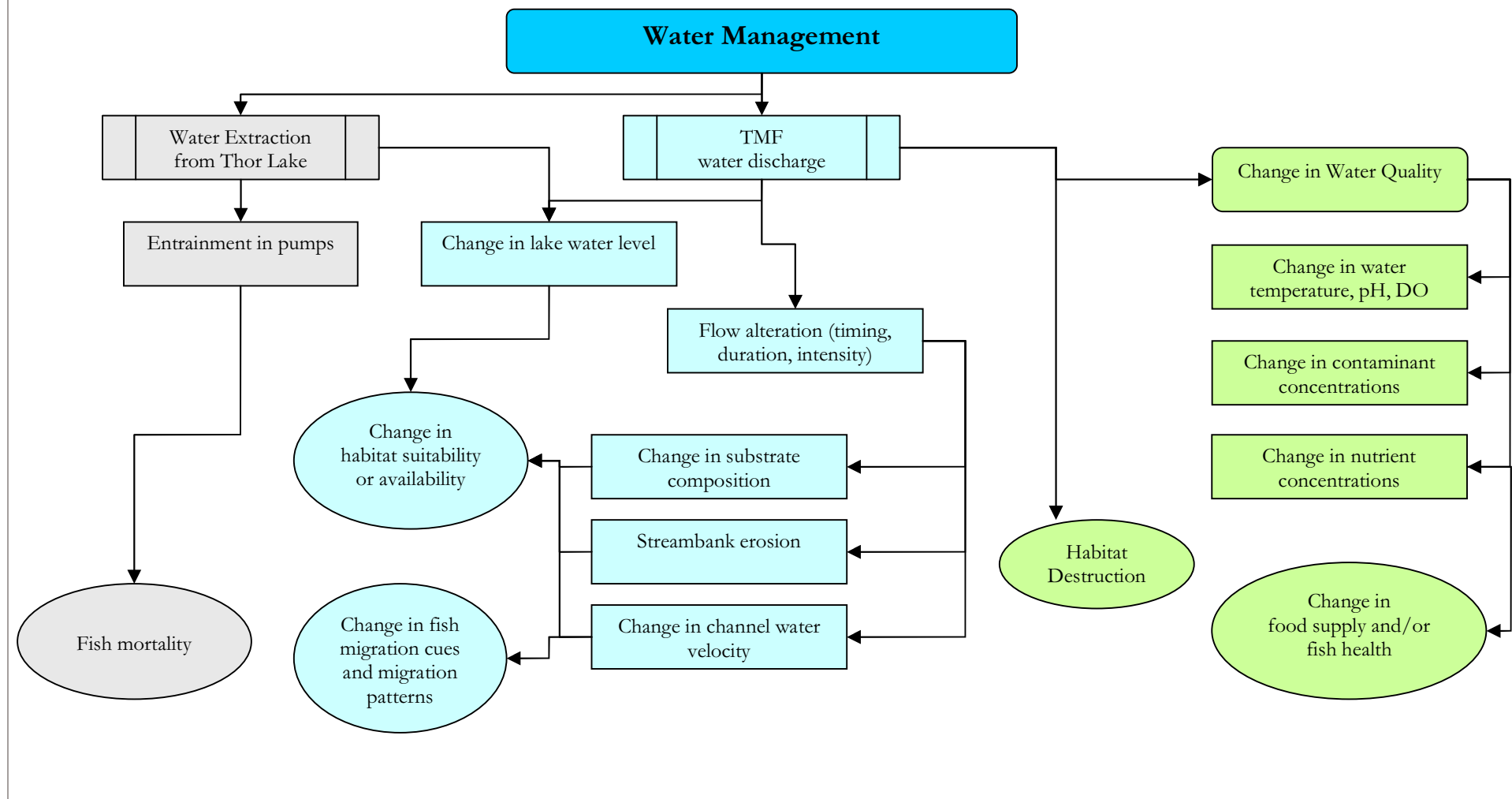
2.2 Identifying the Goals of the Study

This step involves identifying key questions or potential environmental issues that should be addressed as part of study design and implementation. This involves examining potential effects on the various components of the aquatic ecosystem based on anticipated terrestrial or aquatic habitat disturbances, and changes in water quality and quantity. For the purposes of the AEMP, identification of aquatic environmental sensitivities will lead to decisions regarding Action Levels, which are thresholds for the implementation of mitigation measures.

The DAR (Avalon 2011) discusses each issue (i.e. activity and stressor) that was identified during the scoping process in relation to potential effects, mitigation measures, residual effects, and the significance of the residual effects. These issues serve as the focus for the design of the monitoring program and the development of appropriate Action Levels, based on environmental component sensitivities, established guidelines, and background variability.

The key questions that provide the focus for aquatic background studies and the monitoring program include:

- How will water quantity, including total flows, lake levels, and seasonal flow patterns, be affected by water use and recirculation?
- What will be the effect on flows and flow patterns in downstream waterbodies due to the conversion of Ring, Buck, and Ball lakes to a Tailings Management Facility (TMF)?
- What are the potential stressors resulting from construction activities (i.e. land development), and what are the aquatic components/variables that might be affected by these stressors?
- Which aquatic organisms should the baseline studies include, and which would be suitable as sentinel organisms for the AEMP?



LEGEND

- Activity
- Stressor
- Effect

NOTES

1.

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THOR LAKE PROJECT

Aquatic Pathways of Effects for the Operations Phase of the Nechalacho Mine Site

PROJECT NO.
V15101007.004

OFFICE
EBA-VANC

DWN
SL

DATE
November 30, 2011

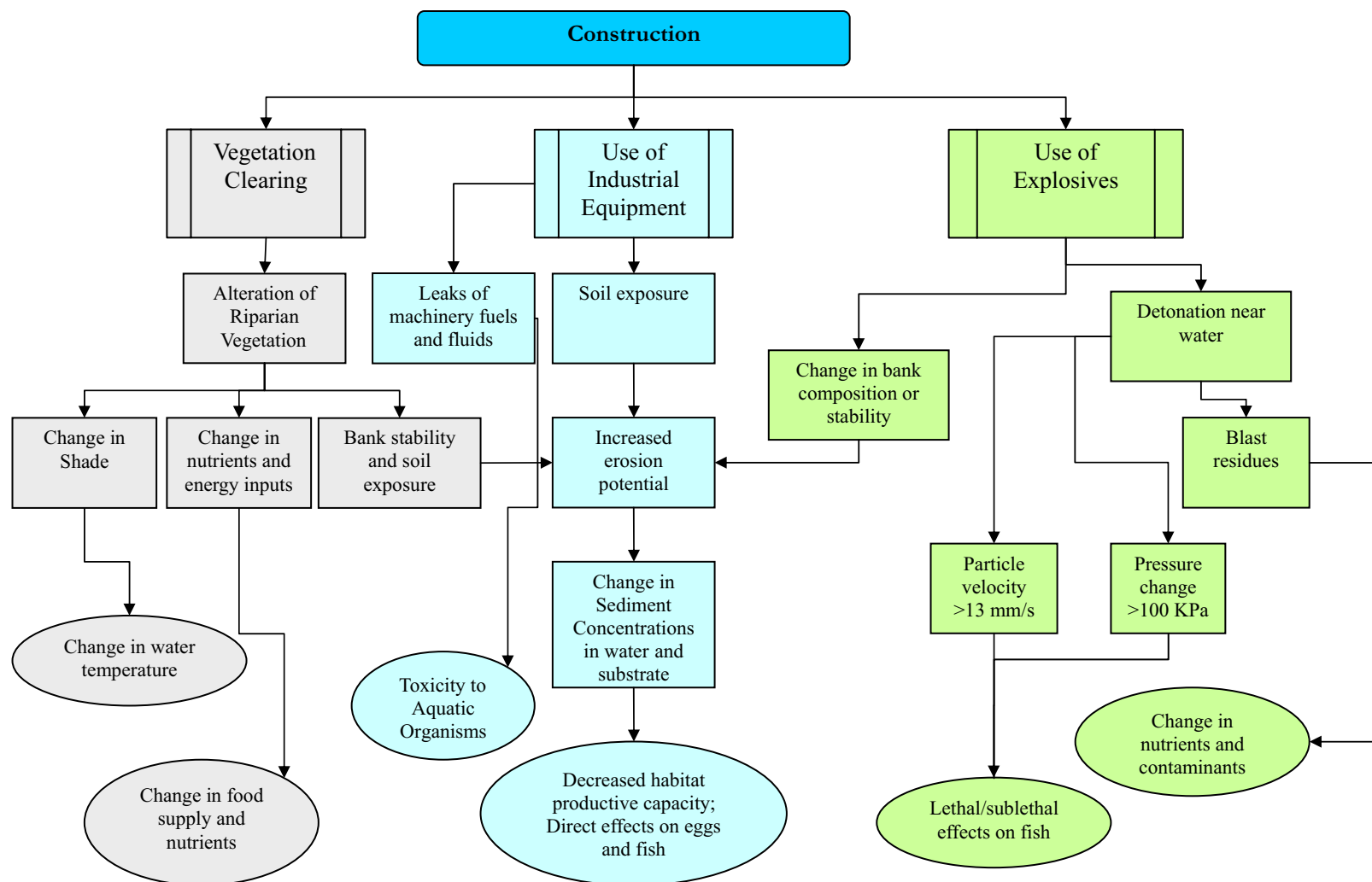
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


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Figure 2

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LEGEND

-  Activity
-  Stressor
-  Effect

NOTES

1.

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THOR LAKE PROJECT

Aquatic Pathways of Effects for the Construction Phase of the Nechalacho Mine Site

PROJECT NO.
V15101007.004

OFFICE
EBA-VANC

DWN
SL

DATE
November 30, 2011

CKD
DM

APVD
DM

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Figure 1

- What are the chemical parameters in the effluent that have the potential to adversely affect aquatic organisms downstream of the final discharge location, and what is the potential downstream effect of predicted concentrations of these parameters, based on the integration of effluent concentrations and probable flow levels ?
- Will routine barging activities affect water or habitat quality in Great Slave Lake?

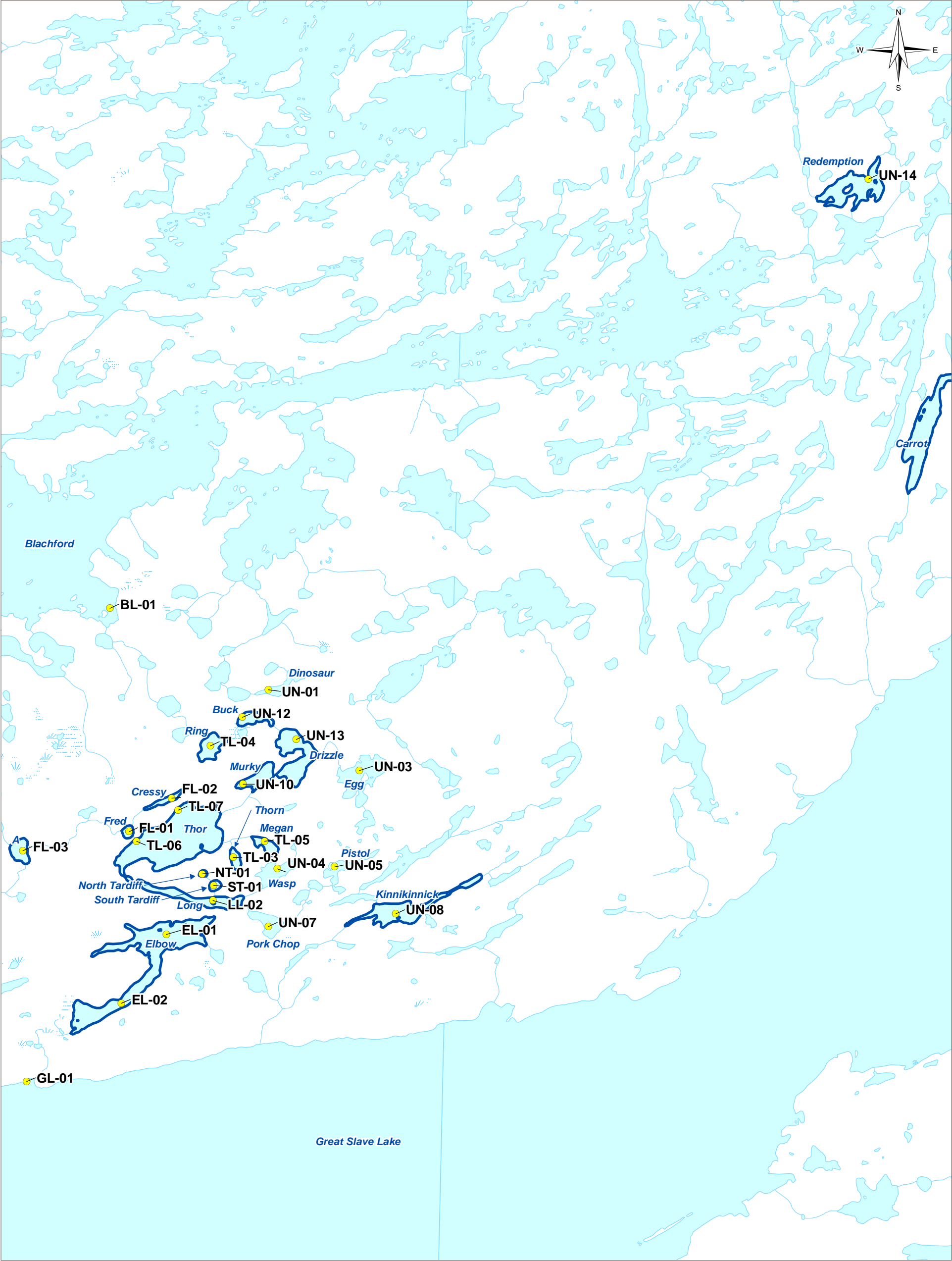
2.3 Identifying the Information Inputs and Defining the Boundaries of the Study

Responses to the issues raised by the above questions are provided throughout the DAR (Avalon 2011). Recent baseline studies that were conducted between 2008 and 2010 (Stantec 2010) included investigations of water quality, aquatic ecology (phytoplankton, zooplankton, benthic invertebrates), and fish and fish habitat studies in 26 lakes. In addition, the field program included fish and fish habitat investigations in 13 stream channels between lakes in the footprint area. The waterbodies were selected as being potentially affected by the Project; representing local aquatic conditions; and, potentially suitable as reference lakes.

Aquatic and fisheries sampling locations were selected based on the direct Project footprint, potential future expansion, and known information about the surface water drainage in the Nechalacho Mine site area. All lakes and streams that would potentially directly interact with the mine footprint and operations (i.e., lakes above the underground excavations, and lakes and streams affected by water extraction and/or discharge), tailings storage areas, and concentrate transport routes were selected, as was the first lake downstream of the mine area.

Sampled lakes are shown on Figure 3 (reproduced from the DAR (Avalon 2011)). Kinnikinnick Lake was selected as a suitable near-field reference lake, while Redemption Lake, located approximately 18 km northeast of the Nechalacho Mine site camp, was chosen as an appropriate far-field reference lake.

Table 1 (reproduced from the DAR (Avalon 2011)) identifies the environmental issues potentially resulting from the various activities associated with mine development. It is apparent that many of these activities may interact with natural water resources.



LEGEND

- Aquatic Sample Station
- Fisheries Lake
- Watercourse
- Waterbody
- Wetland

NOTES
Figure Source: Appendix A, Figure 3-1, Stantec 2010c.

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THOR LAKE PROJECT

Nechalacho Mine Site Study Area


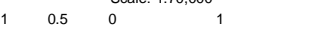

PROJECTION UTM Zone 12		DATUM NAD83		CLIENT  AVALON RARE METALS INC.	
Scale: 1:70,000  Kilometres				 eba A TETRA TECH COMPANY	
FILE NO. V15101007_004_Map001_ThorSA.mxd					
PROJECT NO. V15101007.004	DWN SL	CKD DM	APVD DM		
OFFICE EBA-VANC		DATE December 6, 2011			Figure 3

Figure 3

Table 1: Thor Lake Project: Nechalacho Mine and Flotation Plant Site Environmental Issue Matrix

Project Component	Air Quality	Water Quality	Fish	Wildlife	Vegetation
Site Preparation and Construction	✓	✓	✓	✓	✓
Underground Mining	✓	✓			
Mine Rock Storage		✓	✓	✓	✓
Acid Rock Drainage (ARD) if present		✓	✓		
Thor Lake Flotation Plant	✓	✓	✓	✓	✓
Power Generation	✓			✓	✓
Sewage		✓	✓		
Tailings Containment		✓	✓	✓	✓
Water Supply/Water Management		✓	✓		
Solid and Hazardous Waste Management	✓	✓	✓	✓	
Airstrip	✓			✓	✓
Access Roads	✓	✓	✓	✓	✓
Temporary Docking Facility		✓	✓	✓	✓
Seasonal Barge Traffic	✓	✓	✓	✓	

The assessment determined that for all valued ecosystem components (VEC), with the application of the proposed mitigation measures, the residual environmental effects of the Thor Lake Project were anticipated to be negligible and insignificant. Furthermore, any identified environmental effects were generally limited to the immediate footprints and local study areas of the Nechalacho Mine and Flotation Plant and associated infrastructure, and most were reversible once activities ceased. The AEMP, based on the framework identified in this document, is intended to confirm the assessment conclusion, and provide an approach to resolve unanticipated adverse effects.

The following subsections provide further information regarding the key aquatic environmental issues and questions resulting from the assessment of the Project.

2.3.1 Water Quantity

- Mine water and Plant site runoff will be collected and directed into the process as appropriate.
- All excess water released from the TMF will be returned to Thor Lake via the Drizzle Lake/Murky Lake drainage system.
- Water will be recycled from the TMF to the greatest extent possible to minimize the fresh water requirement (currently 50% recycle and 50% fresh water has been modelled).
- Extraction of fresh water from Thor Lake will be managed to conform to the 2010 Department of Fisheries and Oceans (DFO) Protocol for Winter Water Withdrawal (DFO 2010), which specifies the use of no more than 10% of the available under-ice water volume.
- Natural flows and conditions will be monitored and mimicked as closely as possible throughout operations to minimize possible effects on the local hydrological regime.

The development of a TMF within the Ring and Buck Lakes basin will result in slightly higher flows through Drizzle and Murky Lakes during operations, compared to pre-development baseline flows, assuming a 50% maximum recycle rate from the TMF. This increase is expected to be in the order of a 6% increase in flow at the start of operations. This initial increase is expected to slowly decline to an increase of about 3% in later years of operation as expected evaporation and tailings beach size increase.

2.3.2 Water Quality

A hydrodynamic model was run by EBA to predict the transport and fate of metals and nutrients. The modelled metals of concern were Mercury (Hg), silver (Ag), Aluminum (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Iron (Fe), Molybdenum (Mo), Nickel (Ni), Lead (Pb), Selenium (Se), and Zinc (Zn). Three radioactive metals, Uranium (U), Thorium (Th), and Radium-226 (Ra-226) were also included in the simulation. Nitrogen levels were also modeled due to the possible release of elevated levels of this nutrient originating from explosive chemicals (ANFO) used for underground mine blasting during the mining operation. The model also incorporated anticipated effluent phosphorous concentrations, as well as phytoplankton and herbivore zooplankton levels in Thor Lake, to determine downstream effects of possible nutrient enrichment.

The model predicts that the Metal Mining Effluent Regulation (MMER) effluent criteria for all parameters will be met over the entire 20 year simulation period, in each of the lakes within the Thor Lake system. Concentrations of metals reaching Thor Lake are predicted to be extremely low, especially since modelled concentrations represent conservative values, since no allowance was made in the model for decreases in concentration due to natural remediation processes including degradation, chemical oxidation, precipitation, and biodegradation.

The model predicts that the input of additional nitrogen from the TMF decant water to the Thor Lake system may lead to seasonally increased phytoplankton growth and concentration. Although the nitrogen level is predicted to continue to increase over the ten-year model simulation period, phytoplankton productivity appears to remain very similar from year to year. It also appears that the phytoplankton biomass is likely limited by the amount of bio-available phosphorus in the water body as the annual peak phytoplankton biomass remains stable even as the annual peak nitrogen values rise in the system. However, since the potential for seasonally increased primary and secondary production of the system exists, a major focus of the biological and water quality monitoring program will be identification of changes in phytoplankton, zooplankton, fish, and nutrient levels.

This step of the Framework also includes the identification of Action Levels, or values for “... a measurement endpoint that provides a basis for choosing one or more of the various management alternatives.” Action levels for effluent discharge at the final discharge point will be set for substances regulated by the MMER, namely: arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids, radium 226, and pH, and/or maximum levels identified in the Water Licence. In addition, periodic sampling pursuant to the MMER will also include analyses for aluminum, cadmium, iron, molybdenum, ammonia, nitrate, and mercury.

2.3.3 Action Levels

Action levels for metals and nutrients in water bodies downstream of the final discharge point will be guided by: the requirements of the Mackenzie Valley Land and Water Board (MVLWB) Water Licence, which may require the establishment of Surveillance Network Program (SNP) sampling locations; the Metal Mining Effluent Regulations (MMER); and, the Canadian Ministers of the Environment (CCME) Guidelines for the Protection of Aquatic Life (CCME 2007). The analysis of monitoring results will require the identification of background levels of those parameters which approach licence or guideline limits, since even relatively small additions of these substances could result in adverse effects to water quality and aquatic biota.

The MMER further requires periodic sublethal testing of effluent on fish, invertebrates, plants, and algae. The results of these tests provide a sensitive measure and early warning of potential biotic effects since it is the effluent that is tested, rather than the receiving waters, in which the effluent is diluted.

Action Levels for water discharges will be based on variances from predicted seasonal discharge levels from the TMF to Drizzle Lake. Differences of greater than 20% of predicted levels will require detailed assessments of causes, with consideration of natural precipitation and runoff variability.

The availability of background biological data from all potentially affected lakes and from two reference lakes provides the basis for a before-after control-impact (BACI) monitoring design to account for environmental variability and temporal trends found in both the control and exposure areas. Action levels will be based on multivariate statistical tests of significance.

2.4 A Conceptual Design for Obtaining Data

Data and information required to resolve the questions and issues identified in Section 2.2 of this report throughout all phases of the Project will be based, in part, on regulatory requirements and on studies intended to validate predictions and modelling results identified in the DAR (Avalon 2011). The following summarizes the regulatory environment pertaining to development and implementation of the AEMP for this project:

- The MMER identifies water sampling and analysis requirements, for effluent and receiving water bodies. In addition, the MMER includes requirements for sublethal toxicity testing and periodic environmental effects monitoring (EEM) involving biological sampling. The MMER regulates levels of particular substances in effluents.
- The MVLWB Water Licence for this Project will regulate water use, water discharge, and effluent and downstream water quality. Water and effluent quality sampling and analysis will be regulated through a Surveillance Network Program (SNP) that identifies sampling locations, scheduling, and required analyses. It may also include recommendations or requirements for additional studies targeting specific issues of concern.
- The *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), prohibits the harmful alteration, disruption or destruction of fish habitat (HADD), where fish habitat is inclusively defined as “spawning grounds and nursery, rearing, food supply, migration and any other areas on which fish

depend directly or indirectly in order to carry out their life processes.” Based on this prohibition, DFO may request plans or specifications as part of the AEMP to demonstrate that the Project is not adversely affecting the productive capacity of fish habitats.

- Although not part of legislation, the CCME Guidelines for the Protection of Aquatic Life (CCME 2007) are generally recognized as the established general biological effect levels in receiving water bodies. Their interpretation and application requires judgement based on site-specific conditions, particularly respecting ambient water quality conditions and biotic assemblages.

2.4.1 Metal Mining Effluent Regulations

Because the MMER provides very specific requirements for monitoring at metal mines, these will necessarily form the core of the AEMP developed for this Project.

2.4.1.1 Effluent Characterization

The elements of the MMER pertaining to characterization of the effluent include:

- Weekly effluent monitoring at the final discharge point for analysis of pH, arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids, and radium 226;
- Monthly acute lethality testing from samples of effluent collected at the final discharge point;
- Monthly *Daphnia magna* monitoring tests; and
- Monthly cumulative measurement of effluent volume at the final discharge point and calculation of effluent loading of the substances identified above.

The MMER also requires the design and implementation of environmental effects monitoring studies (EEM) partitioned into *effluent and water quality monitoring studies*, and *biological monitoring studies* as follows:

2.4.1.2 Effluent and Water Quality Monitoring Studies

- Quarterly sampling and analysis of the effluent at the final discharge point, for aluminum, cadmium, iron, mercury, molybdenum, ammonia, and nitrate, to further characterize the chemical composition of the effluent;
- Quarterly sampling of water from an exposure area in a receiving water body surrounding the point of entry of effluent into water from the final discharge point, for analysis of pH, hardness, alkalinity, as well as the substances noted above; and
- Twice yearly sublethal testing, based on specified criteria, of a fish species, an invertebrate species, a plant species, and an algal species, using effluent samples collected at the final discharge point.

2.4.1.3 Biological Monitoring Studies

The required biological monitoring studies involve site characterization, fish populations, fish tissue analysis, and assessment of the benthic invertebrate community. These studies are conducted at prescribed intervals, beginning about 18 months following mine start-up, and thereafter:

- every two years if effects on fish populations, fish tissue and the benthic community are detected;
- every three years if no effects are indicated from the previous study;
- every 72 months if no effects are detected from two previous consecutive studies; and
- within one year following notice of mine closure.

The biological monitoring studies are based on detailed study designs, which must be submitted and approved by Environment Canada following review by a technical advisory panel consisting of representatives of stakeholder agencies. These designs include details and justification for the proposed sampling methods, reference and exposure site locations, and analytical methods that will be followed during the study. As prescribed in the MMER, a detailed study design for each biological monitoring study will be submitted to Environment Canada a minimum of six months prior to the commencement of field sampling. It is anticipated that sampling for this program will normally occur in August.

The study design will include designation of a sentinel fish species, which will be selected in consultation with Environment Canada. Lake whitefish (*Coregonus clupeaformis*), which are common in Thor Lake, may be suitable as a sentinel species. However, due to the low productivity of northern waters, lethal sampling should be very limited to minimize the impact of the study on fish populations. All sampling and analysis will follow the methods recommended in the MMER guidance documents (Environment Canada 2002, 2011).

2.4.1.4 MMER Sampling Locations

Sampling locations proposed as part of MMER effluent characterization sampling and the EEM study program are shown in Figure 4. Effluent from the TMF will be discharged from the TMF outlet into Drizzle Lake. As such, this outlet represents the final discharge location for the proposed mine. Effluent discharges into the Thor Lake system will follow a path through Drizzle Lake to Murky Lake, and then into Thor Lake. Thor Lake discharges to Fred Lake and then follows an 18 km route through A Lake to Great Slave Lake. Based on this flow pattern, it is proposed that EEM biological monitoring study sites be established at Murky Lake, Thor Lake, and A Lake, to provide nearfield, midfield, and farfield sampling locations. Reference sites will be established at Kinnikinnick and Redemption lakes.

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LEGEND

- Effluent Characterization
- ⊠ EEM Biological Monitoring Site
- ⊠ Infrastructure Footprint

NOTES
1. Base footprint generated from data provided by Avalon (April 2011).
2. Base imagery provided by Avalon (October 2010).

STATUS
ISSUED FOR USE

THOR LAKE PROJECT

Proposed MMER Sampling Locations

PROJECTION UTM Zone 12		DATUM NAD83		
Scale: 1:20,000				
<div>2501250250500</div> <div><div></div></div> <div>Metres</div>				
FILE NO. V15101007_004_Map003_MMERSampling.mxd				
PROJECT NO. V15101007.004	DWN SL	CKD DM	APVD DM	REV 0
OFFICE EBA-VANC	DATE December 8, 2011			

Figure 4

2.4.2 Water Licence

The MVLWB, upon overall approval for the commencement of mining operations, will issue a Water Licence in accordance with the *Northwest Territories Water Act*. It is anticipated that the conditions of this Licence will:

- Require submission of monthly and annual volumes related to: water use, discharges of mine waste to the TMF, discharges of treated sewage to the TMF, and flow releases from the TMF;
- Set limits to water extraction from natural water bodies and identify pump screening specifications;
- Identify conditions related to the design, construction, and operation of the TMF;
- Establish effluent quality requirements; and
- Outline the SMP, including sampling locations and sampling and analysis requirements see Section 2.4.2.1).

The proposed water balance during mine operations is shown in Figure 5 (reproduced from Avalon 2011). Flows will be continuously monitored and reported, according to the schedule required by the Water Licence. In addition, water levels in Thor Lake will be monitored weekly to detect changes in lake level beyond those expected due to normal seasonal variation.

It is expected that the effluent quality criteria and sample scheduling identified in the Water Licence will, at a minimum, follow those listed in the MMER.

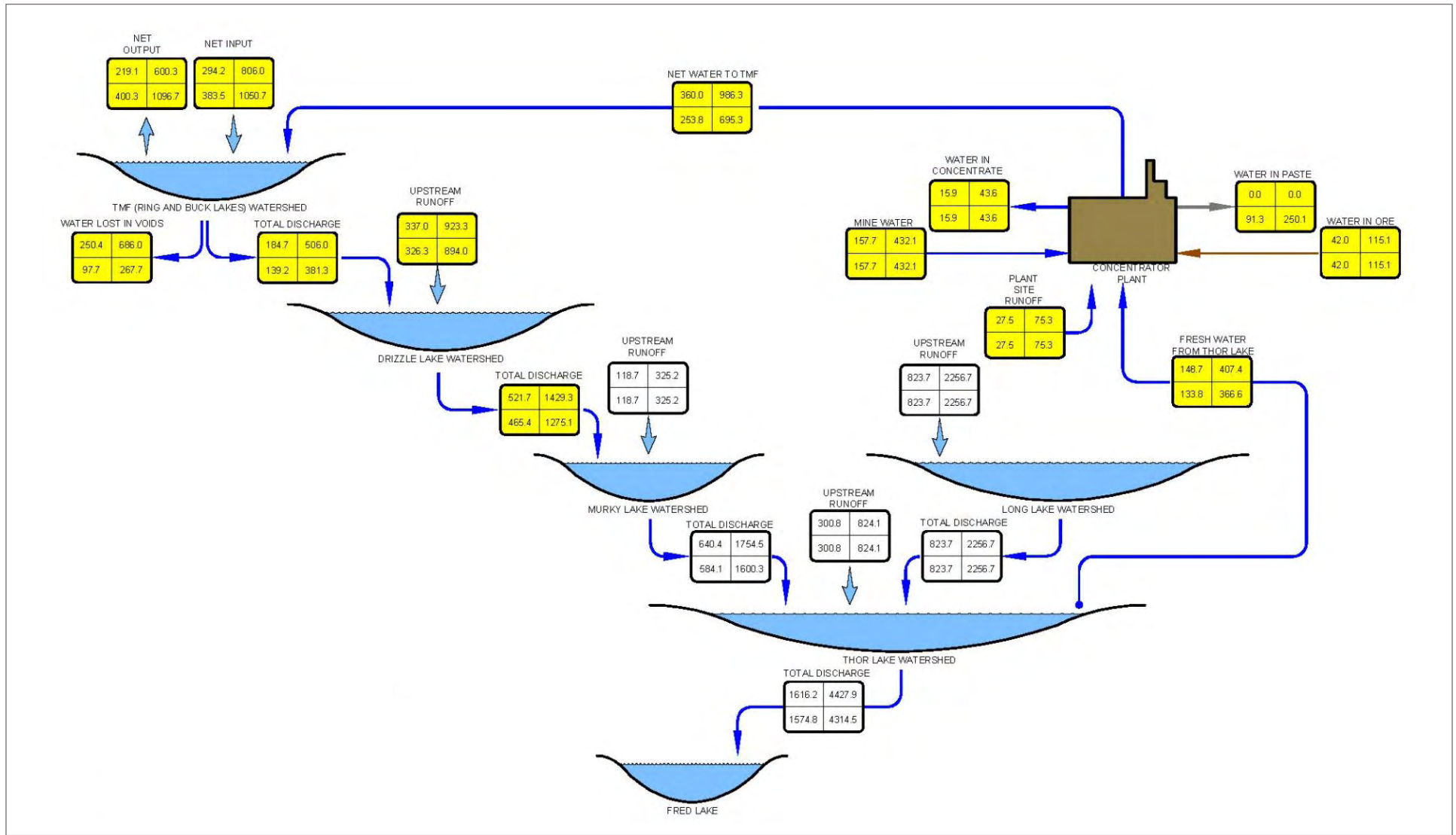
2.4.2.1 Surveillance Network Program

The SNP details regarding water sampling locations, timing, and analysis requirements will be issued with the Water Licence. The SNP is intended to provide frequent water quality monitoring within natural waterbodies that may be affected by Project activities with the purpose of providing early warning of degraded water quality conditions. Because this AEMP framework is intended to provide an outline of the proposed aquatic monitoring program, suggestions for sampling locations, scheduling, and analysis are included to complement the sampling program required under the MMER.

Table 2 indicates the sampling lakes, frequency and specific sites for the proposed SNP. All sites would be georeferenced to enable re-sampling at the same locations. Georeferenced sampling locations would be established at the following locations, as indicated in Figure 6: Drizzle, Murky, Thor (two locations), Long, Fred, A, Elbow, and Great Slave Lake (two locations). Drizzle, Murky, and Fred lakes are very shallow and may not have open water under the ice during winter.

Analysis should include major anions, alkalinity, total suspended solids (TSS), total dissolved solids (TDS), pH, conductivity, total metals, dissolved metals, total Kjeldahl nitrogen (TKN), nitrate and nitrite nitrogen, total phosphate, orthophosphate, and dissolved organic carbon (DOC). In addition, water samples should be analyzed for radionuclides including radium-226 (²²⁶Ra), radium-228 (²²⁸Ra), lead-210 (²¹⁰Pb), thorium-230 (²³⁰Th) and thorium-232 (²³²Th). Detection limits must be set to permit comparison with regulated limits, or in their absence, with CCME Guidelines for the Protection of Aquatic Life. It is recommended that the requirement to analyze for radionuclides be discontinued after three years of sampling if the levels of these elements are consistently below guideline or detection limits, and if no increasing trend is detected.

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LEGEND

ANNUAL FLOW IN THOUSAND m³/yr
AVERAGE FLOW IN m³/day

Years 1 to 4	1616.2	4427.9
Years 5 to 20	1574.8	4314.5

NOTES

1. Estimates are for average precipitation conditions and do not include extreme precipitation events.
2. Highlighted values are taken from KPL Memo Cont. No. NB10-00596.
3. Upstream runoff to each lake includes direct precipitation and evaporation on the lake.
4. Figure Source: Knight Piesold Consulting, March 2011 (Ref No. NB11-00132, Figure 5).

STATUS
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THOR LAKE PROJECT

Annual Watershed Flowsheet Mine Operations

PROJECT NO. V15101007.004	DWN SL	CKD RH	APVD DM	REV 0
OFFICE EBA-VANC	DATE December 6, 2011			

Figure 5

Table 2. Proposed SNP Surface Water Sampling Locations and Sampling Frequency

Location	Sample Frequency	Sample Site* (site no./Easting/Northing)
Drizzle	Monthly during open water season; December and March under ice (if open water is present)	Surface grab sample UN-13 418851 6888823
Murky	Monthly during open water season; December and March under ice (if open water is present)	Surface grab sample UN-10 417893 6887973
Thor	Monthly year round	Surface grab sample TL-06 415842 6886885 TL-07 416636 6887520
Fred	Monthly during open water season; December and March under ice (if open water is present)	Surface grab sample FL-01 415751 6887108
A	Monthly year round	Surface grab sample FL-03 413762 6886729
Long	Monthly year round	Surface grab sample LL-02 417273 6885871
Elbow	Monthly year round	Surface grab sample EL-01 416388 6885140 EL-02 415576 6883908
Great Slave Barge embayment	Monthly year round	Surface grab sample GL-01 413845 6882398
Great Slave At inflow from Thor L. system	Monthly year round	Surface grab sample location to be determined based on site examination
Kinnikinnick (reference)	Monthly year round	Surface grab sample UN-08 420757 6885658
Redemption (reference)	Monthly year round	Surface grab sample UN-14 429566 6899312

*Note: Site numbers and locations follow those of Stantec (2010; also reproduced in Avalon 2011).

Water quality analyses will be compared against background levels (Stantec 2010; Avalon 2011) and regulatory/guideline levels to identify exceedances presumably resulting from Project activities, or trends toward these levels. Exceedances or trends indicating deteriorating water quality conditions will result in an examination of the effluent discharge pathway to identify the source of the contaminant(s), and will initiate contingency plans that will be established to resolve such issues.

The construction phase of the Project may result in relatively short term effects on water quality and fish habitat, resulting from land disturbance involving vegetation removal, soil exposure, and blasting (see Figure 1), as well as the possible requirement to construct stream crossing structures for roads or pipelines. Construction, land clearance, and stream crossing activities will adhere to the DFO Land Development Guidelines for the Protection of Aquatic Habitat (DFO 1993) to avoid or minimize adverse effects. Similarly, blasting will follow the DFO blasting guidelines (DFO 1998) to avoid direct or indirect effects on fish or fish habitat.

The preliminary site layout design shows that infrastructure construction will be generally restricted to the northwest of the property, where overland drainage flows to Fred, Cressy, Thor, Ring, Buck, Ball, Drizzle, and Murky lakes (see Figure 4). During the construction phase, one or more environmental monitors will be retained to oversee construction activities, conduct water quality and habitat monitoring, and ensure implementation of the Construction Environmental Management Plan (EMP) and Environmental Protection Plan (EPP), which will be developed for this Project.

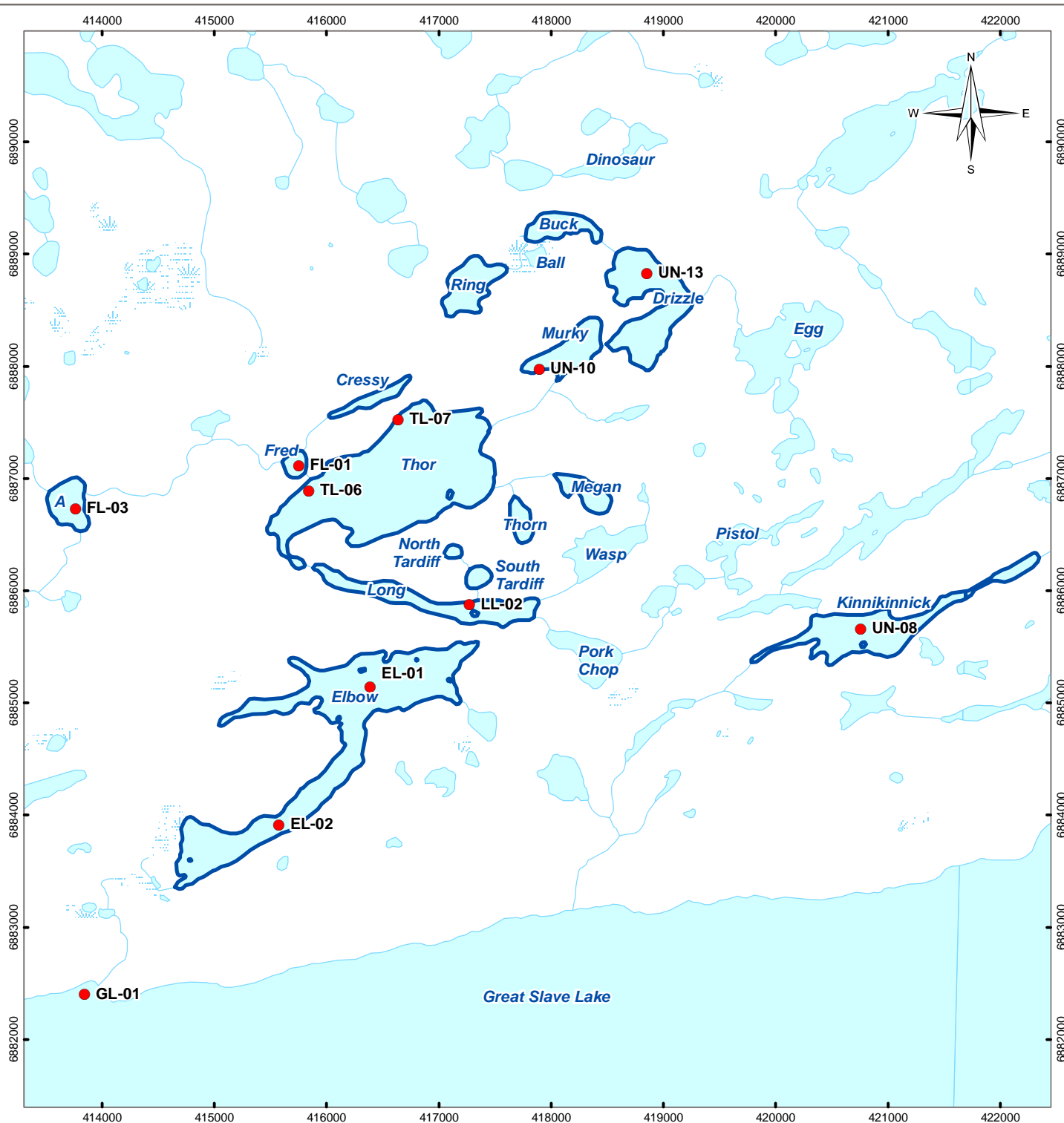
2.4.3 Additional Monitoring Initiatives

Fish and benthic invertebrate sampling, analysis, and assessment will be conducted as part of regulated MMER EEM studies. However, those sampling efforts generally occur every three years, which may not be sufficient to detect cumulative biotic effects resulting from chronic releases of deleterious substances. As such, this AEMP Framework includes annual sampling and analysis of phytoplankton, zooplankton, and benthic invertebrates at the locations identified in Table 2. Sampling for these organisms will follow the methods reported by Stantec (2010) to permit direct comparisons.

Changes to the community structure and abundance of organisms within each of these trophic levels can serve as a sensitive indicator of effects from a variety of factors, including water discharge, water quality, or habitat modifications. Cause and effect relationships can then be identified from an integration of the biological information with evidence provided by background, reference, and current water quality data.

Fish sampling is not recommended as part of this initiative. Fish are relatively slow growing and long lived, and as such, are not rapid indicators of environmental change. In addition, fish productivity in northern latitudes is restricted due to cold temperatures and the short growing season. As such, excessive sampling by gill netting can result in excessive mortalities and adverse effects on fish abundance.

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LEGEND

- Proposed SNP Sampling Site
- Fisheries Lake
- ~ Watercourse
- Waterbody
- Wetland

NOTES

1. Not shown: Redemption Lake and Great Slave Lake at the outflow from Thor Lake System.
2. Base data source: NTS 1:50,000 (Sheets 85I01 and 85I02).

STATUS
ISSUED FOR USE

THOR LAKE PROJECT

Proposed SNP Sampling Sites

PROJECTION

UTM Zone 12

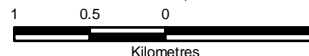
DATUM

NAD83

CLIENT



Scale: 1:50,000



FILE NO.

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PROJECT NO.

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DATE

December 12, 2011



Figure 6

2.4.4 Monitoring Summary

Table 3 summarizes the sampling that is proposed as part of the Thor Lake Project AEMP.

Table 3. Summary of AEMP Sampling Program

Reason for Sampling	Sampling for...	Location	Frequency
MMER	Effluent characterization (MMER regulated substances)	Final discharge point	Weekly
	Acute lethality testing	Final discharge point	Monthly
	<i>Daphnia magna</i> testing	Final discharge point	Monthly
	Cumulative effluent volume	Final discharge point	Monthly
	Effluent analysis (analyses other than MMER regulated substances)	Final Discharge Point	Quarterly
	Water quality (analyses other than MMER regulated substances)	Exposure area adjacent to final discharge point	Quarterly
	Sublethal testing of 4 trophic level organisms	Final discharge point	Twice yearly
	Biological monitoring studies (fish, invertebrates, sediments, water quality)	Murky, Thor, A, Kinnikinnick and Redemption lakes*	Variable (see Section 2.4.1.3) Usually every 3 years
SNP*	Water quality	13 locations in 10 lakes	Monthly
Avalon Initiative	Phytoplankton, zooplankton, benthic invertebrates	Same as SNP sampling sites	Annually

*Proposed

3.0 MANAGEMENT RESPONSE PLANNING

Adaptive Management, also called Management Response Planning (INAC 2009) for the Thor Lake Project will involve establishing alternative options in the event of regulatory or guideline exceedances, or if trends indicate deteriorating aquatic environmental conditions. Action levels will be determined in advance of project initiation in consultation with regulatory agencies.

During construction, contingencies included in the EMP and EPP will include the installation of replacement of additional silt fences, progressive revegetation where feasible, or the redirection of surface flows to sediment ponds. The presence of a full time environmental monitor will permit rapid responses to ongoing or potential adverse effects. The EMP and EPP will include procedures for the management of unanticipated spills of hazardous materials or elevated levels of suspended sediment in receiving water bodies.

A detailed Management Response Plan for the Operation and Decommissioning phases of the Project will be developed as part of the AEMP. This plan will involve preparation for unexpected adverse effects based on the results of project mitigation techniques as well as experiences at other, similar locations. Avalon will prepare remedial plans in the event that trends point toward potential negative changes in environmental indicators. Early indicators may include water chemistry parameters and/or shifts in lower trophic level

organisms and community structure, which have short generation times and react rapidly to changing environmental conditions. These plans may involve treatment of tailings, modification of TMF discharge levels or flow patterns, changes to plant operations, or any combination of these options.

Importantly, AEMP will integrate considerations of water chemistry, hydrologic, and biological factors that combine to determine environmental effects, as required by a properly designed adaptive management program. For example, the identification of effluent water chemistry alone is not sufficient to determine downstream effects, since valued environmental components are affected by a variety of chemical, physical and biological characteristics which interact to influence species composition, abundance, and health. It is for this reason that Avalon is proposing to include annual sampling for lower trophic level organisms, which will serve as 'early warning' indicators of environment change.

As described in the DAR Section 6.4.2.6, modelling predicts that the MMER effluent criteria for all parameters will be met over the entire 20 year simulation period, in each of the lakes within the Thor Lake system. However, nutrient modelling identifies the possibility that seasonally increased primary and secondary production of the system may occur as a result of potential inputs of additional nitrogen from the TMF decant water. Nitrogen additions might not significantly affect lower trophic level community structure and composition due to the limitation of primary production by phosphorous. However, this potential effect must be carefully assessed and will therefore be a major focus of the biological and water quality monitoring program. Trends toward higher levels of nitrogen coupled with changes in phytoplankton species composition and abundance (through analysis of species richness, diversity, evenness, etc.) will result in the identification and implementation of additional mitigation to reduce nitrate levels in the TMF.

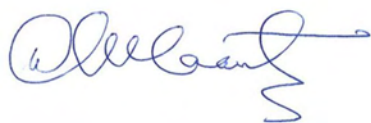
4.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

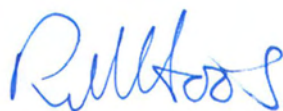
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APPENDIX A

APPENDIX A EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

Attachment 2

Hazardous Materials Spill Contingency Plan

Response Procedures for Site Personnel



Thor Lake Project

January 2012

Table of Contents

1.0	INTRODUCTION	1
1.1	Plan Purpose.....	1
1.2	Avalon Rare Metals Inc. Environmental & Safety Policy	2
2.0	SITE DESCRIPTION	3
2.1	General Site Description	3
	Nechalacho Mine and Flotation Plant.....	4
	Hydrometallurgical Plant	5
	Infrastructure Footprint	7
	Nechalacho Mine Site	7
	Hydrometallurgical Plant Site.....	7
2.2	Petroleum	8
2.3	Graywater Sewage.....	8
2.4	Reagents	9
2.5	Explosives	10
3.0	SPILL RESPONSE ORGANIZATION	10
3.1	On-Site Coordinator	10
3.2	Environmental Advisor	11
3.3	Site Employees	11
4.0	INITIAL SPILL RESPONSE	11
4.1	First Person at Site.....	11
4.2	On-Site Coordinator	12
5.0	SPILL RESPONSE CONTACTS	13
5.1	Internal Contacts	13
5.2	External Contacts	13
6.0	SPILL RESPONSE ACTION PLAN	14
6.1	Diesel Fuel, Hydraulic Oil and Lubricating Oil	14
6.2	Gasoline.....	14
6.3	Antifreeze	15
6.4	Propane.....	16
6.5	Flotation Reagents.....	16
6.6	Hydrometallurgical Plant Reagents.....	17
6.7	ANFO	18
7.0	SPILL RESPONSE EQUIPMENT	19
7.1	General Equipment.....	19
7.2	Spill Kits.....	19
8.0	DISPOSAL METHODS	20
9.0	SPILL RESPONSE TRAINING	20

1.0 INTRODUCTION

Plan Purpose

The purpose of the Spill Contingency Plan is to provide a strategic action plan for hazardous materials spills that may occur at the Thor Lake Project (TLP) site. The plan clearly defines the responsibilities of key personnel and outlines procedures to effectively and efficiently contain and recover hazardous materials spills. The plan is a working document which will be kept current by the EHS Coordinator during the projects construction and operations phases.

Petroleum products, reagents and hazardous materials considered in the TLP Spill Contingency Plan include but are not limited to:

PETROLEUM PRODUCTS, REAGENTS AND HAZARDOUS MATERIALS			
Products	Supplied As		Properties & Characteristics
	Conc. %	Form	
Diesel Fuel	100	Liquid	See MSDS in Appendix
Hydraulic Oil	100	Liquid	See MSDS in Appendix
Motor Oil	100	Liquid	See MSDS in Appendix
Gasoline	100	Liquid	See MSDS in Appendix
Antifreeze	100	Liquid	See MSDS in Appendix
Propane	100	Liquid	See MSDS in Appendix
ANFO	100	Liquid	See MSDS in Appendix
Greywater Sewage	100	Liquid	See MSDS in Appendix
Ferric Chloride (FeCl_3)	98	Solid	See MSDS in Appendix
Fluorosilicic Acid (H_2SiF_6)	24	Liquid	See MSDS in Appendix
Flocculant (Magnaflow 156)	100	Solid	See MSDS in Appendix
Sodium Hexametaphosphate (NaPO_3) ₆	98	Solid	See MSDS in Appendix
Sodium Hydroxide (NaOH)	99	Solid	See MSDS in Appendix
Sodium Silicate (Na_2SiO_3)	100	Solid	See MSDS in Appendix
Sodium Sulphide (Na_2S)	60	Solid	See MSDS in Appendix
Flotisor SM15 (1682)	100	Liquid	See MSDS in Appendix
Aero 845	100	Liquid	See MSDS in Appendix
Disponil SLS 101/103	30	Liquid	See MSDS in Appendix
Witcomul 3251	100	Liquid	See MSDS in Appendix
Acumer 9400	43	Liquid	See MSDS in Appendix
Rheosperse 3010	100	Liquid	See MSDS in Appendix
Alginic Acid ($\text{C}_6\text{H}_8\text{O}_6$)	22	Solid	See MSDS in Appendix

Oxalic Acid ($C_2O_2(OH)_2$)	99	Solid	See MSDS in Appendix
Citric Acid ($C_6H_8O_7$)	100	Solid	See MSDS in Appendix
Lactic Acid ($C_3H_6O_3$)	88	Liquid	See MSDS in Appendix
Limestone	95	Solid	See MSDS in Appendix
Lime	100	Liquid	See MSDS in Appendix
Elemental Sulphur (Used on site to produce acid and SO_2)	100	Solid	See MSDS in Appendix
H_2SO_4 (produced on site from sulphur)	100	Liquid	See MSDS in Appendix

Avalon Rare Metals Inc. Environmental & Safety Policy

Avalon Rare Metals Inc. (the 'Corporation') recognises that maintenance of environmental quality is vital to the Corporation's existence, progress, and continued development. The Corporation will maintain high environmental standards limited only by technical and economic feasibility. The Corporation will take positive action to protect the safety of its workers, conserve natural resources, and minimize the impact of its activities on the environment through diligent application of appropriate technology and responsible conduct at all stages of exploration, mine development, mining, mineral processing, decommissioning, and reclamation.

The purpose of Avalon Rare Metals Inc.'s Safety and Environmental Policy is to provide a measurable framework for the performance of the Corporation's activities in an environmentally responsible manner, ensuring compliance by the Corporation and its employees with all applicable environmental regulations and commitments.

Avalon Rare Metals Inc. will:

- Obey the law and conduct all business in an ethical manner;
- Evaluate, plan, construct, and operate all projects and facilities to reduce adverse environmental impacts and to meet or exceed applicable environmental laws, regulations, and standards. In the absence of applicable regulations, the Corporation will apply cost effective best management practices to protect the environment. Require managers of all projects and operations to adhere to the Corporation Environmental Policy and to identify, evaluate, and minimize risks to the environment;
- Continuously review environmental achievements and technology to seek and implement methods for further improvement;
- Require all operations to have site specific emergency response plans which meet or exceed all applicable regulations;
- Conduct regular environmental, health and safety preparedness and emergency response plans to verify compliance with the Corporation's policy and applicable regulations; Identify revisions or improvements to current practices in order to minimize environmental impacts. Report findings regularly to the Board of Directors;

- Educate employees in environmental matters and responsibilities relating to performance of their assigned tasks;
- Foster communication with shareholders, the public, employees, indigenous people and government to enhance understanding of environmental issues affecting the Corporation's activities;
- Work pro-actively with government and the public to define environmental priorities. Participate in the development of responsible laws for the protection of the environment; and
- Allocate sufficient resources to meet the Corporation's environmental goals. Annually assess the projected costs of decommissioning and reclamation of appropriate amount to ensure that there will be sufficient cash reserves to pay for these costs upon closure.

Avalon's health and safety policies were approved and adopted by the Board of Directors on the 18th day of July, 2006.

2.0 SITE DESCRIPTION

2.1 General Site Description

Avalon Rare Metals Inc. ('Avalon') is a publicly traded company engaged in the exploration and development of rare metal deposits in Canada. Avalon's 100% owned Thor Lake Property is located at Thor Lake in the Mackenzie Mining District of the Northwest Territories, about 5 km north of the Hearne Channel of Great Slave Lake and approximately 100 km southeast of the city of Yellowknife. Avalon proposes to mine, mill and produce rare earth carbonate and oxides, zirconium, niobium and tantalum oxides from the Nechalacho deposit, located on its Thor Lake Property. The proposed project is referred to as the Thor Lake Project (TLP).

Approximately 12-14 million tonnes of resources will be mined from the Nechalacho deposit over a period of approximately 20 years of operations. Construction will begin 16-18 months prior to operations, and reclamation activities will commence following cessation of all operations and continue for a period of approximately three years.

The proposed TLP has two site components: an underground mine and flotation plant (Nechalacho Mine and Flotation Plant site), to be located at the Thor Lake Property, and a hydrometallurgical plant (Hydrometallurgical Plant site) to be located at the existing brownfields site of the former Pine Point Mine, 85 km east of Hay River, NT on the south shore of Great Slave Lake.

Rare earth elements (REEs) will be mined underground and concentrated at the Nechalacho Mine and Flotation Plant site. The resulting REE concentrates will be barged across the east end of Great Slave Lake to the Hydrometallurgical Plant site. Upon arrival, the concentrate will be transported from the south shore of Great Slave Lake to the Hydrometallurgical Plant site via a haul road. The concentrate will be further

processed at the Hydrometallurgical Plant. The resulting final products will be hauled to the Hay River railhead via truck, and direct shipped for further separation.

Nechalacho Mine and Flotation Plant

The Nechalacho Deposit will be mined underground. A decline ramp (15% ramp grade) will be utilized to access the ore zone located at approximately 200 m depth. Production is planned for 2000 tpd during the life of the Project. Mining will be conducted with a first pass of primary stopes, followed by pillar extraction after the primary stopes have been filled. Rubber-tired mechanized equipment will be utilized to provide maximum flexibility. Primary crushing will be completed underground and crushed ore and waste rock will be conveyed to the surface.

Flotation Plant: The process to produce the REE concentrate will involve conventional grinding, crushing and flotation techniques. Processing facilities will include a Flotation Plant that will produce a high grade concentrate that will be barged off-site to the proposed Hydrometallurgical Plant site for secondary processing.

Water Supply: The proposed fresh and process water supply source is Thor Lake.

Tailings Management Facility: The tailings management facility will be located up slope from the Flotation Plant and northeast of Thor Lake in the local catchment of Ring and Buck lakes. The tailings will be discharged to a number of locations around the tailings management facility to develop a relatively flat tailings beach and centralized supernatant pond to maximize tailings storage efficiency. Construction of the tailings management facility will occur in two phases over a period of three years.

Camp: A 150 person camp to house the employees and staff will be constructed adjacent to the Flotation Plant and in close proximity to the airstrip.

Power Supply: All site power is currently planned to be generated by a diesel powered generation facility at the site. The power requirements will range from 7.4 MW to 8.4 MW for the 2000 tpd operation. Standby diesel generators will be installed as a secondary power source. Wind, Biomass and geothermal power are also being investigated as supplementary power sources for the Thor Lake Mine and Flotation Plant site; however, these initiatives will not be included in the Project development for the current Environmental Assessment. Should these clean energy initiatives prove advantageous for the future Project, Avalon anticipates a separate permitting process for any clean technology initiatives.

Concentrate Storage and Loading: Approximately 360 tonnes per day (tpd) of concentrate will be produced from the Flotation Plant for the anticipated duration of production. The concentrate will be loaded directly from the Flotation Plant into half-height intermodal containers. Once loaded, the containers will be removed from the Flotation Plant and transported to the seasonal barge loading area either for shipment to

the Hydrometallurgical Plant or for winter storage in a designated stacking area to be located near the barging facility.

Access Road: The existing 5 km access road that extends from the proposed Nechalacho Mine and Flotation Plant site to the current barge landing site will be upgraded for the safe transport of concentrate and supplies.

Airstrip: The current 300 metre airstrip is located northwest of the proposed Flotation Plant and west of Thor Lake. The airstrip will be upgraded and extended 700 m to a total length of approximately 1000 m. The upgraded airstrip will accommodate Dash 8 and Buffalo aircraft and facilitate the safe transport of employees and supplies.

Fuel Storage: Diesel fuel will be transported from the south side of Great Slave Lake to the barge dock at the Nechalacho Mine and Flotation Plant site. Upon arrival, fuel will be offloaded to an upland receiving fuel storage facility to be located adjacent to the dock at Great Slave Lake. It will then be transferred by tanker truck to the main storage facility to be located west of the Flotation Plant near the diesel power plant.

Dock Facility: A seasonal dock facility comprised of a single barge connected to shore for the open water period and an adjacent yard will be used for concentrate storage and shipment to the Hydrometallurgical Plant site. It will also be used to receive and handle the annual resupply of major Mine consumables including fuel.

Hydrometallurgical Plant

The proposed Hydrometallurgical Plant will further process the REE concentrates from the Nechalacho Mine and Flotation Plant. The process will include acid baking, water washing, filtration, solvent extraction and product drying facilities to produce direct ship products.

Water Supply: Potable and process water will be obtained from an existing nearby open pit lake and treated on-site as necessary for its intended uses.

Hydrometallurgical Tailings Facility: The proposed hydrometallurgical tailings facility (HTF) will be located within an historic open pit (L-37 pit) located south-southwest of the proposed Hydrometallurgical Plant location, near the historic town of Pine Point. The proposed site is located approximately 85 km east of Hay River and 5 km north of the former town of Pine Point. Excess supernatant water from the HTF will be pumped to another historic open pit (N-42 pit), located to the southwest, for discharge and infiltration into the Presqu'île aquifer. Any water decanted from the hydrometallurgical tailings facility will be discharged in compliance with MVLWB Water License discharge criteria.

Concentrate Storage and Loading: Upon arrival at the Hydrometallurgical Plant, the concentrate storage containers will be unloaded from the trucks and placed into a secure storage area. As required, the containers will be moved into a heated thaw shed. Once in the thaw shed, the concentrate will be removed from the containers. The containers will be cleaned prior to shipment back to the Nechalacho Mine.

Power Supply: Average power consumption for the Hydrometallurgical Plant during start-up and steady state operations is expected to be between 3.5 to 4.0 MW. This power will be provided through the existing Northwest Territories Power Corporation (NTPC) power grid and substation located at the former Pine Point Mine site. Secondary and backup supply of power will be provided by diesel powered generating units on-site. Wind and geothermal power are also being investigated as supplementary power sources for the Hydrometallurgical Plant site however, are not included in the Projects permitting process at this time.

Limestone Storage: The limestone used to neutralize the Hydrometallurgical Plant's waste stream prior to discharge to the tailings management facility will be obtained from local supply sources and stockpiled in a designated area that is in close proximity to the Hydrometallurgical Plant. Because the limestone is a neutralizing product, no special stockpile considerations will be necessary.

Haul Road: An existing access road remaining from historical mine activities will be upgraded to safely transport the concentrate offloaded from barges on the south shore of Great Slave Lake to the Hydrometallurgical Plant located at the former Pine Point Mine site. The haul road will be approximately 8.6 km long. It will be aligned directly north-south along an existing drainage ditch for approximately 4.9 km prior to connecting to an existing haul road from a former mine pit located north of the main hydrometallurgical plant site area.

Dock Facility: A seasonal dock facility consisting of two barges connected together to create a temporary floating dock and a marshalling yard will be installed on the south shore of Great Slave Lake approximately 8.6 km from the Hydrometallurgical Plant. The seasonal dock facility will permit the berthing and offloading of Thor Lake REE concentrates onto flatbed trucks for transportation to the Hydrometallurgical Plant. This facility will also be used for the annual shipment of major mining consumables, including fuel, to the Nechalacho Mine site.

Product Transportation to Railhead: The Hydrometallurgical Plant will produce approximately 418 tpd of moist concentrate and light rare earth products. The moist acid baked residue makes up 330 tpd while the moist light rare earth filter cake is 88 tpd. Both concentrate and light rare earth products will be blow dried during filtration to minimize moisture content and prepare the products for shipment to Avalon's separation plant. The final products will be packaged and hauled 85 km from the Hydrometallurgical Plant to the Hay River railhead. The final products will be direct-shipped from the railhead to further downstream separation.

The following pages show the site layout for the Nechalacho Mine and Flotation Plant and the Hydrometallurgical Plant.

Infrastructure Footprint

Nechalacho Mine Site

The primary effects of the Nechalacho Mine Site on surficial geology (terrain) and soils will be largely associated with infrastructure development. During the construction phase in particular, soils and terrain will be disturbed as areas are prepared to support infrastructure. The total amount of direct disturbance anticipated at the Nechalacho Mine Site is approximately 164 ha, of which the majority (109 ha or 66%) is attributable to the Tailings Management Facility (TMF).

NECHALACHO MINE SITE FOOTPRINT		
Footprint Component	Area (ha)	Proportion of Footprint (%)
Tailings Management Facility	109.1	66.4
Roads	21.0	12.8
Flotation Plant and Miscellaneous Infrastructure	17.5	10.7
Polishing Pond	12.5	7.6
Airstrip	2.7	1.7
Pipelines and Pumps	0.8	0.5
Seasonal Dock Facility	0.7	0.4
Total	164.4	100.0

Hydrometallurgical Plant Site

At the Hydrometallurgical Plant Site, the footprint covers approximately 62 ha and is situated almost completely (i.e., 92%) on previously disturbed ground. This was an important consideration in the siting of the Hydrometallurgical Plant and associated infrastructure as this strategy will ensure that no residual effects to terrain and soils will occur in this area.

HYDROMETALLURGICAL PLANT SITE FOOTPRINT		
Footprint Component	Area (ha)	Proportion of Footprint (%)
Roads	32.4	51.9
L37 Pit	23.4	37.6
Hydrometallurgical Plant	5.0	8.1
Seasonal Dock Facility	1.5	2.5
Total	62.3	100

2.2 Petroleum

All fuel and lubricants will be stored on site in approved storage tanks and containers in an engineered and lined surface fuel and lube cache capable of holding 110% of the capacity of the largest tank in accordance with CCME criteria (See Figures above). The areas designated for fuel and lube cache will be located adjacent to the flotation plant and near the Thor Lake barge dock facility for ease of access.

The fuel and lube caches will contain:

- (4) 4.5 million liter diesel fuel tanks (Flotation Plant)
- (2) 1.5 million liter diesel fuel tanks (Barge area)
- (~2) 40,000 liter hydraulic (or multipurpose) oil
- (~12) 2,000 liter totes for transmission oils
- (8) pallets of five gallon buckets of specialty oils (yet to be determined)
- (10) pallets of five gallon buckets of multipurpose grease

Outside the fuel and lube cache, the Thor Lake generator system will be directly connected to the diesel fuel tanks. Additionally, there will be a small generator for a shack located near the barge loading facility which will be fuelled from a 200 litre drum.

Fuel and lubricants will be supplied via tanker truck from the barge loading area to the main fuel depot located near the flotation plant. Fuel and hydraulic oil will be transported underground via 5 cm (2") HDPE line for daily underground use and will be drained after each transfer. Lubricants will be sent underground via bulk totes. Appropriate spill response equipment will be stored at the fuel and lube cache. The *Federal Storage Tank Systems for Petroleum Products and Allied petroleum Products Regulations*, under the *Canadian Environmental Protection Act* (CEPA 1999) has been considered and will be adhered to in this plan.

2.3 Graywater Sewage

Avalon will install and utilize a self-contained, packaged, Rotating Biological Contactor (RBC) sewage treatment plant for both the Nechalacho Mine and Hydrometallurgical sites. The plant is readily transportable and will be contained in a 3 x 6 meter (10 ft x 20 ft) structure. The treated effluent will be suitable for discharge to the receiving environment and will be co-mingled with the discharge line reporting to the tailings management facilities.

2.4 Reagents

The reagents employed in the flotation circuits will be stored and used in the process facility. The below Tables lists the reagent quantities required at both the Nechalacho Mine and Hydrometallurgical Plant.

The reagents used in the flotation circuits will be adsorbed onto the mineral surfaces either to enhance specific mineral floatability or to prevent their floatability. Consequently, most of the reagents will leave the flotation plant on the surface of the concentrates produced or on the surface of the discharge solids reject which will be returned to the tailings management facility and after year five, underground as cemented pastefill.

No special handling is required for any of the reagents used in the process. The flotation operators will receive personnel training that will detail how to prevent excess quantities of all reagents from entering the process.

Reagents will be delivered to the TLP site in bulk, tote bags (1 tonne) and steel or plastic drums. Deliveries will be scheduled on an annual basis depending on the availability of product.

NECHALACHO MINE FLOTATION PLANT REAGENTS	
Reagent	Life of Mine
	Tonnes/Year
Ferric Chloride (FeCl_3)	139.6
Fluorosilicic Acid (H_2SiF_6)	760
Flocculant (Magnafloc 156)	11.34
Sodium Hexametaphosphate (NaPO_3) ₆	121
Sodium Hydroxide (NaOH)	129
Sodium Silicate (Na_2SiO_3)	118.6
Sodium Sulphide (Na_2S)	912
Flotisor SM15 (1682)	256
Aero 845	152.8
Disponil SLS 101/103	346
Witcomul 3251	97.8
Acumer 9400	216
Rheosperse 3010	92.8
Alginate Acid ($\text{C}_6\text{H}_8\text{O}_6$)	192.8
Oxalic Acid ($\text{C}_2\text{O}_2(\text{OH})_2$)	188
Citric Acid ($\text{C}_6\text{H}_8\text{O}_7$)	186.2
Lactic Acid ($\text{C}_3\text{H}_6\text{O}_3$)	105.8

HYDROMETALLURGICAL PLANT: AVERAGE REAGENT CONSUMPTION	
Reagent	Life of Mine
	Tonnes/Year
Limestone	27,000
Lime	3,500
Elemental Sulphur (Used on site to produce acid and SO ₂)	30,000
H ₂ SO ₄ (produced on site from sulphur)	79,000
Flocculant	2.5
Sodium Sulphate	13,000

2.5 Explosives

Temporary powder and cap magazines will be located on the surface during the TLP's construction. The magazines will be located approximately 300 metres south of the TLP facilities. Approximately 7,000 kg of explosives will be stored in the explosives magazine and 12,000 caps will be stored in the detonator magazine at any given time. Both magazines will meet the NWT Mine Health and Safety Act and Regulations. The magazines will be bermed on three sides, locked and secured.

3.0 SPILL RESPONSE ORGANIZATION

In the event of a hazardous materials spill on the site, all personnel will follow a defined response and notification procedure led by the On-Site Coordinator and supported by the Environmental Advisor (EBA) and site employees. This group will form the TLP Spill Response Team and will be responsible for specific tasks during a hazardous materials spill. The Spill Response Team will also be responsible for ensuring that all hazardous materials on the surface and underground are stored properly. This team will follow the NWT Mine Health and Safety Act and Regulations, section 9.08, Storage of Hazardous Materials.

3.1 On-Site Coordinator

The On-Site Coordinator will have the following responsibilities:

- Assume complete authority over the spill area and coordinate the actions of site personnel.
- Evaluate the spill and develop an overall response plan.
- Mobilize personnel and equipment to the site of the spill.

- Report the spill immediately to the Northwest Territory (NWT) Spill Line and Environmental Advisor.
- Obtain additional manpower, equipment and materials if they are not available on-site.
- Provide regulatory agencies and Avalon Rare Metals Inc. with information regarding the status of clean-up activities.
- Prepare and submit a report on the spill incident to regulatory agencies within 30 days of the event.

3.2 Environmental Advisor

The Environmental Advisor will have the following responsibilities:

- Provide technical advice regarding probable environmental effects from the spill.
- Provide advice to the On-Site Coordinator for spill response procedures.
- Assist in developing any sampling, testing or monitoring of soil or water directly affected by the spill.

3.3 Site Employees

The TLP will employ an estimated 280 total personnel during operations. Approximately 80 of the personnel will work on the surface. These employees will be available to assist and mitigate spill response situations. Spill Response training for surface employees is discussed in Section 9.0.

4.0 INITIAL SPILL RESPONSE

Specific actions and communications are in place to ensure an expedient response to a hazardous materials spill (Figure 4.0-1). Initial Spill Response measures include the following steps:

4.1 First Person at Site

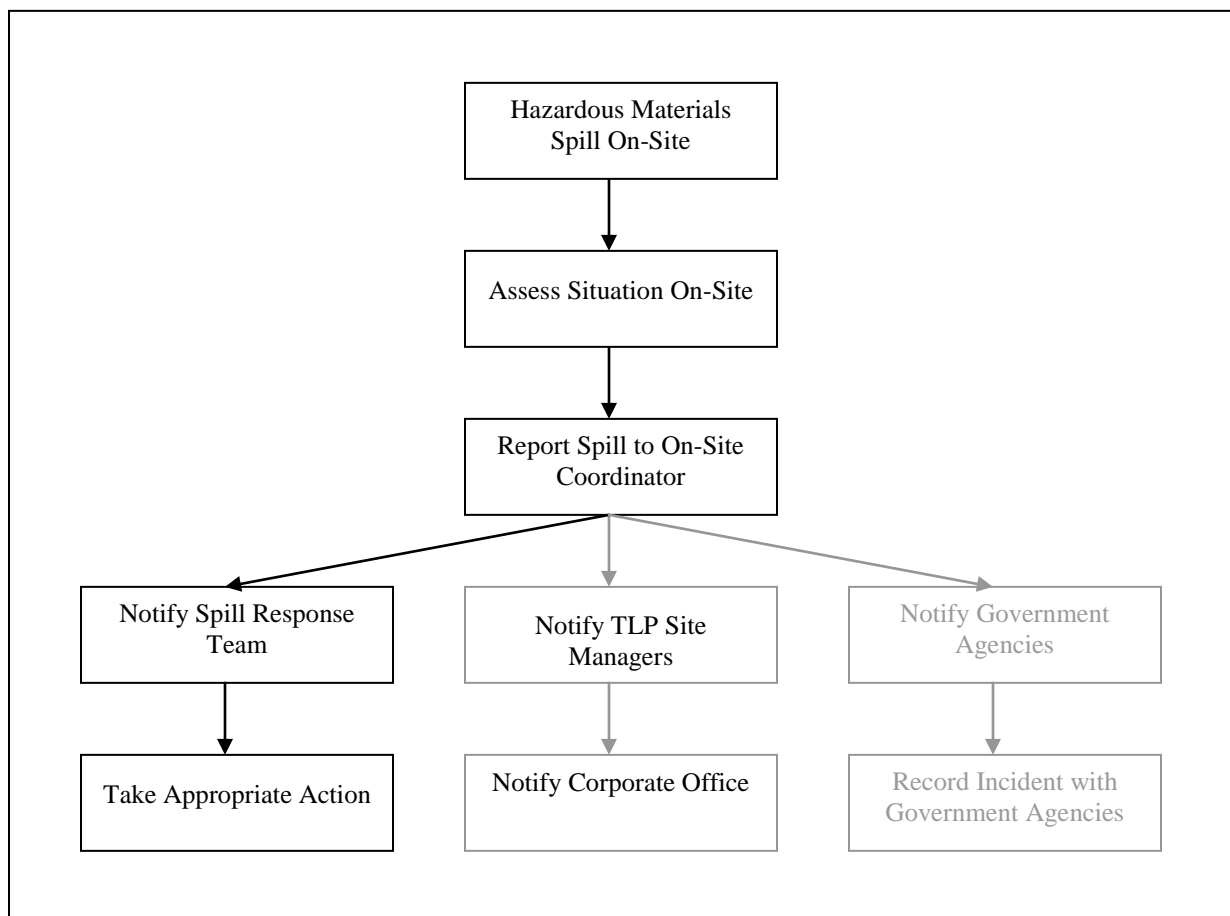
- Consider personal safety first and put on appropriate personal protective equipment
- Identify the material that has been spilled.
- Assess any potential hazard to people in the vicinity of the spill.
- Control the danger to human life if it is possible to do so without additional assistance.
- Assess if the spill can be stopped or brought under control.
- Stop the flow of material if it can be done safely.

- Immediately report the spill to the On-Site Coordinator.
- Call the 24 hr NWT Spill Line ((867) 920-8130) **IF** the On-Site Coordinator cannot be contacted.
- Resume effective action to contain, mitigate, or terminate the flow of spilled material.

4.2 On-Site Coordinator

- Call the NWT 24 hr Spill Line at (867) 920-8130 as soon as possible to report the spill and provide initial incident details.
- Complete and fax a NWT Spill Report Form to (867) 873-6924.
- Gather relevant information and submit a detailed spill report to the applicable regulatory agencies no later than 30 days after the spill event.

Figure 4.0-1 TLP Response and Notification Process



5.0 SPILL RESPONSE CONTACTS

5.1 Internal Contacts

On-Site Coordinator	TBD	office: TBD cell: TBD
Environmental Advisor (EBA)	Rick Hoos	office: (604) 685-0275 cell: (604) 813-4952
Office Manager	TBD	office: TBD cell: TBD
V.P. Exploration	Bill Mercer	office: (416) 364-4938 cell: (647) 282-4069
V.P. Operations	David Swisher	office: (604) 940-3800 cell: (604) 347-9620
President and CEO	Donald S. Bubar	office: (416) 364-4938 cell: (416) 723-9132

5.2 External Contacts

Additional assistance may be obtained as necessary from the following organizations:

Emergency Services

Ambulance	(867) 874-9333
Fire	(867) 874-2222
Police	(867) 874-1111
Medical Emergency	(867) 874-7100
Poison Control	(867) 874-7100
Oil and Chemical Spills	(867) 920-8130

Charter Companies

Great Slave Helicopters	(867) 873-2081
Deton Cho Logistics	(867) 873-6970
Discovery Mining Services	(867) 920-4600

Government

WCB Mine Accident Reporting Line	1-800-661-0792
EC Reporting Line	(867) 766-3737
INAC Contaminants	(867) 669-2756
INAC Contaminants Hot Line	1-800-661-0827
INAC Hay River Sub-District Office	(867) 874-6994

6.0 SPILL RESPONSE ACTION PLAN

Only trained personnel will participate in containment and clean-up activities. All non-trained personnel will be required to immediately report any spills to his/her supervisor.

6.1 Diesel Fuel, Hydraulic Oil and Lubricating Oil

- Used for all mobile equipment and generators on the surface and underground.
- Stop the spill flow if it is possible and safety permits.
- No smoking is permitted when responding to a diesel fuel, hydraulic oil or lubricating oil spill.

On Land

- Do not flush into ditches or drainage systems.
- Build barrier with soil to block entry into waterways.
- Remove the spill by using sorbent pads or digging out the soil.

On Water

- Use a containment boom to concentrate the spill for recovery.
- Use sorbent pads to remove small spills.
- Use a skimmer to remove larger spills.

On Ice and Snow

- Block entry into waterways by building a barrier with snow to contain the spill.
- Remove the spill using sorbent pads and shovel contaminated ice and snow into plastic buckets with lids and/or polypropylene bags.

Storage and Transfer

- Store all contaminated water, snow/ice, soils, clean-up supplies, and absorbent materials in closed, labeled containers.
- Store containers in ventilated areas away from incompatible materials.

Disposal

- Consult with Federal and Territorial Environmental Authorities before disposing contaminated material.
- See Section 9.0

6.2 Gasoline

- Used minimally for light-duty company vehicles.
- Stop the spill flow if it is possible and safety permits.
- Eliminate ignition sources. Gasoline forms vapors that can ignite and explode.

- No smoking is permitted when responding to a gasoline spill.

On Land

- Build barrier with soil to block entry into waterways.
- Do not attempt to contain the spill if ignition potential exists.
- Use particulate sorbent material to soak up the spill.

On Water

- Contain and remove spills only after vapors have dissipated.
- Use containment booms to concentrate spills.
- Use a skimmer on a contained slick.

On Ice and Snow

- Block entry into waterways by building a barrier with snow to contain the spill.
- Remove the spill by using particulate sorbent and shovel contaminated ice and snow into plastic buckets with lids and/or polypropylene bags.

Storage and Transfer

- Store all contaminated water, snow/ice, soils, clean-up supplies, and absorbent materials in closed, labeled containers.
- Store containers in ventilated areas away from incompatible materials.
- Electrically ground all containers and transporting equipment.

Disposal

- Consult with Federal and Territorial Environmental Authorities before disposing contaminated material.
- See Section 8.0

6.3 Antifreeze

- Used in all mobile equipment and generators.
- Stop the spill flow if it is possible and safety permits.

On Land

- Do not flush into ditches or drainage systems.
- Build barrier with soil to block entry into waterways.
- Remove spill using sorbent pads or digging out soil.

On Water

- Be aware that antifreeze sinks and mixes with water.
- Confine and isolate the spill by damming or diverting the spill.
- Pump contaminated water into containers.

On Ice and Snow

- Block entry into waterways by building a barrier with snow to contain the spill.
- Remove the spill by using particulate sorbent and shovel contaminated ice and snow into plastic buckets with lids and/or polypropylene bags.

Storage and Transfer

- Store all contaminated water, snow/ice, soils, clean-up supplies, and absorbent materials in closed, labeled containers.
- Store containers in ventilated areas away from incompatible materials.

Disposal

- Consult with Federal and Territorial Environmental Authorities before disposing contaminated material.
- See Section 8.0

6.4 Propane

- Used for the underground heater located on the surface near main shaft.
- Stop the spill flow if it is possible and safety permits. Eliminate ignition sources. No smoking is permitted when responding to a propane spill.

On Land

- Do not attempt to contain or remove the spill.

On Ice and Snow

- Do not attempt to contain or remove the spill.

Storage and Transfer

- It is not possible to collect and/or contain propane once it is released.

Disposal

- No disposal is required.

6.5 Flotation Reagents

- Used in the flotation process and stored, handled and mixed inside the process facility building.
- Stop the spill flow if it is possible and safety permits.
- Keep away from all heat or ignition sources.....smoking is prohibited around all reagents.

On Land

- Do not flush into ditches or drainage systems.
- Build barrier with soil to block entry into waterways.
- Remove spill using sorbent pads or digging out soil.
- For small spills, dilute with water, mop up and absorb with inert dry material.

On Water

- Be aware that reagents sink and mix with water.
- Confine and isolate the spill by damming or diverting the spill.
- Pump contaminated water into containers.

On Ice and Snow

- Block entry into waterways by building a barrier with snow to contain the spill.
- Remove the spill by using particulate sorbent and shovel contaminated ice and snow into plastic buckets with lids and/or polypropylene bags.

Storage and Transfer

- Store all contaminated water, snow/ice, soils, clean-up supplies, and absorbent materials in closed, labeled containers.
- Store containers in ventilated areas away from incompatible materials.

Disposal

- Consult with Federal and Territorial Environmental Authorities before disposing contaminated material.
- See Section 8.0

6.6 Hydrometallurgical Plant Reagents

- Used in the flotation process and stored, handled and mixed inside the process facility building.
- Stop the spill flow if it is possible and safety permits.
- Keep away from all heat or ignition sources.....smoking is prohibited around all reagents.

On Land

- Do not flush into ditches or drainage systems.
- Build barrier with soil to block entry into waterways.
- Remove spill using sorbent pads or digging out soil.
- For small spills, dilute with water, mop up and absorb with inert dry material.

On Water

- Be aware that reagents sink and mix with water.
- Confine and isolate the spill by damming or diverting the spill.

- Pump contaminated water into containers.

On Ice and Snow

- Block entry into waterways by building a barrier with snow to contain the spill.
- Remove the spill by using particulate sorbent and shovel contaminated ice and snow into plastic buckets with lids and/or polypropylene bags.

Storage and Transfer

- Store all contaminated water, snow/ice, soils, clean-up supplies, and absorbent materials in closed, labeled containers.
- Store containers in ventilated areas away from incompatible materials.

Disposal

- Consult with Federal and Territorial Environmental Authorities before disposing contaminated material.
- See Section 8.0

6.7 ANFO

- Used for blasting activities during construction and development.
- Use non-sparking tools during clean-up procedures. Stop the spill flow if it is possible and safety permits. Protect from all ignition sources. Protect from all impacts. In case of fire, evacuate area not less than 2,500 feet in all directions.

On Land

- Do not flush into ditches or drainage systems.
- Build barrier with soil to block entry into waterways.
- Handle spills using non-sparking tools.
- If uncontaminated, repackage product in original packaging or clean approved container.

On Water

- Nitrate salts are completely soluble, but emulsion dissolution is very slow.
- Confine and isolate the spill by damming or diverting the spill.
- Collect contaminated water into containers.

On Ice and Snow

- Block entry into waterways by building a barrier with snow to contain the spill.
- Remove the spill and snow into plastic buckets with lids and/or polypropylene bags.

Storage and Transfer

- Store all contaminated water, snow/ice, soils, clean-up supplies, and absorbent materials in closed, labeled containers.
- Store containers in cool and ventilated areas away from incompatible materials.

Disposal

- Consult with Federal and Territorial Environmental Authorities before disposing contaminated material.
- Consult with Manufacturer.
- See Section 8.0

7.0 SPILL RESPONSE EQUIPMENT**7.1 General Equipment**

Hand tools will be kept on site to aid in the mitigation of hazardous materials spills. A rubber tire loader will also be available for emergency use and to respond to spill incidents.

7.2 Spill Kits

Avalon Rare Metals Inc. will maintain spill kits on-site. Spill kits will be located in the Maintenance Shop, Warehouse, Freeze Plant, Process Building and the Fuel and Lube Storage Area. The spill kit locations are illustrated in Figure 2.1-1. Spill kit inventories will contain the following items:

- (1) 16 Gauge Open-Top Drum with Bolting Ring and Gasket (205 litre)
- (1) Pkg. of 10 Disposable Polyethylene Bags (5 mil)
- (1) Shovel (spark proof)
- (4) 5" x 10' Absorbent Booms
- (1) 10 lb. Bag of Absorbent Particulate
- (1) Bail of 17' x 19' x d = Sorbent Sheets (100 sheets)
- (2) PVC Oil Resistant Gloves
- (2) Respirators
- (2) Pairs Splash Protective Goggles

8.0 DISPOSAL METHODS

In the event of a spill, the On-Site Coordinator will seek government approval and advice for proper disposal. The selected disposal method will require approval from the Environmental, Health and Safety Coordinator or Site Manager. The following disposal options are considered appropriate and are expected to meet government approval.

- Off-Site Disposal (to a landfill that permits disposal of hazardous materials)
- Controlled Burning (contaminants)
- Incineration (liquid product)
- Manufacturer retrieval

9.0 SPILL RESPONSE TRAINING

The On-Site Coordinator will conduct training for all surface personnel working on the TLP. Surface personnel will be trained in the techniques and materials required to manage hazardous spill responses. Training will include the following instruction:

- The initial spill response procedure to use in the event of a spill.
- Location and use of emergency equipment to respond to spills.
- Safe operation of equipment and tools to minimize the potential for spills.
- Operational procedures to limit the potential and impact of spills.
- Monthly safety discussions to address work hazards.

MATERIAL SAFETY DATA SHEET

SECTION 1

PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: CAT ARCTIC DEO SYN 0W-30
Product Description: Synthetic Base Stocks and Additives
MSDS Number: 18230
Intended Use: Engine oil

COMPANY IDENTIFICATION

Supplier: Imperial Oil Products Division
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada
24 Hour Environmental / Health Emergency 519-339-2145
Telephone
Transportation Emergency Phone Number 519-339-2145
Product Technical Information 1-800-268-3183
Supplier General Contact 1-800-567-3776

SECTION 2

COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3

HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4

FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Eye Contact

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: 230C (446F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

Notification Procedures

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Avoid contact with used product. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to

be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
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Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid

Colour: Amber

Odour: Characteristic

Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.85

Flash Point [Method]: 230C (446F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

Boiling Point / Range: N/D

Vapour Density (Air = 1): N/D

VAPOUR PRESSURE: [N/D at 20 °C] | < 1 kPa (7.5 mm Hg) at 38C

Evaporation Rate (N-Butyl Acetate = 1): < 1

pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): > 3.5

Solubility in Water: Negligible
Viscosity: [N/D at 40°C] | 11.3 cSt (11.3 mm²/sec) at 100C
Oxidizing properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -45°C (-49°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Route of Exposure	Conclusion / Remarks
INHALATION	
Toxicity (Rat): LC50 > 5000 mg/m ³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Diesel engine oils: Not carcinogenic in animals tests. Used and unused diesel engine oils did not produce any carcinogenic effects in chronic mouse skin painting studies. Oils that are used in gasoline engines may become hazardous and display the following properties: Carcinogenic in animal tests. Caused mutations in vitro. Possible allergen and photoallergen. Contains polycyclic aromatic compounds (PAC) from combustion products of gasoline and/or thermal degradation products.

Contains:

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitising in test animals and humans.

Additional information is available by request.

CMR Status: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A

3 = IARC 2B
4 = ACGIH ALL

5 = ACGIH A1
6 = ACGIH A2

SECTION 12**ECOLOGICAL INFORMATION**

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

SECTION 13**DISPOSAL CONSIDERATIONS**

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Regulatory Disposal Information

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14**TRANSPORT INFORMATION**

LAND (TDG) : Not Regulated for Land Transport

LAND (DOT) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

National Chemical Inventory Listing: AICS, IECSC, DSL, ELINCS, ENCS, KECI, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ZINC DITHIOPHOSPHATE	68649-42-3	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4

3 = TSCA 5e

5 = TSCA 12b

2 = TSCA 5a2

4 = TSCA 6

6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 04: First Aid Skin - Header was modified.

Section 13: Disposal Considerations - Disposal Recommendations was modified.

Section 10: Materials To Avoid - Header was modified.

Section 15: National Chemical Inventory Listing was modified.

Section 16: MSN,MAT ID was modified.

Section 01: Product Identification Product Name was modified.

Section 15: List Citation Table - Header was modified.

Section 15: Canadian List Citations Table was added.

Section 15: Chemical Name - Header was added.
Section 15: CAS Number - Header was added.
Section 15: List Citations -Header was added.

WHMIS Classification: Not controlled

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DGN: 5016853 (1009344)

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Prepared By: Imperial Oil Limited, IH and Product Safety

Material Safety Data Sheet



SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Cat® ELC₂ (Extended Life Coolant) Premix 50/50

Product Use: Antifreeze/Coolant

Product Number(s): 16334, CPS236334

Company Identification

Chevron Lubricants Canada Inc.

Lubricants Chevron Canada

6975-A Pacific Circle

Mississauga, ONT L5T 2H3

Canada

www.chevronlubricants.com

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

email : lubemsds@chevron.com

Product Information: (800) LUBE TEK

MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Ethylene Glycol	107-21-1	40 - 50 %weight
Diethylene glycol	111-46-6	1 - 5 %weight
Sodium 2-ethylhexanoate	19766-89-3	1 - 5 %weight

Information on ingredients that are considered Controlled Products and/or that appear on the WHMIS Ingredient Disclosure List (IDL) is provided as required by the Canadian Hazardous Products Act (HPA, Sections 13 and 14). Ingredients considered hazardous under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, are also listed. See Section 15 for additional regulatory information.

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- HARMFUL OR FATAL IF SWALLOWED
- MAY CAUSE DIZZINESS, DROWSINESS AND REDUCED ALERTNESS
- CONTAINS MATERIAL THAT MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS BASED ON

ANIMAL DATA

- POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL THAT MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA
- CAUSES DAMAGE TO:
- KIDNEY

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Toxic; may be harmful or fatal if swallowed.

Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: Contains material that may cause adverse reproductive effects if swallowed based on animal data. Contains material that may cause birth defects based on animal data.

Target Organs: Contains material that causes damage to the following organ(s) if swallowed: Kidney
See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue. Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.

SECTION 5 FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

Flashpoint: Not Applicable

Autoignition: No Data Available

Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Dry Chemical, CO₂, AFFF Foam or alcohol resistant foam.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will not burn.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling.

General Handling Information: Do not taste or swallow antifreeze or solution. Keep out of the reach of children and animals.

General Storage Information: Do not store in open or unlabeled containers.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Natural rubber, Neoprene, Nitrile Rubber, Polyvinyl Chloride (PVC or Vinyl).

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying

Respirator for Organic Vapors, Dusts and Mists.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Country/ Agency	TWA	STEL	Ceiling	Notation
Ethylene Glycol	ACGIH	--	--	100 mg/m3	--

NOTE ON OCCUPATIONAL EXPOSURE LIMITS: Consult local authorities for acceptable provincial values in Canada. Consult the Canadian Standards Association Standard 94.4-2002 Selection, Use and Care of Respirators.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Red

Physical State: Liquid

Odor: Faint or Mild

pH: 8.1 - 8.5

Vapor Pressure: No data available

Vapor Density (Air = 1): 2.1

Boiling Point: 108.9°C (228°F)

Solubility: Miscible

Freezing Point: -36.7°C (-34°F)

Melting Point: No Data Available

Specific Gravity: 1 - 1.5 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

Viscosity: No data available

Odor Threshold: No Data Available

Coefficient of Water/Oil Distribution: No Data Available

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Hazardous Decomposition Products: Aldehydes (Elevated temperatures), Ketones (Elevated temperatures)

Hazardous Polymerization: Hazardous polymerization will not occur.

Sensitivity to Mechanical Impact: No.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components. No product toxicology data available.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: LDLo-Lowest Lethal Dose: 1.56 g/kg (human) The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components. For additional information on the acute toxicity of the components, call the technical information center.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains diethylene glycol (DEG). The estimated oral lethal dose is about 50 cc (1.6 oz) for an adult human. DEG has caused the following effects in laboratory animals: liver abnormalities, kidney damage and blood abnormalities. It has been suggested as a cause of the following effects in humans: liver abnormalities, kidney damage, lung damage and central nervous system damage.

This product contains ethylene glycol (EG). The toxicity of EG via inhalation or skin contact is expected to be slight at room temperature. The estimated oral lethal dose is about 100 cc (3.3 oz.) for an adult human. Ethylene glycol is oxidized to oxalic acid which results in the deposition of calcium oxalate crystals mainly in the brain and kidneys. Early signs and symptoms of EG poisoning may resemble those of alcohol intoxication. Later, the victim may experience nausea, vomiting, weakness, abdominal and muscle pain, difficulty in breathing and decreased urine output. When EG was heated above the boiling point of water, vapors formed which reportedly caused unconsciousness, increased lymphocyte count, and a rapid, jerky movement of the eyes in persons chronically exposed. When EG was administered orally to pregnant rats and mice, there was an increase in fetal deaths and birth defects. Some of these effects occurred at doses that had no toxic effects on the mothers. We are not aware of any reports that EG causes reproductive toxicity in human beings.

2-Ethylhexanoic acid (2-EXA) caused an increase in liver size and enzyme levels when repeatedly administered to rats via the diet. When administered to pregnant rats by gavage or in drinking water, 2-EXA caused teratogenicity (birth defects) and delayed postnatal development of the pups. Additionally, 2-EXA impaired female fertility in rats. Birth defects were seen in the offspring of mice who were administered sodium 2-ethylhexanoate via intraperitoneal injection during pregnancy.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

ENVIRONMENTAL FATE

Ready Biodegradability: This material is expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods. (See B.C. Reg. GY/92 Waste Management Act; R.R.O. 1990, Reg. 347 General-Waste Management; C.C.S.M.c. W40 The Waste Reduction and Prevention Act; N.S. Reg. 51/95 and N.S. Reg. 179/96 for examples of Provincial legislation.)

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate

Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

TC Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER TDG REGULATIONS

IMO/IMDG Shipping Description: MAY BE REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: Anti-freeze Preparations, Proprietary; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

DOT Shipping Description: Anti-freeze Preparations, Proprietary

Additional Information: Bulk shipments with a reportable quantity (5000 pounds) of ethylene glycol are a hazardous material. The Proper Shipping Name is: Environmentally Hazardous Substance, Liquid, N.O.S. (ethylene glycol), 9, UN3082, III, RQ (ethylene glycol).

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
35=WHMIS IDL

The following components of this material are found on the regulatory lists indicated.

Ethylene Glycol 35

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: ENCS (Japan).

WHMIS CLASSIFICATION:

Class D, Division 1, Subdivision B: Toxic Material -
Acute Lethality
Class D, Division 2, Subdivision A: Very Toxic Material -
Teratogenicity and Embryotoxicity
Reproductive Toxicity

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations. (See Hazardous Products Act (HPA), R.S.C. 1985, c.H-3,s.2).

MSDS PREPARATION:

This Material Safety Data Sheet has been prepared by the Toxicology and Health Risk Assessment Unit, ERTC, P.O. Box 1627, Richmond, CA 94804, (888)676-6183.

Revision Date: March 10, 2009

SECTION 16 OTHER INFORMATION

HMIS RATINGS: Health: 2* Flammability: 0 Reactivity: 0

LABEL RECOMMENDATION:

Label Category : ANTIFREEZE/COOLANT 3 - AFC3

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet:

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

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

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: CAT HYDO ADVANCED 10

Product Description: Base Oil and Additives

MSDS Number: 19993

Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: Imperial Oil Products Division

240 4th Avenue

Calgary, ALBERTA. T2P 3M9 Canada

24 Hour Environmental / Health Emergency 519-339-2145

Telephone

Transportation Emergency Phone Number 519-339-2145

Product Technical Information 1-800-268-3183

Supplier General Contact 1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID: Health: 0 Flammability: 1 Reactivity: 0

HMIS Hazard ID: Health: 0 Flammability: 1 Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurised mists may form a flammable mixture.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >200C (392F) [Estimated ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable

regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders. For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Colour: Amber
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.87
Flash Point [Method]: >200C (392F) [Estimated ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (600F)
Vapour Density (Air = 1): > 2 at 101 kPa
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 42 cSt (42 mm²/sec) at 40 °C | 6.7 cSt (6.7 mm²/sec) at 100C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -33 °C (-27 °F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar

	materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

Additional information is available by request.

CMR Status: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A

3 = IARC 2B
4 = ACGIH ALL

5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG): Not Regulated for Land Transport

LAND (DOT): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

Complies with the following national/regional chemical inventory requirements: AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ZINC DITHIOPHOSPHATE	68649-42-3	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2

3 = TSCA 5e
4 = TSCA 6

5 = TSCA 12b
6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 09: Pour Point C(F) was modified.

Section 09: Relative Density was modified.

Section 16: MSN,MAT ID was modified.

Section 15: Canadian List Citations Table was modified.

Section 01: Product Identification Product Name was modified.

Section 06: Protective Measures was added.

Section 06: Accidental Release - Protective Measures - Header was added.

WHMIS Classification: Not controlled

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Prepared by: Imperial Oil Limited, IH and Product Safety

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: CAT TDTO COLD WEATHER 0W-20

Product Description: Base Oil and Additives

MSDS Number: 20807

Intended Use: Manual transmission fluid

COMPANY IDENTIFICATION

Supplier: Imperial Oil Products Division

240 4th Avenue

Calgary, ALBERTA. T2P 3M9 Canada

24 Hour Environmental / Health Emergency 519-339-2145

Telephone

Transportation Emergency Phone Number 519-339-2145

Product Technical Information 1-800-268-3183

Supplier General Contact 1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID: Health: 0 Flammability: 1 Reactivity: 0

HMIS Hazard ID: Health: 0 Flammability: 1 Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5	FIRE FIGHTING MEASURES
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EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: 160C (320F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6	ACCIDENTAL RELEASE MEASURES
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NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	STEL	10 mg/m ³			ACGIH
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m ³			ACGIH

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Colour: Amber
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.87
Flash Point [Method]: 160C (320F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: N/D
Vapour Density (Air = 1): N/D
Vapour Pressure: < 0.1 kPa (0.75 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): < 0.1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 34 cSt (34 mm2/sec) at 40°C | 7.4 cSt (7.4 mm2/sec) at 100C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -51°C (-60°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

<u>Route of Exposure</u>	<u>Conclusion / Remarks</u>
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.

Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

Additional information is available by request.

CMR Status: None.

Chemical Name	CAS Number	List Citations
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	4

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A

3 = IARC 2B
4 = ACGIH ALL

5 = ACGIH A1
6 = ACGIH A2

SECTION 12

ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may

reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG): Not Regulated for Land Transport

LAND (DOT): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

NATIONAL CHEMICAL INVENTORY LISTING: DSL, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
Nonyl Phenyl Ethoxylate	9016-45-9	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2

3 = TSCA 5e
4 = TSCA 6

5 = TSCA 12b
6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

No revision information is available.

WHMIS Classification: Not controlled

The information and recommendations contained herein are, to the best of Imperial Oil's knowledge and belief, accurate and reliable as of the date issued. Imperial Oil assumes no responsibility for accuracy of information unless the document is the most current available from an official Imperial Oil distribution system. The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted.

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Prepared by: Imperial Oil Limited, IH and Product Safety



MATERIAL SAFETY DATA SHEET

CAT ULTRA 5MOLY GREASE (NLGI #1)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME	CAT ULTRA 5MOLY GREASE (NLGI #1)
PART No.	Caterpillar, 161-0970, 161-0971, 161-9203, 183-3432, 266-8562, 266-8564 Chemtool, CSM1508000
PRODUCT USE	Lubricating Grease
SUPPLIER	Chemtool Incorporated 801 West Rockton Road Rockton, IL 61072 USA Tel: (815) 957-4140 Fax: (815) 624-0292
EMERGENCY TELEPHONE	Rocky Mountain Poison Center Denver, Colorado (800) 458-5924 U.S. and Canada. (303) 893-1322 Outside U.S.

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS No.	WEIGHT
CALCIUM SULFONATE COMPLEX THICKENER (PROPRIETARY INGREDIENT# 28287)	Proprietary	30-50 %
DISTILLATES, PETROLEUM, HYDROTREATED HEAVY NAPHTHENIC	64742-52-5	30-50 %
DISTILLATES, PETROLEUM, HEAVY (64741-88-4, 64741-96-4, 64742-52-5, 64742-54-7)	Mixture	10-30 %
*MOLYBDENUM SULFIDE (MoS ₂)	1317-33-5	3-7 %
BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT	26264-06-2	1-5 %
CARBONIC ACID CALCIUM SALT (COMMON NAME: CALCIUM CARBONATE)	471-34-1	1-5 %

* This chemical(s) is hazardous according to OSHA/WHIMIS criteria

COMPOSITION COMMENTS

Refer to section eight for exposure limits on ingredients.
Chemical ingredients not regulated by OSHA, SARA, state or federal agencies are treated confidentially.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	Not regarded as a health hazard under current legislation.
INHALATION	Inhalation hazard at room temperature is unlikely due to the low volatility of this product. Heating can generate vapors that may cause respiratory irritation, nausea and headaches.
INGESTION	May cause stomach pain or vomiting.

SKIN	Prolonged or repeated contact leads to drying of skin.
EYES	May be slightly irritating to eyes.
SENSITIZATION	No known information.
CARCINOGENICITY	IARC: Not listed as a Group 1, 2A, or 2B agent. OSHA: Not regulated. NTP: Not listed.
TERATOGENICITY	No known information.
HEALTH WARNINGS	INHALATION. Heating can generate vapors that may cause respiratory irritation, nausea and headaches. Inhalation hazard at room temperature is unlikely due to the low volatility of this product. SKIN CONTACT. Repeated or prolonged contact can result in drying of the skin. EYE CONTACT. Slightly irritating. INGESTION. Can cause stomach ache and vomiting.
ROUTE OF ENTRY	Inhalation. Skin and/or eye contact. Ingestion.

4. FIRST AID MEASURES

INHALATION	Move the exposed person to fresh air at once. For breathing difficulties oxygen may be necessary. Get medical attention if any discomfort continues.
EYES	Rinse with water. Contact physician if discomfort continues.
SKIN	Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues. INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.
INGESTION	DO NOT INDUCE VOMITING! Get medical attention immediately!

5. FIRE FIGHTING MEASURES

FLASH POINT (°C)	232 (450°F) Cd OC (Cleveland open cup).
FLAMMABILITY LIMIT - LOWER(%)	N/D
FLAMMABILITY LIMIT - UPPER(%)	N/D
EXTINGUISHING MEDIA	Water spray, fog or mist. Foam. Carbon dioxide (CO ₂). Dry chemicals, sand, dolomite etc.
SPECIAL FIRE FIGHTING PROCEDURES	Use water to keep fire exposed containers cool and disperse vapors. Water spray may be used to flush spills away from exposures and dilute spills to non-flammable mixtures. Avoid water in straight hose stream; will scatter and spread fire. Keep run-off water out of sewers and water sources. Dike for water control.
UNUSUAL FIRE & EXPLOSION HAZARDS	Volume and pressure increases strongly when heated. Risk of container explosion in fire.
HAZARDOUS COMBUSTION PRODUCTS	Acrid smoke/fumes. Oxides of: Carbon. Sulfur.
PROTECTIVE MEASURES IN CASE OF FIRE	Self-contained breathing equipment and chemical resistant clothing recommended.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS	Minimize skin contact.
PRECAUTIONS TO PROTECT THE ENVIRONMENT	Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with applicable government regulations.
SPILL CLEAN-UP PROCEDURES	Provide good ventilation. Use appropriate protective clothing. Carefully collect spilled material in closed containers and leave for disposal according to local regulations. Do not let washing down water contaminate ponds or waterways. Rinse area with water.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS	Keep away from heat, sparks and open flame. Ventilate well, avoid breathing vapors. Use approved respirator if air contamination is above accepted level. Containers should be kept tightly closed. Avoid spilling, skin and eye contact. Eye wash and emergency shower must be available at the work place.
STORAGE PRECAUTIONS	Keep away from heat, sparks and open flame. Store separated from: Acids. Oxidizing materials.
STORAGE CRITERIA	Chemical storage.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

COMPONENT	STD	TWA	STEL	TWA	STEL
DISTILLATES, PETROLEUM, HYDROTREATED HEAVY NAPHTHENIC	OSHA			5 mg/m3 ^{**} (1)	
	ACGIH			5 mg/m3 ^{**} (1)	10 mg/m3 ^{**} (1)
DISTILLATES, PETROLEUM, HEAVY (64741-88-4, 64741-96-4, 64742-52-5, 64742-54-7)	OSHA			5 mg/m3 ^{**} (1)	
	ACGIH			5 mg/m3 ^{**} (1)	10 mg/m3 ^{**} (1)
MOLYBDENUM SULFIDE (MoS ₂)	OSHA			10 mg/m3	
	ACGIH			10 mg/m3	
CARBONIC ACID CALCIUM SALT (COMMON NAME: CALCIUM CARBONATE)	OSHA			5 mg/m3 ^{**} (2)	
	ACGIH			10 mg/m3 ^{**} (e)	

INGREDIENT COMMENTS	<p>^{**}(1) For respirable oil mist.</p> <p>^{**}(2) For respirable dust. ACGIH TLV = 10 mg/m3 for total dust.</p> <p>^{**}ACGIH (e): Total dust, containing no asbestos and <1% crystalline silica</p>
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PROTECTIVE EQUIPMENT



ENGINEERING CONTROLS	Use engineering controls to reduce air contamination to permissible exposure level.
VENTILATION	No specific ventilation requirements noted, but forced ventilation may still be required if air contamination exceeds acceptable level.
RESPIRATORS	No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists.
PROTECTIVE GLOVES	Chemical resistant gloves required for prolonged or repeated contact. Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.

EYE PROTECTION	Use eye protection.
PROTECTIVE CLOTHING	Wear appropriate clothing to prevent repeated or prolonged skin contact.
HYGIENIC WORK PRACTICES	Wash at the end of each work shift and before eating, smoking and using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE	Grease.		
COLOR	Dark. Grey.		
ODOR	Mild (or faint).		
SOLUBILITY DESCRIPTION	Insoluble in water.		
DENSITY	0.96	Temperature (°C)	16 (60°F)
VAPOR DENSITY (air=1)	> 5		
VAPOR PRESSURE	< 0.01 mmHg	Temperature (°C)	20 (68°F)
EVAPORATION RATE	< 1	Reference	BuAc=1
pH-VALUE, CONC. SOLUTION	N/A		

10. STABILITY AND REACTIVITY

STABILITY	Normally stable.
CONDITIONS TO AVOID	Avoid contact with acids and oxidizing substances.
HAZARDOUS POLYMERIZATION	Will not polymerize.
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of: Carbon. Sulfur.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION	No experimental toxicological data on the preparation as such is available.
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COMPONENT	CALCIUM SULFONATE COMPLEX THICKENER (PROPRIETARY INGREDIENT# 28287)
TOXIC DOSE - LD 50	N/A.
TOXIC CONC. - LC 50	N/A.
COMPONENT	DISTILLATES, PETROLEUM, HYDROTREATED HEAVY NAPHTHENIC
TOXICOLOGICAL DATA	IP 346: < 3%
TOXIC DOSE - LD 50	> 5000 mg/kg (oral rat)
TOXIC DOSE - LD 50 SKIN	> 2000 mg/kg (skn rbt)
CARCINOGENICITY	The petroleum base oil contained in this product has been highly refined to remove aromatics and improve performance characteristics. The base oil is not listed as a carcinogen by NTP, IARC, or OSHA.
COMPONENT	DISTILLATES, PETROLEUM, HEAVY (64741-88-4, 64741-96-4, 64742-52-5, 64742-54-7)
TOXIC DOSE - LD 50	N/A.
TOXIC CONC. - LC 50	N/A.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION No data on possible environmental effects have been found.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS Spilled material, unused contents and empty containers must be disposed of in accordance with local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT HAZARD CLASS Not regulated.

TDGR CLASS Not Regulated. Non réglementé.

SEA TRANSPORT NOTES Not regulated per IMDG.

AIR TRANSPORT NOTES Not regulated per IATA.

15. REGULATORY INFORMATION

US FEDERAL REGULATIONS: COMPONENT	SARA 302	CERCLA	SARA 313
CALCIUM SULFONATE COMPLEX THICKENER (PROPRIETARY INGREDIENT# 28287)	No	No	No
DISTILLATES, PETROLEUM, HYDROTREATED HEAVY NAPHTHENIC	No	No	No
DISTILLATES, PETROLEUM, HEAVY (64741-88-4, 64741-96-4, 64742-52-5, 64742-54-7)	No	No	No
MOLYBDENUM SULFIDE (MoS ₂)	No	No	No
BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT	No	1 000 lbs	No
CARBONIC ACID CALCIUM SALT (COMMON NAME: CALCIUM CARBONATE)	No	No	No

*** Indicates that no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985). Values in Section 313 column represent Category Codes for reporting under Section 313.

SARA HAZARD CATEGORIES None

US STATE REGULATIONS: BY COMPONENT	CA	FL	MA	MN	NJ	PA	RI
BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT						EH	

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM - WHMIS This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

CONTROLLED PRODUCT CLASSIFICATION Not a controlled product.

INVENTORIES: COMPONENT	CAN	US	EU	AUS	JAP	KOR	CHN	PHLP
MOLYBDENUM SULFIDE (MoS ₂)	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes

BENZENESULFONIC ACID, DODECYL-, CALCIUM SALT	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes
CARBONIC ACID CALCIUM SALT (COMMON NAME: CALCIUM CARBONATE)	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes
DISTILLATES, PETROLEUM, HEAVY (64741-88-4, 64741-96-4, 64742-52-5, 64742-54-7)	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes
CALCIUM SULFONATE COMPLEX THICKENER (PROPRIETARY INGREDIENT# 28287)	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes
DISTILLATES, PETROLEUM, HYDROTREATED HEAVY NAPHTHENIC	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes

All components of this product comply with new substance notification requirements under the Canadian Environmental Protection Act (CEPA).

16. OTHER INFORMATION

HEALTH	Irritation, minor residual injury (1) - HMIS/NFPA
FLAMMABILITY	Burns only if pre-heated (1) - HMIS/NFPA
REACTIVITY	Normally Stable (0) - HMIS/NFPA
NPCA HMIS PERS. PROTECT. INDEX	B - Safety Eyewear and Gloves
PREPARED BY	Regulatory Dept, Chemtool Incorporated
DATE	2010-08-28
PRINTING DATE:	2010-08-28
DISCLAIMER	While the information and recommendations set forth herein are believed to be accurate as of the date thereof, Chemtool Incorporated makes no warranty with respect thereto and disclaims all liability from reliance therein.



MATERIAL SAFETY DATA SHEET

PRS FUEL OIL CLEANER

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER'S NAME : ROCHESTER MIDLAND LIMITED
 MANUFACTURERS ADDRESS : 851 PROGRESS COURT, OAKVILLE, ONTARIO
 EMERGENCY PHONE NUMBER: CANUTEC (613) 996-6666
 SUPPLIER IDENTIFIER: NOT AVAILABLE
 SUPPLIER'S ADDRESS: NOT AVAILABLE
 SUPPLIER EMERGENCY PHONE NUMBER: NOT AVAILABLE
 PRODUCT NAME : PRS FUEL OIL CLEANER
 PRODUCT USE : MICROBIAL BASED DEODORIZER AND CLEANER
 WHMIS CATEGORY: D2B
 PREPARED BY : ROCHESTER MIDLAND LIMITED.
 PHONE NUMBER OF PREPARER: (905) 847-3000
 DATE PREPARED: JULY 31, 2007

SECTION 02: COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS#	EXPOSURE LEVELS	LD (50), ROUTE, SPECIES	LC(50), ROUTE, SPECIES
NO HAZARDOUS INGREDIENTS LISTED UNDER WHMIS INGREDIENT DISCLOSURE LIST.					
OTHER INGREDIENTS	%	CAS#	EXPOSURE LEVELS	LD (50), ROUTE, SPECIES	LC(50), ROUTE, SPECIES
VIABLE BACTERIAL CULTURES	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
ETHOXYLATED LINEAR ALCOHOL	10-30	68439-46-3	NOT AVAILABLE	ORAL 1378 mg/ Kg (RAT) DERMAL >2000 mg/ Kg (RABBIT)	NOT AVAILABLE
ALKYL ARYL SULFONIC ACID	1-5	68584-22-5	NOT AVAILABLE	ORAL 530 mg/ Kg (RAT)	NOT AVAILABLE

SECTION 03: HAZARDS IDENTIFICATION

POTENTIAL ACUTE HEALTH EFFECTS:

ROUTE OF ENTRY: EYES, SKIN, INHALATION, INGESTION
 SKIN CONTACT: MAY CAUSE IRRITATION. ORGANISMS USED ARE NON-PATHOGENIC BUT CAN CAUSE INFECTION WHEN IN CONTACT WITH OPEN WOUNDS OR BROKEN SKIN. THESE ORGANISMS ARE SUSCEPTIBLE TO MANY COMMONLY -USED ANTIBIOTICS.
 SKIN ABSORPTION : SYSTEMATICALLY TOXIC CONCENTRATIONS WILL PROBABLY NOT BE ABSORBED THROUGH THE SKIN.
 EYE: DIRECT CONTACT MAY CAUSE IRRITATION.
 INHALATION: MAY CAUSE IRRITATION, COUGHING, CONGESTION.
 INGESTION: MAY CAUSE IRRITATION, NAUSEA OR VOMITING.
 ACUTE OVER-EXPOSURE EFFECTS: AS ABOVE. OVEREXPOSURE MAY CAUSE HEADACHE, DIZZINESS, TIREDNESS, NAUSEA AND VOMITING.
 CHRONIC OVER EXPOSURE EFFECTS: DERMATITIS

MATERIAL SAFETY DATA SHEET

SECTION 04: FIRST AID MEASURES

EYES: FLUSH EYES WITH ABUNDANT WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN TO ENSURE COMPLETE IRRIGATION OF THE ENTIRE EYE CAVITY. GET MEDICAL ATTENTION.

SKIN: WASH SKIN WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST, GET MEDICAL ATTENTION.

INHALATION: REMOVE VICTIM TO FRESH AIR. ASSIST BREATHING AS NEEDED. IF SYMPTOMS PERSIST, GET MEDICAL ATTENTION.

INGESTION: **DO NOT INDUCE VOMITING.** IF VICTIM CONSCIOUS, GIVE 1 - 2 GLASSES OF WATER TO DILUTE STOMACH CONTENTS. **GET MEDICAL ATTENTION.** NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIAN: ALL TREATMENTS SHOULD BE BASED ON OBSERVED SIGNS/SYMPTOMS OF DISTRESS IN THE PATIENT. THE POSSIBILITY OF OVEREXPOSURE TO MATERIALS OTHER THAN THIS PRODUCT SHOULD BE CONSIDERED

SECTION 05: FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD OF DETERMINATION: NONE. TCC

UPPER EXPLOSION LIMIT (% BY VOLUME): NOT APPLICABLE

LOWER EXPLOSION LIMIT (% BY VOLUME): NOT APPLICABLE

AUTO-IGNITION TEMPERATURE: NOT AVAILABLE

FLAMMABILITY CLASSIFICATION: NON-FLAMMABLE

CONDITIONS OF FLAMMABILITY: NONE (PRODUCT WILL NOT BURN).

MEANS OF EXTINCTION: USE WATER SPRAY, DRY CHEMICAL OR FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: FIREFIGHTERS SHOULD WEAR FULL PROTECTIVE EQUIPMENT AND USE APPROVED SELF CONTAINED BREATHING APPARATUS. USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS TO PREVENT PRESSURE BUILDUP AND POSSIBLE RUPTURE.

HAZARDOUS COMBUSTION PRODUCTS: OXIDES OF CARBON AND NITROGEN.

EXPLOSION DATA: NOT APPLICABLE

SENSITIVITY TO STATIC DISCHARGE: NOT SENSITIVE

SENSITIVITY TO MECHANICAL IMPACT: NOT SENSITIVE

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK AND SPILL PROCEDURES: REMOVE UNPROTECTED PERSONNEL AWAY FROM SPILL AREA. VENTILATE AREA. CLEANUP PERSONNEL MUST WEAR APPROPRIATE EQUIPMENT AS OUTLINED ABOVE. CAUTION: SPILL AREA MAY BE SLIPPERY.

SMALL SPILLS: MOP UP, FLUSH RESIDUE WITH WATER.

LARGE SPILLS: DIKE SPILL. RECLAIM ALL MATERIAL POSSIBLE. ABSORB REMAINDER WITH INERT MATERIAL AND PLACE IN SUITABLE CONTAINERS FOR DISPOSAL. FLUSH RESIDUE WITH WATER. CLEAN SPILL AREA WITH DETERGENT AND WATER.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND EQUIPMENT: DO NOT GENERATE / BREATHE MISTS. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE. AVOID CONTACT WITH OPEN WOUNDS OR BROKEN SKIN. WASH SKIN THOROUGHLY WITH SOAP AND WATER AFTER USE. KEEP CONTAINER CLOSED WHEN NOT IN USE. READ AND FOLLOW ALL PRODUCT LABELS. DO NOT CONTAMINATE FOOD, FEED OR POTABLE WATER DURING USE OR STORAGE OF THIS PRODUCT.

STORAGE REQUIREMENTS: KEEP OUT OF REACH OF CHILDREN. STORE AWAY FROM FOOD ITEMS AND POTABLE WATER SYSTEMS. STORE IN A COOL WELL VENTILATED AREA. (MIN 4 °C MAX 60 °C). AVOID EXPOSURES TO TEMPERATURE EXTREMES TO MAINTAIN SHELF LIFE. DO NOT RE-USE CONTAINER. STORE IN ORIGINAL CONTAINER. DO NOT FREEZE.

MATERIAL SAFETY DATA SHEET

SECTION 08: EXPOSURE CONTROLS/ PERSONAL PROTECTION

EYE PROTECTION: WEAR CHEMICAL SAFETY GLASSES WITH SIDE SHIELDS.
RESPIRATORY PROTECTION: NONE NORMALLY REQUIRED. USE NIOSH APPROVED RESPIRATOR IF EXPOSURE LEVELS ARE EXCEEDED OR IF SPRAY MIST CAUSES IRRITATION.
GLOVES: WEAR RUBBER, NEOPRENE OR VINYL GLOVES. INCIDENTAL SKIN CONTACT IS NOT EXPECTED TO CAUSE ANY SIGNIFICANT IRRITATION.
OTHER PROTECTIVE EQUIPMENT: AS NEEDED TO PREVENT ALL CONTACT WITH PRODUCT.
SPECIFIC ENGINEERING CONTROLS..... NONE NORMALLY REQUIRED. USE GENERAL MECHANICAL AND / OR LOCAL EXHAUST AS NEEDED IF MIST IN THE AIR.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: LIQUID
ODOUR AND APPEARANCE: OPAQUE WHITE LIQUID WITH MILD CHEMICAL ODOUR.
ODOUR THRESHOLD: NOT AVAILABLE
SPECIFIC GRAVITY: 0.99-1.005
VAPOUR PRESSURE : NOT AVAILABLE
VAPOUR DENSITY (AIR=1): NOT AVAILABLE
VOC CONTENT (%): NOT AVAILABLE
EVAPORATION RATE: AS WATER
BOILING POINT: NOT AVAILABLE
PH: 7-9.5
FREEZING POINT: 0 °C (32 °F) (VIABLE BACTERIAL CULTURES WILL DIE AT LOW TEMPERATURES). DO NOT FREEZE.
DENSITY (g/ ml): 0.99-1.005
COEFFICIENT OF WATER/OIL DISTRIBUTION: COMPLETELY WATER SOLUBLE

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: STABLE UNDER RECOMMENDED STORAGE CONDITIONS. (MIN 4 °C MAX 60 °C).
INCOMPATIBLE MATERIALS: AVOID OXIDIZERS, STRONG ACIDS OR ALKALIS AS MAY INACTIVATE BACTERIAL CULTURES.
CONDITIONS OF REACTIVITY: AVOID TEMPERATURE EXTREMES AS VIABLE BACTERIAL CULTURES MAY BE INACTIVATED.
HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON AND NITROGEN

SECTION 11: TOXICOLOGICAL INFORMATION

IRRITANCY OF PRODUCT: MILD IRRITANT
SENSITIZATION TO MATERIAL: INDIVIDUALS WITH A HISTORY OF DERMAL ALLERGIC REACTION MAY EXPERIENCE SLIGHT REDNESS ON HANDS AND FOREARMS.
CARCINOGENICITY,: NO KNOWN CARCINOGENS LISTED BY OSHA, IARC OR NTP.
REPRODUCTIVE EFFECTS: NO KNOWN REPRODUCTIVE EFFECTS.
TERATOGENICITY: NOT AVAILABLE.
MUTAGENICITY: NOT AVAILABLE
TOXICOLOGICALLY SYNERGISTIC PRODUCTS: NOT AVAILABLE.

MATERIAL SAFETY DATA SHEET

SECTION 12: ECOLOGICAL INFORMATION

THERE IS NO ECOLOGICAL INFORMATION AVAILABLE FOR PRODUCT. INDIVIDUAL COMPONENT INFORMATION (AS AVAILABLE) ONLY. ECOTOXICOLOGICAL INFORMATION TO FOLLOW IS BASED LARGELY OR COMPLETELY ON INFORMATION FOR COMPONENTS ON A 100% ACTIVE INGREDIENT BASIS.

ECOTOXICOLOGICAL INFORMATION:

AQUATIC TOXICITY: FISH SPECIES DATA: ETHOXYLATED LINEAR ALCOHOL LC50, 96 HR STATIC ACUTE, FATHEAD MINNOW: 8.5 mg/L
ALKYL ARYL SULFONIC ACID LC50, 96 HR, STATIC, ONCORHYNCHUS MYKISS: 3 mg/L
AQUATIC TOXICITY: INVERTEBRATES: ETHOXYLATED LINEAR ALCOHOL LC50, 96 HR STATIC ACUTE, DAPHNIA: 5.3 mg/L
ALKYL ARYL SULFONIC ACID EC50, 48 HR, DAPHNIA MAGNA: 2.9 mg/L

AQUATIC TOXICITY: (GROWTH INHIBITION) PLANTS: NO DATA

ACUTE AQUATIC TOXICITY: MICROORGANISMS: ALKYLARYL SULFONIC ACID EC50, 6 HR, PSEUDOMONAS FLUORESCENS: 5 mg/L

BIODEGRADABILITY: ETHOXYLATED, LINEAR ALCOHOL COMPONENT IS READILY BIODEGRADABLE. ETHOXYLATED LINEAR ALCOHOL COMPONENT HAS 88% OXYGEN REMOVAL IN 28 DAYS. 100% DOC REMOVAL

MOBILITY: NOT AVAILABLE.

PERSISTENCE: NOT AVAILABLE

BIOACCUMULATIVE: NOT AVAILABLE

CHEMICAL FATE INFORMATION: NOT AVAILABLE.

OTHER INFORMATION: NOT AVAILABLE.

SECTION 13: DISPOSAL CONSIDERATIONS

IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

TDG : NOT REGULATED UNDER TDG

ADDITIONAL INFORMATION: NOT AVAILABLE

MARINE POLLUTANT: NO

SECTION 15: REGULATORY INFORMATION:

DSL STATUS: LISTED

WHMIS CLASSIFICATION: D2B

THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR (CONTROLLED PRODUCTS REGULATIONS) AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

DISCLAIMER: THIS INFORMATION WAS COMPILED FROM CURRENT, RELIABLE SOURCES AND IS BELIEVED TO BE CORRECT. AS DATA AND/OR REGULATIONS CHANGE, AND CONDITIONS OF USE ARE BEYOND OUR CONTROL, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO COMPLETENESS OR CONTINUING ACCURACY OF THIS INFORMATION.

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURE'S INFORMATION

NFPA Rating: Health-2; Flammability-2; Reactivity-0; Special- -	HMIS Rating: Health-2; Flammability-2; Reactivity-0; Personal Protection-B
Manufacturer's Name: AMREP INC. Address: 990 Industrial Park Drive Marietta, GA 30062	DOT Hazard Classification: Flammable liquid, 3 Identity (trade name as used on label): Next Dimension Parts Wash
Phone: 770-422-2071	MSDS Number: B01362ND Revision - 10
EMERGENCY RESPONSE NUMBER: 1-800-255-3924	Prepared: 05/08/01 Prepared By: DL/LF/IB
NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA	Information Calls: (770)422-2071

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	CAS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
MINERAL SPIRITS	64742-88-7	No	N/E	N/E	d

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 300°F	Specific Gravity (H ₂ O=1): 0.78
Vapor Pressure: PSIG @ 70°F (Aerosols): N/A	Vapor Pressure (Non-Aerosols)(mm Hg and Temperature): ND
Vapor Density (Air = 1): 5	Evaporation Rate (= 1): N/D
Solubility in Water: Negligible	Water Reactive: No
Appearance and Odor: Blue colored liquid with petroleum odor.	VOC (Federal EPA Definition) = 100% (by weight)

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA FLAME PROJECTION TEST (aerosols) N/A	Auto Ignition Temperature N/D	Flammability Limits in Air by % in Volume: % LEL: 1 % UEL: 6
FLASH POINT AND METHOD USED (non-aerosols): 107°F TCC	SPECIAL FIRE FIGHTING PROCEDURES: Do not enter confined fire space without proper protective equipment including NIOSH approved self-contained breathing apparatus. Cool fire exposed containers, surrounding equipment & structures with water.	
EXTINGUISHER MEDIA: Water spray or fog, foam, dry chemical or CO ₂ . Do not use direct water stream.		
Unusual Fire & Explosion Hazards: None known.		

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [] UNSTABLE	HAZARDOUS POLYMERIZATION [] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): Oxidizing materials.	Conditions to Avoid: Heat, sparks, open flame.
Hazardous Decomposition Products: Oxides of carbon & unidentified organics may be formed during combustion.	

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: <input type="checkbox"/> INHALATION <input type="checkbox"/> INGESTION <input checked="" type="checkbox"/> SKIN ABSORPTION <input type="checkbox"/> EYE <input type="checkbox"/> NOT HAZARDOUS	
ACUTE EFFECTS: Toxicity: CNS depression producing headache, dizziness, nausea and loss of consciousness.	
Inhalation: High concentrations or prolonged exposure to lower concentrations may be slightly irritating to mucous membranes.	
Eye Contact: Slight irritation from short term contact. Prolonged & repeated contact more irritating.	Skin Contact: Prolonged & repeated liquid contact may result in irritation and dermatitis.
Ingestion: May result in vomiting. Aspiration of vomitus into lungs must be avoided as lung contact can result in chemical pneumonitis and pulmonary edema.	
CHRONIC EFFECTS: None known.	
Medical Conditions Generally Aggravated by Exposure: Pre-existing irritation of skin or mucous membranes.	

EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. If irritation persists, get medical attention.
Skin Contact: Wash with soap and water. If irritation persists, get medical attention.
Inhalation: Remove to fresh air. Provide oxygen if breathing is difficult. Get medical attention.
Ingestion: DO NOT INDUCE VOMITING. Drink 3 to 4 glasses of water. Get immediate medical attention.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type): As required to prevent overexposure. NIOSH approved air purifying respirator for organic vapors or atmosphere-supplying respirator.	
Protective Gloves: As required to minimize skin contact.	Eye Protection: Safety glasses or goggles.
Ventilation Requirements: Explosion proof ventilation as required to control vapor concentrations.	
Other Protective Clothing & Equipment: Clothing as required to minimize skin contact. Eyewash station and safety shower.	
Hygienic Work Practices: Do not eat, drink or smoke in work area. Wash hands after handling.	

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Contain spill. Keep out of surface waters & any sewers or water courses entering or leading to surface waters. Soak up with inert absorbent & place in properly labeled leak-proof containers for disposal.
Waste Disposal Methods: Dispose of in accordance with all local, state and federal regulations.
Precautions To Be Taken In Handling & Storage: Store in original shipping containers away from heat, open flame & oxidizing materials. Keep closed when not in use. Shelf life 1 year.
Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN. Read & follow label directions.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only

THIS MSDS IS CURRENT AS OF **September 23, 2009**. The DATE PREPARED section is the original date assembled and remains current until a change is necessary. This is tracked internally at the manufacturer by these date codes and therefore must remain as the originating date.



Material Safety Data Sheet

Synthetic ATF Universal Automatic Transmission Fluid

Section 1. Product and company identification

Product name

Synthetic ATF Universal Automatic Transmission Fluid

Material uses

Lubricating oil.

Supplier/Manufacturer

AMSOIL INC.
925 Tower Avenue
Superior, WI 54880

Code

ATF

MSDS authored by

AMSOIL INC.

In case of emergency

CHEMTREC: (800) 424-9300

Section 2. Hazards identification

Emergency overview

Color	: Red.
Physical state	: Liquid.
Odor	: Mild. / Hydrocarbon.
Hazard statements	: NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
Precautions	: No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.
OSHA/HCS status	: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential acute health effects

Inhalation	: No known significant effects or critical hazards.
Ingestion	: No known significant effects or critical hazards.
Skin	: No known significant effects or critical hazards.
Eyes	: No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects	: No known significant effects or critical hazards.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation	: No specific data.
Ingestion	: No specific data.
Skin	: No specific data.
Eyes	: No specific data.

Medical conditions aggravated by over-exposure : None known.

See toxicological information (section 11)

Section 3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

Eye contact : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

Skin contact : After contact with skin, wash immediately with plenty of soap and water. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Section 5. Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Hazardous decomposition products : No specific data.

Special protective equipment for fire-fighters : No special protection is required.

Section 6. Accidental release measures

Personal precautions : Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Avoid contact with used product. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Under conditions which may generate mists, the following exposure limits are recommended:

ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
- Respiratory** : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Not required under normal conditions of use.
- Hands** : Use gloves appropriate for work or task being performed. Not required under normal conditions of use. Recommended: Disposable vinyl gloves.
- Eyes** : Safety eyewear should be used when there is a likelihood of exposure. Not required under normal conditions of use. Recommended: Safety glasses with side shields.
- Skin** : No special protective clothing is required.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 9. Physical and chemical properties

- | | | | |
|-------------------------|--|----------------------------------|------------------------|
| Physical state | : Liquid. | Odor | : Mild. / Hydrocarbon. |
| Color | : Red. | pH | : Not available. |
| Flash point | : Open cup: 234°C (453.2°F) [Cleveland.] | Auto-ignition temperature | : Not available. |
| Flammable limits | : Not available. | Melting point/ Pour point | : -53°C (-63.4°F) |
| Boiling point | : Not available. | Vapor pressure | : Not available. |
| Relative density | : 0.8428 | Vapor density | : Not available. |
| Volatility | : Not available. | Evaporation rate | : Not available. |

Viscosity	: Kinematic: 0.076 cm ² /s (7.6 cSt) (100°C) Kinematic: 0.389 cm ² /s (38.9 cSt) (40°C)	Solubility	: Not available.
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Section 10. Stability and reactivity

Chemical stability	: The product is stable.
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

<u>Acute toxicity</u>	: No specific data.
<u>Chronic toxicity</u>	: No specific data.

Section 12. Ecological information

Environmental effects	: Not established
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Section 13. Disposal considerations

Waste disposal	: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.
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Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT/TDG/IMDG/IATA	: Not regulated.
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Section 15. Regulatory information

United States

HCS Classification	: Not regulated.
U.S. Federal regulations	: United States inventory (TSCA 8b) : Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Water Act (CWA) 307: Cadmium; Arsenic; Lead; Ethylbenzene

Clean Water Act (CWA) 311: Xylene; Ethylbenzene

Clean Air Act (CAA) 112 accidental release prevention: Sulfur dioxide

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: Sulfur dioxide

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

California Prop. 65

WARNING: This product contains less than 0.1% of a chemical known to the State of California to cause cancer.

WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
Cadmium	Yes.	Yes.	0.05 µg/day (inhalation)	Yes.
Arsenic	Yes.	No.	0.06 µg/day (inhalation)	No.
Lead	Yes.	Yes.	15 µg/day (ingestion)	Yes.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists : **CEPA Toxic substances:** None of the components are listed.

Canadian ARET: None of the components are listed.

Canadian NPRI: None of the components are listed.

Alberta Designated Substances: None of the components are listed.

Ontario Designated Substances: None of the components are listed.

Quebec Designated Substances: None of the components are listed.

Canada inventory : Not determined.

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

International regulations

International lists : **Australia inventory (AICS):** Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.

Section 16. Other information

United States

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

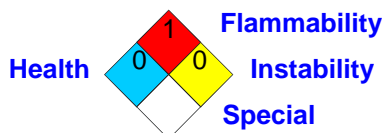
**Hazardous Material
Information System (U.S.A.)** :

Health	0
Flammability	1
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection
Association (U.S.A.)** :



Date of issue : 05/01/2010

Version : 1

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

Synthetic Blend 15W-40 12 TBN Diesel Motor Oil

Section 1. Product and company identification

Product name

Synthetic Blend 15W-40 12 TBN Diesel Motor Oil

Material uses

Lubricating oil.

Supplier/Manufacturer

AMSOIL INC.
925 Tower Avenue
Superior, WI 54880

Code

PCO

MSDS authored by

AMSOIL INC.

In case of emergency

CHEMTREC: (800) 424-9300

Section 2. Hazards identification

Emergency overview

- Color** : Brown.
- Physical state** : Liquid. [Clear.]
- Odor** : Mild. / Hydrocarbon.
- Hazard statements** : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
- Precautions** : No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.
- OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.
- Skin** : No known significant effects or critical hazards.
- Eyes** : No known significant effects or critical hazards.

Potential chronic health effects

- Chronic effects** : No known significant effects or critical hazards.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Inhalation** : No specific data.
- Ingestion** : No specific data.
- Skin** : No specific data.
- Eyes** : No specific data.

Medical conditions aggravated by over-exposure : None known.

See toxicological information (Section 11)

Section 3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

- Eye contact** : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.
- Skin contact** : After contact with skin, wash immediately with plenty of soap and water. Get medical attention if symptoms occur.
- Inhalation** : Move exposed person to fresh air. Get medical attention if symptoms occur.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Section 5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Hazardous decomposition products** : No specific data.
- Special protective equipment for fire-fighters** : No special protection is required.

Section 6. Accidental release measures

- Personal precautions** : Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

- Large spill** : Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment. Avoid contact with used product. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Under conditions which may generate mists, the following exposure limits are recommended:
ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
- Respiratory** : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Not required under normal conditions of use.
- Hands** : Use gloves appropriate for work or task being performed. Not required under normal conditions of use. Recommended: Disposable vinyl gloves.
- Eyes** : Safety eyewear should be used when there is a likelihood of exposure. Not required under normal conditions of use. Recommended: Safety glasses with side shields.
- Skin** : No special protective clothing is required.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 9. Physical and chemical properties

- | | | | |
|-----------------------|--|----------------------------------|------------------------|
| Physical state | : Liquid. [Clear.] | Odor | : Mild. / Hydrocarbon. |
| Color | : Brown. | pH | : Not available. |
| Flash point | : Open cup: 232°C (449.6°F) [Cleveland.] | Auto-ignition temperature | : Not available. |

Flammable limits	: Not available.	Melting point/ Pour point	: -36°C (-32.8°F)
Boiling point	: Not available.	Vapor pressure	: Not available.
Relative density	: 0.8708	Vapor density	: Not available.
Volatility	: Not available.	Evaporation rate	: Not available.
Viscosity	: Kinematic: 0.156 cm ² /s (15.6 cSt) (100°C) Kinematic: 1.149 cm ² /s (114.9 cSt) (40°C)	Solubility	: Not available.

Section 10. Stability and reactivity

Chemical stability	: The product is stable.
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Acute toxicity	: No specific data.
Chronic toxicity	: No specific data.

Section 12. Ecological information

Environmental effects	: Not established
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Section 13. Disposal considerations

Waste disposal	: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.
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Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT/TDG/IMDG/IATA	: Not regulated.
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Section 15. Regulatory information

United States

- HCS Classification** : Not regulated.
- U.S. Federal regulations** : **United States inventory (TSCA 8b)**: Not determined.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.
Clean Water Act (CWA) 307: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts
Clean Air Act (CAA) 112 accidental release prevention: No products were found.

State regulations

- Massachusetts** : None of the components are listed.
- New York** : None of the components are listed.
- New Jersey** : The following components are listed: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts
- Pennsylvania** : The following components are listed: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts

California Prop. 65

WARNING: This product contains less than 0.1% of a chemical known to the State of California to cause cancer.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Paraffin oils	Yes.	No.	No.	No.

Canada

- WHMIS (Canada)** : Not controlled under WHMIS (Canada).
- Canadian lists** : **CEPA Toxic substances**: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.
- Canada inventory** : Not determined.

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

International regulations

- International lists** : **Australia inventory (AICS)**: Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.

Section 16. Other information

United States

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

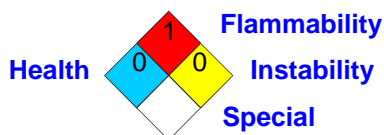
Hazardous Material Information System (U.S.A.) :

Health	0
Flammability	1
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of issue : 03/15/2011

Date of previous issue : 07/22/2010

Version : 2

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

Severe Gear® SAE 75W-90 Synthetic Extreme Pressure Lubricant

Section 1. Product and company identification

Product name

Severe Gear® SAE 75W-90 Synthetic Extreme Pressure Lubricant

Material uses

Lubricating Fluid.

Supplier/Manufacturer

AMSOIL INC.
925 Tower Avenue
Superior, WI 54880

Code

SVG

MSDS authored by

AMSOIL INC.

In case of emergency

CHEMTREC: (800) 424-9300

Section 2. Hazards identification

Emergency overview

- Color** : Amber.
- Physical state** : Liquid. [Fluid.]
- Odor** : Aromatic hydrocarbon.
- Hazard statements** : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
- Precautions** : No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.
- OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.
- Skin** : No known significant effects or critical hazards.
- Eyes** : No known significant effects or critical hazards.

Potential chronic health effects

- Chronic effects** : No known significant effects or critical hazards.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Inhalation** : No specific data.
- Ingestion** : No specific data.
- Skin** : No specific data.
- Eyes** : No specific data.

Medical conditions aggravated by over-exposure : None known.

See toxicological information (section 11)

Section 3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

- Eye contact** : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.
- Skin contact** : After contact with skin, wash immediately with plenty of soap and water. Get medical attention if symptoms occur.
- Inhalation** : Move exposed person to fresh air. Get medical attention if symptoms occur.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Section 5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Hazardous decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
- Special protective equipment for fire-fighters** : No special protection is required.

Section 6. Accidental release measures

- Personal precautions** : Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

- Large spill** : Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Avoid contact with used product. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Under conditions which may generate mists, the following exposure limits are recommended:

ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
- Respiratory** : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Not required under normal conditions of use.
- Hands** : Use gloves appropriate for work or task being performed. Not required under normal conditions of use. Recommended: Disposable vinyl gloves.
- Eyes** : Safety eyewear should be used when there is a likelihood of exposure. Not required under normal conditions of use. Recommended: Safety glasses with side shields.
- Skin** : No special protective clothing is required.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 9. Physical and chemical properties

- | | | | |
|-----------------------|--|----------------------------------|-------------------------|
| Physical state | : Liquid. [Fluid.] | Odor | : Aromatic hydrocarbon. |
| Color | : Amber. | pH | : Not available. |
| Flash point | : Open cup: 210°C (410°F) [Cleveland.] | Auto-ignition temperature | : Not available. |

Flammable limits	: Not available.	Melting point/ Pour point	: -48°C (-54.4°F)
Boiling point	: Not available.	Vapor pressure	: Not available.
Relative density	: 0.866	Vapor density	: Not available.
Volatility	: Not available.	Evaporation rate	: Not available.
Viscosity	: Kinematic: 0.169 cm ² /s (16.9 cSt) (100°C) Kinematic: 1.147 cm ² /s (114.7 cSt) (40°C)	Solubility	: Not available.

Section 10. Stability and reactivity

Chemical stability	: The product is stable.
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

<u>Acute toxicity</u>	: No specific data.
<u>Chronic toxicity</u>	: No specific data.

Section 12. Ecological information

Environmental effects	: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
------------------------------	---

Section 13. Disposal considerations

Waste disposal	: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.
-----------------------	---

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT/TDG/IMDG/IATA	: Not regulated.
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Section 15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations : **United States inventory (TSCA 8b)**: Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

California Prop. 65

No products were found.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists : **CEPA Toxic substances**: None of the components are listed.

Canadian ARET: None of the components are listed.

Canadian NPRI: The following components are listed: White mineral oil (petroleum)

Alberta Designated Substances: None of the components are listed.

Ontario Designated Substances: None of the components are listed.

Quebec Designated Substances: None of the components are listed.

Canada inventory : Not determined.

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

International regulations

International lists : **Australia inventory (AICS)**: Not determined.

China inventory (IECSC): Not determined.

Japan inventory: Not determined.

Korea inventory: Not determined.

New Zealand Inventory of Chemicals (NZIoC): Not determined.

Philippines inventory (PICCS): Not determined.

Section 16. Other information

United States

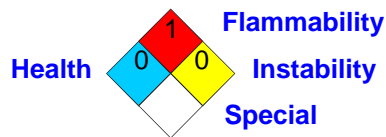
Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

**Hazardous Material
Information System (U.S.A.) :**

Health	0
Flammability	1
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection
Association (U.S.A.) :**

Date of issue : 09/01/2010

Version : 1

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

100% Synthetic 10W-30 High Performance Motor Oil

Section 1. Product and company identification

Product name

100% Synthetic 10W-30 High Performance Motor Oil

Material uses

Lubricating oil.

Supplier/Manufacturer

AMSOIL INC.
925 Tower Avenue
Superior, WI 54880

Code

ATM

MSDS authored by

AMSOIL INC.

In case of emergency

CHEMTREC: (800) 424-9300

Section 2. Hazards identification

Emergency overview

- | | |
|--------------------------|--|
| Color | : Amber. |
| Physical state | : Liquid. [Clear.] |
| Odor | : Mild. / Hydrocarbon. |
| Hazard statements | : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED. |
| Precautions | : No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing. |
| OSHA/HCS status | : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product. |

Potential acute health effects

- | | |
|-------------------|---|
| Inhalation | : No known significant effects or critical hazards. |
| Ingestion | : No known significant effects or critical hazards. |
| Skin | : No known significant effects or critical hazards. |
| Eyes | : No known significant effects or critical hazards. |

Potential chronic health effects

- | | |
|------------------------------|---|
| Chronic effects | : No known significant effects or critical hazards. |
| Carcinogenicity | : No known significant effects or critical hazards. |
| Mutagenicity | : No known significant effects or critical hazards. |
| Teratogenicity | : No known significant effects or critical hazards. |
| Developmental effects | : No known significant effects or critical hazards. |
| Fertility effects | : No known significant effects or critical hazards. |

Over-exposure signs/symptoms

- | | |
|-------------------|---------------------|
| Inhalation | : No specific data. |
| Ingestion | : No specific data. |
| Skin | : No specific data. |
| Eyes | : No specific data. |

Medical conditions aggravated by over-exposure : None known.

See toxicological information (section 11)

Section 3. Composition/information on ingredients

Canada

Name

Diphenylamine

CAS number

122-39-4

%

0.1 - 1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

- Eye contact** : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.
- Skin contact** : After contact with skin, wash immediately with plenty of soap and water. Get medical attention if symptoms occur.
- Inhalation** : Move exposed person to fresh air. Get medical attention if symptoms occur.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Section 5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
- Not suitable** : None known.
- Hazardous decomposition products** : No specific data.
- Special protective equipment for fire-fighters** : No special protection is required.

Section 6. Accidental release measures

- Personal precautions** : Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

- Large spill** : Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Avoid contact with used product. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

United States

Under conditions which may generate mists, the following exposure limits are recommended:
ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	Notations
Diphenylamine	US ACGIH 1/2009	-	10	-	-	-	-	-	-	-	
	AB 4/2009	-	10	-	-	-	-	-	-	-	
	BC 9/2009	-	10	-	-	-	-	-	-	-	
	ON 8/2008	-	10	-	-	-	-	-	-	-	
	QC 6/2008	-	10	-	-	-	-	-	-	-	

Under conditions which may generate mists, the following additional exposure limits are recommended:
ACGIH TLV TWA: 5 mg/m³ ; STEL: 10 mg/m³.

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
- Respiratory** : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Not required under normal conditions of use.
- Hands** : Use gloves appropriate for work or task being performed. Not required under normal conditions of use. Recommended: Disposable vinyl gloves.
- Eyes** : Safety eyewear should be used when there is a likelihood of exposure. Not required under normal conditions of use. Recommended: Safety glasses with side shields.

Skin	: No special protective clothing is required.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 9. Physical and chemical properties

Physical state	: Liquid. [Clear.]	Odor	: Mild. / Hydrocarbon.
Color	: Amber.	pH	: Not available.
Flash point	: Open cup: 226°C (438.8°F) [Cleveland.]	Auto-ignition temperature	: Not available.
Flammable limits	: Not available.	Melting point/ Pour point	: -48°C (-54.4°F)
Boiling point	: Not available.	Vapor pressure	: Not available.
Relative density	: 0.8602	Vapor density	: Not available.
Volatility	: Not available.	Evaporation rate	: Not available.
Viscosity	: Kinematic: 0.108 cm ² /s (10.8 cSt) (100°C) Kinematic : 0.633 cm ² /s (63.3 cSt) (40°C)	Solubility	: Not available.

Section 10. Stability and reactivity

Chemical stability	: The product is stable.
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Diphenylamine	LD50 Oral	Rat	1120 mg/kg	-

Chronic toxicity : No specific data.

Section 12. Ecological information

Environmental effects : Not established

Aquatic ecotoxicity

Product/ingredient name	Result	Species
Diphenylamine	Acute EC50 0.31 to 0.36 mg/L Fresh water Acute LC50 3790 to 4140 ug/L Fresh water	Daphnia - Daphnia magna - <24 hours 48 hours Fish - Pimephales promelas - 31 days - 96 hours 18.6 mm - 0.09 g

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

- Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

- DOT/TDG/IMDG/IATA** : Not regulated.

Section 15. Regulatory information

United States

HCS Classification

- : Not regulated.

U.S. Federal regulations

- : **United States inventory (TSCA 8b)**: Not determined.
TSCA 8(d) H and S data reporting: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts: 2006
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.
Clean Water Act (CWA) 307: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts
Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations

Massachusetts

- : None of the components are listed.

New York

- : None of the components are listed.

New Jersey

- : The following components are listed: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts

Pennsylvania

- : The following components are listed: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts

California Prop. 65

No products were found.

Canada

WHMIS (Canada)

- : Not controlled under WHMIS (Canada).

Canadian lists : **CEPA Toxic substances:** None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Canada inventory : All components are listed or exempted.

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

International regulations

International lists : **Australia inventory (AICS):** Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.

Section 16. Other information

United States

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material Information System (U.S.A.) :

Health	0
Flammability	1
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of issue : 07/22/2010

Date of previous issue : 04/01/2010

Version : 1.1

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

MATERIAL SAFETY DATA SHEET**1. Product And Company Identification**

MSDS ID: MSDS501

PRODUCT NAME: Prestone® Antifreeze/Coolant

PRODUCT NUMBER: AF2004X, AF2000L, AF2050, AF2055, 72025, 71605, 71621, PRES04C

FORMULA NUMBER: YA956SY, YA956BY-B, YA956BY-ED

MANUFACTURER:
Honeywell Consumer Products Group
39 Old Ridgebury Road
Danbury, CT 06810-5109CANADIAN OFFICE:
Honeywell Consumer Products Group
3333 Unity Drive
Mississauga, Ontario L5L 3S6

INFORMATION PHONE NUMBER: (800)862-7737 (in the US) (800)668-9349 (in Canada)

EMERGENCY PHONE NUMBER: CHEMTREC (800)424-9300 (in the US) CANUTEC (613)996-6666 (in Canada)

MSDS DATE OF PREPARATION/REVISION: 11/16/06

PRODUCT USE: Automobile antifreeze – consumer product

2. Composition/Information On Ingredients

Component	CAS No.	Amount
Ethylene Glycol	107-21-1	40-60
Diethylene Glycol	111-46-6	0-5
Water	7732-18-5	>1
2-Ethyl Hexanoic Acid, Sodium Salt	19766-89-3	>1
Neodaconoic Acid, Sodium Salt	31548-27-3	>1

(See Section 8 for Exposure Limits)

3. Hazards Identification

Yellow liquid with a characteristic odor.

EMERGENCY OVERVIEW

Yellow liquid with a characteristic odor.

Eye and upper respiratory irritant. May cause nausea, vomiting, headache, drowsiness, blurred vision, convulsions, coma or death if ingested or inhaled. Prolonged or repeated skin contact may cause dermatitis or skin sensitization.

4. First Aid Measures

INHALATION: Remove the victim to fresh air. If breathing has stopped administer artificial respiration. If breathing is difficult, have medical personnel administer oxygen. Get medical attention.

SKIN CONTACT: Remove contaminated clothing. Immediately wash contacted area thoroughly with soap and water. If irritation persists, get medical attention.

EYE CONTACT: Immediately flush eyes with large amounts of water for 15 minutes. Get medical attention if irritation persists.

INGESTION: Seek immediate medical attention. Immediately call local poison control center or go to an emergency department. Never give anything by mouth to or induce vomiting in an unconscious or drowsy person.

NOTES TO PHYSICIAN: The principal toxic effects of ethylene glycol, when swallowed, are kidney damage and metabolic acidosis. The combination of metabolic acidosis, an osmol gap and oxalate crystals in the urine is evidence of ethylene glycol poisoning.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. Respiratory support with mechanical ventilation may be required.

There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth, and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing and dysphagia.

Ethanol is antidotal and its early administration may block the formation of nephrotoxic metabolites of ethylene glycol in the liver. The objective is to rapidly achieve and maintain a blood ethanol level of approximately 100 mg/dl by giving a loading dose of ethanol followed by a maintenance dose. Intravenous administration of ethanol is the preferred route. Ethanol blood levels should be checked frequently. Hemodialysis may be required.

4-Methyl pyrazole (Fomepizole®), a potent inhibitor of alcohol dehydrogenase, has been used therapeutically to decrease the metabolic consequences of ethylene glycol poisoning. Fomepizole® is easier to use clinically than ethanol, does not cause CNS depression or hypoglycemia and requires less monitoring than ethanol. Additional therapeutic modalities which may decrease the adverse consequences of ethylene glycol metabolism are the administration of both thiamine and pyridoxine. As there are complicated and serious overdoses, we recommend you consult with the toxicologists at your poison control center.

5. Firefighting Measures

FLASH POINT: 254 F (123 C) TOC >230 F (>110 C) Setaflash

AUTOIGNITION TEMPERATURE: Not determined

NFPA CLASSIFICATION: IIIB

FLAMMABILITY LIMITS: LEL: Not determined UEL: Not determined

EXTINGUISHING MEDIA: For large fires, use alcohol type or all-purpose foams. For small fires, use water spray, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Do not spray pool fires directly. Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing for fires in areas where chemicals are used or stored.

UNUSUAL FIRE HAZARDS: A solid stream of water or foam directed into hot, burning liquid can cause frothing.

HAZARDOUS COMBUSTION PRODUCTS: Burning may produce carbon monoxide and carbon dioxide.

6: Accidental Release Measures

Wear appropriate protective clothing and equipment (See Section 8). Collect with absorbent material and place in appropriate, labeled container for disposal or, if permitted flush spill area with water.

7. Handling and Storage

DANGER: Harmful or Fatal if Swallowed

Do not drink antifreeze or solution.
Avoid eye and prolonged or repeated skin contact.
Avoid breathing vapors or mists.
Wash exposed skin thoroughly with soap and water after use.
Do not store in opened or unlabeled containers.

Keep container away from open flames and excessive heat.
Do not reuse empty containers unless properly cleaned.

Empty containers retain product residue and may be dangerous. Do not cut, weld, drill, etc. containers, even empty.

Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without any obvious ignition sources. Published "autoignition" or "ignition" temperatures cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Use of this product in elevated temperature applications should be thoroughly evaluated to assure safe operating conditions.

8. Exposure Controls / Personal Protection**EXPOSURE LIMITS**

CHEMICAL	EXPOSURE LIMIT
Ethylene Glycol (as aerosol)	100 mg/m ³ Ceiling ACGIH TLV
Diethylene Glycol	None Established (PEL/TLV)
Water	None Established (PEL/TLV)
2-Ethyl Hexanoic Acid	None Established (PEL/TLV)
Neodacanoic Acid, Sodium Salt	None Established (PEL/TLV)

VENTILATION: Use general ventilation or local exhaust as required to maintain exposures below the occupational exposure limits.

RESPIRATORY PROTECTION: For operations where the TLV is exceeded a NIOSH approved respirator with organic vapor cartridges and dust/mist prefilters or supplied air respirator is recommended. Equipment selection depends on contaminant type and concentration. Select and use in accordance with 29 CFR 1910.134 and good industrial hygiene practice. For firefighting, use self-contained breathing apparatus.

GLOVES: Chemical resistant gloves such as neoprene or PVC where contact is possible.

EYE PROTECTION: Splash-proof goggles.

OTHER PROTECTIVE EQUIPMENT/CLOTHING: Appropriate protective clothing as needed to minimize skin contact.

9. Physical and Chemical Properties

APPEARANCE AND ODOR: Yellow liquid with a characteristic odor. There is no odor threshold data for this product.

pH: 8.7-9.2

BOILING POINT: 340°F (°C)

MELTING POINT: .36°F (°C)

SOLUBILITY IN WATER: Complete

PERCENT VOLATILE: Not determined

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not determined

SPECIFIC GRAVITY: 1.07-1.14

VAPOR PRESSURE: Not determined

VAPOR DENSITY: Not determined

EVAPORATION RATE: Not determined

VISCOSITY: Not determined

10. Stability and Reactivity

STABILITY: Stable

CONDITIONS TO AVOID: None

INCOMPATIBILITY: Normally unreactive, however, avoid strong bases at high temperatures, strong acids, strong oxidizing agents, and materials reactive with hydroxyl compounds.

DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

11. Toxicological Information**POTENTIAL HEALTH EFFECTS:****ACUTE HAZARDS:**

INHALATION: May cause irritation of the nose and throat with headache, particularly from mists. High vapor concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workplace, may produce nausea, vomiting, headache, dizziness and irregular eye movements.

SKIN CONTACT: No evidence of adverse effects from available information.

EYE CONTACT: Liquid, vapors or mist may cause discomfort in the eye with persistent conjunctivitis, seen as slight excess redness or conjunctiva. Serious corneal injury is not anticipated.

INGESTION: May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, malaise, blurring of vision, irritability, back pain, decrease in urine output, kidney failure, and central nervous system effects, including irregular eye movements, convulsions and coma. Cardiac failure and pulmonary edema may develop. Severe kidney damage which may be fatal may follow the swallowing of ethylene glycol. A few reports have been published describing the development of weakness of the facial muscles, diminishing hearing, and difficulty with swallowing, during the late stages of severe poisoning.

CHRONIC EFFECTS: Prolonged or repeated inhalation exposure may produce signs of central nervous system involvement, particularly dizziness and jerking eye movements. Prolonged or repeated skin contact may cause skin sensitization and an associated dermatitis in some individuals. Ethylene glycol has been found to cause birth defects in laboratory animals. The significance of this finding to humans has not been determined.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: The available toxicological information and a knowledge of the physical and chemical properties of the material suggest that overexposure is unlikely to aggravate existing medical conditions.

CARCINOGEN: None of the components of these products is listed as a carcinogen or suspected carcinogen by IARC, NTP or OSHA.

ACUTE TOXICITY VALUES:

Ethylene Glycol: LD50 Oral Rat: 4700 mg/kg
LD50 Skin Rabbit: 9530 mg/kg

Diethylene Glycol: LD50 Oral Rat: 12,565 mg/kg
LD50 Skin Rabbit: 11,890 mg/kg

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH:

Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. Also, in a preliminary study to assess the effects of exposure of pregnant rats and mice to aerosols at concentrations 150, 1,000 and 2,500 mg/m³ for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentrations, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol, percutaneous absorption of ethylene glycol from contaminated skin, or swallowing of ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1,000 and 2,500 mg/m³) and developmental toxicity with minimal evidence of teratogenicity (2,500 mg/m³). The no-effects concentration (based on maternal toxicity) was 500 mg/m³. In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to the skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen; there is currently no available information to suggest that ethylene glycol caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity; exposure to high aerosol concentration is only minimally effective in producing developmental toxicity; the major route for producing developmental toxicity is perorally.

Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence or a different pattern of tumors compared with untreated controls. The absence of carcinogenic potential for ethylene glycol has been supported by numerous invitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects. This products contains less than 0.3% tolytriazole which has demonstrates mutagenic activity in a bacterial test system. A correlation has been established between mutagenic activity and carcinogenic activity for many chemicals. Tolytriazole has not been identified as a carcinogen or probable carcinogen by NTP, IARC or OSHA.

12. Ecological Information

Ethylene Glycol: LC50 Goldfish: 5,000 mg/L/24 hr. at 20 C static conditions.

Toxicity threshold (cell multiplication inhibition test):

Bacterial (*Pseudomonas putida*): 10,000 mg/l

Protozoa (*Entosiphon sulcatum* and *Uronema parduczi*; Chatton-Lwoff): >10,000 mg/l

Algae (*Microcystis aeruginosa*): 2,000 mg/l

Green algae (*Scenedesmus quadricauda*): >10,000 mg/l

13. Disposal Considerations

Dispose of product in accordance with all local, state/provincial and federal regulations.

14. Transport Information

U.S. DOT HAZARD CLASSIFICATION: Not Regulated (unless package contains a reportable quantity)

Note: IF A SHIPMENT OF A REPORTABLE QUANTITY (5,260 LBS/553 GAL.) IN A SINGLE PACKAGE IS INVOLVED, THE FOLLOWING INFORMATION APPLIES:

PROPER SHIPPING NAME: RQ, Environmentally hazardous substance, liquid, n.o.s. (Ethylene glycol)
UN NUMBER: UN3082
PACKING GROUP: III
LABELS REQUIRED: Class 9

DOT MARINE POLLUTANTS: This product does not contain Marine Pollutants as defined in 49 CFR 171.8.

IMDG CODE SHIPPING CLASSIFICATION: Not Regulated

CANADIAN TDG CLASSIFICATION: Not Regulated

15. Regulatory Information

EPA SARA 311/312 HAZARD CLASSIFICATION: Acute health, chronic health

EPA SARA 313: This Product Contains the Following Chemicals Subject to Annual Release Reporting Requirements Under SARA Title III, Section 313 (40 CFR 372):
Ethylene Glycol 107-21-1 80-95%

PROTECTION OF STRATOSPHERIC OZONE: This product is not known to contain or to have been manufactured with ozone depleting substances as defined in 40 CFR Part 82, Appendix A to Subpart A.

CERCLA SECTION 103: Spills of this product over the RQ (reportable quantity) must be reported to the National Response Center. The RQ for this product, based on the RQ for Ethylene Glycol (95% maximum) of 5,000 lbs, is 5,260 lbs. Many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

CALIFORNIA PROPOSITION 65: The normal consumer use of this product does not result in exposures to chemicals known to the State of California to cause Cancer and/or Reproductive Harm above the significant risk level for carcinogens or the maximum allowable dose levels for reproductive toxins. Therefore, no warnings are required for consumer packages. Industrial or other occupational use of this product at higher frequency and using larger quantities of this product may result in exposures exceeding these levels and are labeled accordingly.

EPA TSCA INVENTORY: All of the components of this material are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CANADIAN ENVIRONMENTAL PROTECTION ACT: All of the ingredients are listed on the Canadian Domestic Substances List.

CANADIAN WHMIS CLASSIFICATION: Class D - Division 2 - Subdivision A - (A very toxic material causing other toxic effects)

CANADIAN WHMIS HAZARD SYMBOLS:



This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS): All of the ingredients are listed on the EINECS inventory.

JAPAN: All of the ingredients of this product are listed on the Japanese Existing and New Chemical Substances (MITI) List.

AUSTRALIA: All of the ingredients of this product are listed on the Australian Inventory of Chemical Substances.

16. Other Information

NFPA RATING (NFPA 704) - FIRE: 1 HEALTH: 2 REACTIVITY: 0

REVISION SUMMARY: All: Changed format
 Section 1: Added New Product Number

This MSDS is directed to professional users and bulk handlers of the product. Consumer products are labeled in accordance with Federal Hazardous Substances Act regulations.

While Prestone Products Corporation believes that the data contained herein are factual and the opinions expressed are those of qualified experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which Prestone Products Corporation assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.

If more information is needed, please contact:

Technical Services
Prestone Products Corporation
69 Eagle Road
Danbury CT 06810
(800)-862-7737



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[Parker Yamaha Com Home](#) > [Oils and Lubricants](#) > [Bombardier](#) > BRP XP-S 2-Stroke Synthetic Blend
Gallon 293600101

BRP XP-S 2-Stroke Synthetic Blend Gallon 293600101

MSRP: \$41.65
Web Price: \$31.99
Our Item Number: 293-600-101
Manufacturer: SeaDoo BRP
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When you don't want to spend the dollars for a full Synthetic oil, this XP-S 2-stroke **Synthetic Blend** gallon is a specially formulated high performance injection oil recommended for Bombardier any SeaDoo 2 Stroke engines and SkiDoo snowmobiles equipped with Rotax 2 TEC SDI engines. **Note** per SeaDoo this can be used in place of the fully synthetic oil if desired. This oil will also blend with existing Bombardier Synthetic or Mineral oil, allowing you to use this oil with your current SeaDoo oil without the need to drain the current SeaDoo oil. Was part number 293-600-072. Note box holds 3 gallons, priced and sold each. You can order any quantity you wish.

Related Products

[BRP Bottle Spout 414837300](#)

MSRP: \$6.75
Web Price: \$5.99
SeaDoo Bombardier Bottle Spout 414837300

[BRP XP-S Synthetic Oil Gallon](#)

MSRP: \$47.01
Web Price: \$37.99
BRP XP-S Synthetic 2 Oil Gallon

Product Reviews

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MATERIAL SAFETY DATA SHEET

SECTION I: IDENTITY

Product/Material Name: BRP XP-S Mineral Two Stroke Injection Oil

Chemical Name: Mixture

Chemical Family/Classification: Petroleum hydrocarbon

Molecular Weight: NA

Chemical Formula: NA

Material Use: Motor Oil (2-Stroke Oil)

HMIS HAZARD RATING:

[0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe]

Health: 1

Flammability: 2

Reactivity: 0

WARNING STATEMENTS (If Applicable):

CAUTION! COMBUSTIBLE LIQUID AND VAPOR. Avoid inhalation and skin contact.

MANUFACTURER'S/ SUPPLIER NAME & ADDRESS:

In the US :

BP Lubricants USA Inc.

1500 Valley Road

Wayne, NJ 07474

Telephone : (973) 633-2200

Telecopier : (973) 633-7475

In Canada :

Castrol Canada Inc.

3660 Lakeshore Blvd.

Toronto (Ontario) M8W 1P2

Telephone : (416) 252-5511

Telecopier : (416) 252-1774

In Latin America :

Castrol Latin America Lubricants

3750 NW 87th Ave., Suite 600

Miami, FL 33178

Telephone : (305) 714-2640

Telecopier : (786) 437-6380

IN THE EVENT OF AN EMERGENCY PLEASE CALL: BP Emergency Response Center 1-800-321-8642

Date Prepared/Updated: 12/10/2004

Preparer: Regulatory, Environmental, Safety Department

Telephone: (973) 633-2200

SECTION II: PRODUCT/HAZARDOUS INGREDIENT INFORMATION

INGREDIENTS - CHEMICAL/COMMON NAME	EXPOSURE LIMITS - TLV	LD ₅₀	LC ₅₀	%
Severely refined petroleum basestocks. May contain one or more of the following CASRN 72623-87-1; 64742-65-0; 64742-54-7; 64742-57-0	PEL/TWA: 5 mg/m3, mist (OSHA, ACGIH) STEL: 10 mg/m3, mist (ACGIH)	Oral, rat: > 5 g/kg	Inhalation, 4 hr., rat: > 5000 mg/m3	60-100
Petroleum distillate [CASRN 64742-47-8]	1250 mg/m3 recommended	Oral, rat: > 8000 mg/kg Dermal, rat: > 4000 mg/kg	Inhalation, 4 hr., rat: >37 ppm.	10-30
Multi-functional additive blend consisting of ashless dispersant, anti-oxidant and pour point depressant [CASRN NA, mixture]	ND	ND	ND	5-10
Dye [CASRN NA, mixture]	ND	Oral, rat: >5000 mg/kg	ND	< 0.1

NOTE:

Product contains no materials currently classified as carcinogenic per the Annual Report of the National Toxicology Program [NTP], OSHA Hazard Communication Standard or the International Agency for Research on Cancer [IARC, Groups 1, 2A or 2B].

SECTION III: FIRST AID MEASURES

Signs/Symptoms: Transient eye irritation, redness, tearing.

Eye contact: Flush with clear water for at least 15 minutes or until any irritation subsides. If irritation persists, seek medical attention.

Skin contact: Remove contaminated clothing and wash before reuse. Wipe excess material from skin. Wash exposed area with soap and water.

Inhalation: If irritation or drowsiness occur, move the person to fresh air. Administer respiratory assistance if breathing is difficult or stops; Consult a physician.

Ingestion: Give plenty of water or other mild drinkable fluids and call a physician immediately. Do not induce vomiting without express consent of medical personnel.

SECTION IV: HEALTH HAZARD DATA

Exposure Limits:

See Section II, Product/Ingredient Information.

PRIMARY ROUTES OF ENTRY:

- ☒ Eye Contact
- ☒ Skin Contact
- ☐ Skin Absorption
- ☒ Inhalation (Acute)
- ☒ Inhalation (Chronic)
- ☐ Ingestion

EFFECTS OF EXPOSURE**Acute - (Evaluation based on components and/or similar products)**

Eyes: Contact may cause mild eye irritation. Not expected to cause prolonged or significant eye irritation.

Skin: Contact may cause mild skin and irritation. Not expected to cause prolonged or significant skin irritation.

Respiratory system: Vapors or mists in excess of permissible concentrations may cause irritation of nose and throat, headache, nausea

Ingestion: Slight to moderate toxicity. Ingestion of small amounts may produce irritation and diarrhea. Ingestion of large amounts may cause generalized depression, headache, drowsiness, nausea, vomiting or diarrhea. Possible risk of aspiration of product into lungs.

Chronic -

Prolonged or repeated skin contact may cause skin drying, cracking, irritation, defatting and dermatitis. Repeated, excessive exposure to mists or fumes may induce pulmonary irritation or chronic bronchitis.

The product contains petroleum baseoils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard [29 CFR 1910.1200]. These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

Medical Conditions Generally Aggravated by Exposure: Pre-existing skin disorders.

TOXICOLOGY DATA (Product)**Acute Data (Median Lethal Dose - species)**

Oral LD₅₀ - rat: ND

Dermal LD₅₀ - rabbit: ND

Inhalation LC₅₀ - rat: ND

Irritancy Data

Eye irritation - rabbit: ND

Skin irritation - rabbit: ND

Sensitization - guinea pig: ND

Other: No data regarding presence of carcinogenicity, tetragenicity, mutagenicity, respiratory toxicity, sensitizing ability or synergistic substances.

SECTION V: EMPLOYEE PROTECTION

Ventilation:

No special ventilation is usually necessary. However, if operating conditions may create high airborne concentrations of this material, special or local ventilation may be needed.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: None required under normal use. If exposure is expected to exceed occupational exposure limits, use a NIOSH-approved respirator to prevent overexposure. In accordance with 29 CFR 1910.134, use either an atmosphere supplying respirator or an air-purifying respirator for organic vapors and particulates.

Eye: Safety goggles or glasses.

Gloves (specify): Wear oil impervious type, such as neoprene, nitrile, polyvinylchloride, to minimize skin contact.

Clothing: No special requirement; Normal work clothing. A coverall or apron may be used to minimize skin contact

Footwear: No special requirement.

Other: NA

Work/Hygienic Practices: Avoid prolonged and repeated skin contact. Do not wear contaminated clothing; Launder before reuse or discard. Wash thoroughly with soap and water after handling.

Storage/Handling: Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. Avoid breathing mist. Maintain adequate ventilation. Avoid prolonged or repeated contact with skin.

Maintain storage below 150 degrees F (66 degrees C).

SECTION VI: PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: ND

Specific Gravity (Water=1): 0.86 to 0.87

Vapor Pressure (mm.Hg. @ 25 degrees C): ND

Vapor Density (Air=1): > 1

Percent Volatiles: 10-30 %

Evaporation Rate (BuAc=1): < 1

Solubility in Water: Negligible

Freezing Point: -44 degrees F (-42 degrees C)

pH-Value: NA

Viscosity @ 40 C, cSt.: 24 - 38 typ.

Odor Threshold: ND

Coefficient of Water/Oil Distribution: ND

Appearance, Odor & Physical State: Clear, amber liquid; mild petroleum odor

SECTION VII: FIRE AND EXPLOSION DATA

FLAMMABILITY Yes [X] No [] NFPA Class IIIA material - Combustible liquid

Flash Point (PMCC): 151 degrees F (66 degrees C) min.

Fire Point (PMCC): ND

Autoignition Temperature: ND

Flammability limits in Air, % Vol.: Upper - 6.0

Lower - 1.0

Extinguishing Media:

CO₂, dry chemical, foam and water fog. Do not use water jets.

Special Firefighting Procedures/Unusual and Explosion Hazards:

Material must be preheated to burn. Do not enter confined areas without full protective equipment, including a positive pressure NIOSH approved self-contained breathing apparatus. Cool fire exposed containers with water.

EXPLOSION DATA

Sensitivity to Mechanical Impact: NA

Sensitivity to Static Discharge: NA

SECTION VIII: REACTIVITY

Stability: Stable at ambient temperatures

Hazardous Polymerization: Will not occur.

Conditions and Materials to Avoid (Incompatibilities):

Heat, open flame and oxidizing materials.

Hazardous Combustion or Decomposition Products:

Smoke, fumes, oxides of carbon

SECTION IX: ENVIRONMENTAL PROTECTION

CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300, 24 hrs. for U.S. transportation related spills, leaks, fire, exposure or accident.

Spill or Leak Procedures:

Use best engineering practices when attempting cleanup of a large spill.

Large spills - Wear respirator and protective clothing as appropriate. Remove sources of heat or ignition; Provide adequate ventilation. Stop source of leak if possible. Prevent entry into water sources. Dike and contain spill. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an inert absorbent such as clay, sand or other suitable materials; Store and dispose of properly. Where feasible and appropriate, remove contaminated soil.

Small spills - Soak up spill with an inert absorbent such as clay, sand or other suitable materials; Store in a closed container and dispose of properly. Provide adequate ventilation.

Regulatory spill reporting requirements may apply; Contact governmental agency or legal counsel for advice.

Waste Disposal Method:

If discarded as supplied, material does not meet RCRA characteristic definition of ignitability, corrosivity or reactivity and is not listed in 40 CFR 261.33. The toxicity characteristic has not been evaluated. Under RCRA, the applicable hazardous waste classification must be evaluated prior to disposal of the material. Use of the product, processing or contamination may render the resulting material hazardous.

All recovered material should be packaged, labeled, transported and disposed of or reclaimed in accordance with governmental regulations regarding air pollution, water pollution or health.

Don't pollute - Conserve Resources. Dispose of used oil properly.

CAUTION: Improper disposal or reuse of the empty container may be hazardous and illegal. Cutting or welding of empty containers may cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place. Refer to applicable governmental regulations.

SECTION X: REGULATORY INFORMATION

TRANSPORTATION

Special Shipping Information/DOT Proper Shipping Name:

When shipped in containers greater than 110 gallons US - Combustible liquid, NOS (petroleum distillates), 3, NA1993, PG III
Follow all requirements regarding transportation of a regulated material.

Not regulated under Canadian TDG Regulations

CHEMICAL CONTROL REGULATIONS:

TSCA Status: All components of this material appear on the U.S. Toxic Substance Control Act Chemical Substances Inventory.

CEPA Status: All components of this product are in compliance with chemical notification requirements under the Canadian Environmental Protection

Canadian Workplace Hazardous Material Identification System (WHMIS) Classification:

Material is a controlled product.

☐ Class A - Compressed Gas

☐ Class B-1 - Flammable Gases

☐ Class B-2 - Flammable Liquids

☒ Class B-3 - Combustible Liquids

☐ Class B-4 - Flammable Solids

☐ Class B-5 - Flammable Aerosols

☐ Class B-6 - Reactive Flammable Materials

☐ Class C - Oxidizing Material

Class D, Div.1 - Materials Causing Immediate and Serious Toxic Effects

☐ Class D-1A - Very Toxic Material

☐ Class D-1B - Toxic Material

Class D, Div.2 - Materials Causing Other Toxic Effects

☐ Class D-2A - Very Toxic Materials

☐ Class D-2B - Toxic Materials

☐ Class D-3 - Biohazardous Infectious Material

☐ Class E - Corrosive Material

☐ Class F - Dangerously Reactive Material

EPCRA - Emergency Planning and Community Right to Know Act (SARA Title III):

Section 302/304 Extremely Hazardous Substance: NA

CERCLA Section 102(a) Hazardous Substance: NA

Section 311 Hazard Category

☐ Acute (immediate)

☐ Chronic (delayed)

☒ Fire

☐ Sudden Release of Pressure

☐ Reactive

☐ Not applicable

Section 313 Toxic Release Inventory Chemical/Category:

No toxic chemical is present above de minimis quantities.

U.S. STATE RIGHT TO KNOW LAWS

New Jersey Worker and Community Right to Know Act, N.J.A.C. 8:59-5 Labelling Information: Petroleum Oil (2-Stroke Oil).

NOTICE:

The information presented herein is compiled from sources considered to be dependable, believed to be accurate to the best of BP Lubricants USA Inc. knowledge, and offered in good faith for the purpose of hazard communication. Because product use is beyond our control, no warranty is given, expressed or implied. BP Lubricants USA Inc. cannot assume any liability for the use of information contained herein. To determine applicability or effect of any law or regulation with respect to the product, users should consult a legal advisor or appropriate governmental agency.

BRP Material Safety Data Sheet

BRP Recreational Products, Inc.
565 de la montagne
Valcourt, Qc JOE 2LO

Emergency: 800-424-9300
Information: 819-566-3366

SECTION 1 CHEMICAL PRODUCT IDENTIFICATION

Product: BRP MINERAL 2T OIL
Synonyms/Other: Not applicable
Product Type: 2 cycle engine lubricant.
Preparation/Revision Date: 03/19/2009

SECTION 2 COMPOSITION INFORMATION

INGREDIENTS	CAS #	%	OSHA TWA	OSHA STEL	ACGIH TWA	SKIN
Hydrotreated light distillate	64742-47-8	25-30	Not defined	Not defined	Not defined	NO
Proprietary additives	Mixture	--	Not defined	Not defined	Not defined	NO

Comments:

TWA – Time Weighted Average is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.

STEL – Short Term Exposure Limit is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified.

SECTION 3 HAZARDOUS IDENTIFICATION

WARNING: - MAY CAUSE EYE IRRITATION
- MAY CAUSE SKIN IRRITATION
- COMBUSTIBLE

Eye contact: Direct contact may cause irritation, redness, tearing and blurred vision.

Skin contact: Avoid prolonged skin contact. This product contains materials that may cause skin irritation. Prolonged or repeated contact may result in dermatitis (dryness, chapping and reddening of skin).

Inhalation: Negligible hazard unless material is strongly heated.

Ingestion: Do not ingest. Product is expected to be relatively non-toxic unless lung aspiration occurs. Aspiration hazard is not expected due to material's heavy viscosity. Should aspiration occur, may lead to chemical pneumonitis which is characterized by pulmonary edema and hemorrhage and may be fatal. Signs of lung involvement include increased respiratory rate, increased heart rate, and a bluish discoloration of the skin. Coughing, choking and gagging are often noted at the time of aspiration. This product has laxative properties and may result in abdominal cramps and diarrhea.

Other: Not applicable.

SECTION 4 FIRST AID MEASURES

Eye contact: Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. If irritation persists seek medical attention.

Skin contact: Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If redness or irritation occurs, seek medical attention. Wash contaminated clothing before reuse.

Inhalation: If overcome by inhalation of hot vapors, remove to fresh air. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.

Ingestion: Do not induce vomiting unless directed by a physician. During vomiting there is a danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. Keep affected person warm and at rest. Seek immediate medical attention.

BRP Material Safety Data Sheet

Other: Not applicable.

SECTION 5 FIRE FIGHTING MEASURES

Flash point: 64 °C (ASTM D56-tag closed cup)
Flammable limits: Not determined.
Extinguishing media: Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.
Special firefighting procedures: Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible (safely). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Fire fighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.
Unusual fire & explosion hazards: Dense smoke may be generated while burning. Toxic fumes, gases or vapors may evolve on burning. High temperatures may create heavy flammable vapors that may settle along ground level and low spots to create an invisible fire hazard.
Byproducts of combustion: Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen, and sulfur; reactive hydrocarbons and irritating vapors.
Autoignition temperature: Not determined.
Explosion data: Not determined. Care should always be exercised in dust/mist areas.
Other: When tested via ASTM D4206 this product does not sustain combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill control procedures (land): Immediately turn off or isolate any source of ignition (pilot lights, electrical equipment, flames, heaters, etc.). Evacuate area and ventilate. Personnel wearing proper protective equipment should contain spill immediately with inert materials (sand, earth, chemical spill pads of cotton) by forming dikes. Dikes should be placed to contain spill in a manner that will prevent material from entering sewers and waterways. Large spill, once contained, may be picked up using explosion proof, non-sparking vacuum pumps, shovels, or buckets, and disposed of in suitable containers for disposal. If a large spill occurs notify appropriate authorities. In case of road spill or accident contact Chem-Trec (800-424-9300).
Spill control procedures (water): Try to contain large spills with floating booms to prevent spill from spreading. Remove from surface by skimming or with suitable adsorbents. If a large spill occurs notify appropriate authorities (normally the National Response Center or Coast Guard at 800-424-8802).
Waste disposal method: Most oil based products are incinerated, land-filled or reclaimed. All disposals must comply with federal, state, and local regulations. The material, if spilled or discarded may be a regulated waste. Refer to state and local regulations. Department of Transportation (DOT) regulations may apply for transporting this material when spilled. See Section 14.
Other: CAUTION - If spilled material is cleaned up using a regulated solvent, the resulting waste mixture will be regulated.

SECTION 7 HANDLING AND STORAGE

BRP Material Safety Data Sheet

Handling procedures:	Keep containers closed when not in use. Do not transfer to unmarked containers. Fire extinguishers should be kept readily available. See NFPA 30 and OSHA 1910.106 -- Flammable and Combustible Liquids. Empty containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld, or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.
Storage procedures:	Store containers away from heat, sparks, open flame, or oxidizing materials.
Additional information:	No additional information.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection:	Applicable mainly to persons in repeated contact situations such as packaging of product, service/maintenance, and cleanup/spill control personnel.
Respiratory protection:	None required if airborne concentrations are maintained below threshold limits listed on page one. Otherwise a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed. Where misting may occur, wear an MSHA/NIOSH approved (or equivalent) half-mask form dust/mist air purifying respirator.
Eye protection:	Eye protection is not required if material is used for the intended purpose. If material is handled such that it could be splashed into the eyes - or there is any concern, wear safety glasses with side shields or vented/splash proof goggles (ANSI Z87.1 or approved equivalent).
Hand protection:	Impervious gloves such as neoprene or nitrile rubber to avoid skin sensitization and absorption.
Other protection:	Use of an apron and overboots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization and absorption. Launder soiled clothes. Properly dispose of contaminated leather articles and other materials which cannot be decontaminated.
Local control measures:	Use adequate ventilation when working with material in an enclosed area. Mechanical methods such as fume hoods or area fans may be used to reduce localized vapor/mist areas. If vapor or mist is generated when the material handled, adequate ventilation in accordance with good engineering practice must be provided to maintain concentrations below the specified exposure. Eyewash stations and showers should be available in areas where this material is used and stored.
Other:	Consumption of food and drink should be avoided in work areas where product is present. Always wash hands and face with soap and water before eating, drinking or smoking.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Vapor pressure:	Not determined.
Specific gravity:	Approximately 0.865 at 15.6°C (60.0°F).
Solubility:	Negligible in water, miscible in most petroleum solvents.
Percent volatile:	Not determined.
Vapor density (air=1):	>1.
Evaporation rate (n-Butyl Acetate=1):	Not determined.
Odor:	Mild, oily odor.
Appearance:	Amber fluid
Viscosity:	Approximately 6.69 cSt at 100°C (212°F).
Boiling point:	Not determined.
Pour/Freeze point:	Not determined.
Other:	Not applicable.

SECTION 10 STABILITY AND REACTIVITY

Stability:	Material is stable at room temperatures and pressure.
Conditions to avoid:	Avoid high temperatures and product contamination.
Incompatibility with	

BRP Material Safety Data Sheet

other materials:	Avoid contact with acids and oxidizing materials.
Decomposition products:	Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen and sulfur; reactive hydrocarbons and irritating vapors.
Hazardous polymerization:	Will not occur.
Other:	Not applicable.

SECTION 11 TOXICOLOGICAL INFORMATION

Oral toxicity:	Not determined.
Dermal toxicity:	Not determined.
Inhalation toxicity:	On rare occasions, prolonged and repeated exposure to oil mist poses a risk of pulmonary disease such as chronic lung inflammation. This condition is usually asymptomatic as a result of repeated small aspirations. Shortness of breath and cough are the most common symptoms. Based on data from similar materials.
Dermal sensitization:	Prolonged or repeated contact may make skin more sensitive to other skin sensitizers. Based on data from similar materials.
Chronic toxicity:	Not determined.
Carcinogenicity:	Not determined.
Mutagenicity:	Not determined.
Reproductive toxicity:	Not determined.
Other:	These products contain petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

SECTION 12 ECOLOGICAL INFORMATION

Environmental toxicity:	Not determined. However, this material may be toxic to aquatic organisms and should be kept out of sewage and drainage systems and all bodies of water.
Environmental fate:	Not determined.
Other:	Not applicable.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste disposal:	Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. This product unadulterated by other materials may be classified as a non-regulated waste in some areas - but still needs to be disposed of at approved facilities. Waste management should be in full compliance with federal, state, and local laws.
Disposal consideration:	Most used and non-use oils and solvents are incinerated by licensed burner facilities for heat value, or reclaimed by oil recycling services. Look in a local telephone directory or internet for headings under, 'Waste', 'Waste Services', 'Waste Disposal' for companies licensed to handle such material. Additional information can be obtained from local EPA, DNR, Sewer and Land-Fill sites. Unused, packaged fluids may be donated to other companies or charities (fluids MUST be unused).
Other:	The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can only occur in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state, and local

BRP Material Safety Data Sheet

regulations.

SECTION 14

TRANSPORT INFORMATION

U.S. DOT shipping

description:

Not regulated by DOT.

IMDG:

Not regulated

IATA:

Not regulated

SECTION 15

REGULATORY INFORMATION

Clean water act/oil pollution act:

Under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Control Act of 1990, this material is considered an oil. Any spill or discharges that produce a visible sheen or film on surface of water, or in waterways, ditches, or sewers leading to surface water must be reported. Contact the National Response Center at 800-424-8802.

TSCA:

All components of this material are listed in the U.S. TSCA Inventory.

Other TSCA:

Not applicable.

SARA Title III:

Section 302/304 extremely hazardous substances:

There are no components present at or greater than the de minimis concentration

Section 311, 312 hazard categorization:

Acute (immediate health effects): NO

Chronic (delayed health effects): NO

Fire (hazard): NO

Reactivity (hazard): NO

Pressure (sudden release hazard): NO

Section 313 toxic chemicals:

There are no components present at or greater than the de minimis concentration.

CERCLA:

For stationary/moving sources – reportable quantity (due to):

Exempt due to petroleum exclusion.

Other:

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. However, releases may be reportable to the Nation Response Center under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5) - see head of Section 15. Failure to report may result in substantial civil and criminal penalties.

Recommend contacting the local authorities in the event of any type of spill to determine local reporting requirements and also to aid in the cleanup.

SECTION 16

OTHER INFORMATION

	NFPA 704	KEY
HEALTH:	1	0 = Minimal
FIRE:	2	1 = Slight
REACTIVITY:	0	2 = Moderate
SPECIFIC HAZARD:	NONE	3 = Serious
PROTECTION INDEX:	N/A	4 = Severe

This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used. BRP must rely on information provided by those materials manufacturers or distributors.

Creation date:

10/03/2007

File:

BRP Mineral 2T Oil (2225)

Version:

III

BRP Material Safety Data Sheet

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Revisions / Comments:

Revised Sections: 5, 14 03/19/2009

BRP Material Safety Data Sheet

BRP Recreational Products, Inc.
565 de la montagne
Valcourt, Qc JOE 2LO

Emergency: 800-424-9300

Information: 819-566-3366

SECTION 1 CHEMICAL PRODUCT IDENTIFICATION

Product: BRP NORDTRAC XPS SEMI-SYNTHETIC 2 STROKE OIL
Synonyms/Other: T13569A
MSDS CODE : 10252
Product Type: 2 cycle engine lubricant.
Preparation/Revision Date: 07/20/2009

SECTION 2 COMPOSITION INFORMATION

INGREDIENTS	CAS #	%	OSHA TWA	OSHA STEL	ACGIH TWA	SKIN
Hydrotreated light distillate	64742-47-8	20-30	Not defined	Not defined	Not defined	NO
Proprietary additives	Mixture	--	Not defined	Not defined	Not defined	NO

Comments:

TWA – Time Weighted Average is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.

STEL – Short Term Exposure Limit is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified.

SECTION 3 HAZARDOUS IDENTIFICATION

WARNING:
- MAY CAUSE EYE IRRITATION
- MAY CAUSE SKIN IRRITATION

Eye contact: Direct contact may cause irritation, redness, tearing and blurred vision.
Skin contact: Avoid prolonged skin contact. This product contains materials that may cause skin irritation. Prolonged or repeated contact may result in dermatitis (dryness, chapping and reddening of skin).

Inhalation: Negligible hazard unless material is strongly heated.
Ingestion: Do not ingest. Product is expected to be relatively non-toxic unless lung aspiration occurs. Aspiration hazard is not expected due to material's heavy viscosity. Should aspiration occur, may lead to chemical pneumonitis which is characterized by pulmonary edema and hemorrhage and may be fatal. Signs of lung involvement include increased respiratory rate, increased heart rate, and a bluish discoloration of the skin. Coughing, choking and gagging are often noted at the time of aspiration. This product has laxative properties and may result in abdominal cramps and diarrhea.

Other: Not applicable.

SECTION 4 FIRST AID MEASURES

Eye contact: Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. If irritation persists seek medical attention.

Skin contact: Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If redness or irritation occurs, seek medical attention. Wash contaminated clothing before reuse.

Inhalation: If overcome by inhalation of hot vapors, remove to fresh air. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.

Ingestion: Do not induce vomiting unless directed by a physician. During vomiting there is a danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. Keep affected person warm and at rest. Seek immediate medical attention.

BRP Material Safety Data Sheet

Other: Not applicable.

SECTION 5 FIRE FIGHTING MEASURES

Flash point:	61°C (ASTM D56 –tag closed cup)
Flammable limits:	Not determined.
Extinguishing media:	Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.
Special firefighting procedures:	<p>Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.</p> <p>Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible (safely). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.</p> <p>Fire fighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.</p>
Unusual fire & explosion hazards:	Dense smoke may be generated while burning. Toxic fumes, gases or vapors may evolve on burning. High temperatures may create heavy flammable vapors that may settle along ground level and low spots to create an invisible fire hazard.
Byproducts of combustion:	Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen, and sulfur; reactive hydrocarbons and irritating vapors.
Autoignition temperature:	Not determined.
Explosion data:	Not determined. Care should always be exercised in dust/mist areas.
Other:	When tested via ASTM D4206 this product does not sustain combustion

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill control procedures (land):	Immediately turn off or isolate any source of ignition (pilot lights, electrical equipment, flames, heaters, etc.). Evacuate area and ventilate. Personnel wearing proper protective equipment should contain spill immediately with inert materials (sand, earth, chemical spill pads of cotton) by forming dikes. Dikes should be placed to contain spill in a manner that will prevent material from entering sewers and waterways. Large spill, once contained, may be picked up using explosion proof, non-sparking vacuum pumps, shovels, or buckets, and disposed of in suitable containers for disposal. If a large spill occurs notify appropriate authorities. In case of road spill or accident contact Chem-Trec (800-424-9300).
Spill control procedures (water):	Try to contain large spills with floating booms to prevent spill from spreading. Remove from surface by skimming or with suitable adsorbents. If a large spill occurs notify appropriate authorities (normally the National Response Center or Coast Guard at 800-424-8802).
Waste disposal method:	Most oil based products are incinerated, land-filled or reclaimed. All disposals must comply with federal, state, and local regulations. The material, if spilled or discarded may be a regulated waste. Refer to state and local regulations. Department of Transportation (DOT) regulations may apply for transporting this material when spilled. See Section 14.
Other:	CAUTION - If spilled material is cleaned up using a regulated solvent, the resulting waste mixture will be regulated.

SECTION 7 HANDLING AND STORAGE

BRP Material Safety Data Sheet

Handling procedures:	Keep containers closed when not in use. Do not transfer to unmarked containers. Fire extinguishers should be kept readily available. See NFPA 30 and OSHA 1910.106 -- Flammable and Combustible Liquids. Empty containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld, or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.
Storage procedures:	Store containers away from heat, sparks, open flame, or oxidizing materials.
Additional information:	No additional information.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection:	Applicable mainly to persons in repeated contact situations such as packaging of product, service/maintenance, and cleanup/spill control personnel.
Respiratory protection:	None required if airborne concentrations are maintained below threshold limits listed on page one. Otherwise a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed. Where misting may occur, wear an MSHA/NIOSH approved (or equivalent) half-mask form dust/mist air purifying respirator.
Eye protection:	Eye protection is not required if material is used for the intended purpose. If material is handled such that it could be splashed into the eyes - or there is any concern, wear safety glasses with side shields or vented/splash proof goggles (ANSI Z87.1 or approved equivalent).
Hand protection:	Impervious gloves such as neoprene or nitrile rubber to avoid skin sensitization and absorption.
Other protection:	Use of an apron and overboots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization and absorption. Launder soiled clothes. Properly dispose of contaminated leather articles and other materials which cannot be decontaminated.
Local control measures:	Use adequate ventilation when working with material in an enclosed area. Mechanical methods such as fume hoods or area fans may be used to reduce localized vapor/mist areas. If vapor or mist is generated when the material handled, adequate ventilation in accordance with good engineering practice must be provided to maintain concentrations below the specified exposure. Eyewash stations and showers should be available in areas where this material is used and stored.
Other:	Consumption of food and drink should be avoided in work areas where product is present. Always wash hands and face with soap and water before eating, drinking or smoking.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Vapor pressure:	Not determined.
Specific gravity:	Approximately 0.88 at 15.6°C (60.0°F).
Solubility:	Negligible in water, miscible in most petroleum solvents.
Percent volatile:	Not determined.
Vapor density (air=1):	>1.
Evaporation rate (n-Butyl Acetate=1):	Not determined.
Odor:	Mild, oily odor.
Appearance:	Dark fluid
Viscosity:	Approximately 7.0 cSt at 100°C (212°F).
Boiling point:	Not determined.
Pour/Freeze point:	Not determined.
Other:	Not applicable.

SECTION 10 STABILITY AND REACTIVITY

Stability:	Material is stable at room temperatures and pressure.
Conditions to avoid:	Avoid high temperatures and product contamination.
Incompatibility with	

BRP Material Safety Data Sheet

other materials:	Avoid contact with acids and oxidizing materials.
Decomposition products:	Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen and sulfur; reactive hydrocarbons and irritating vapors.
Hazardous polymerization:	Will not occur.
Other:	Not applicable.

SECTION 11 TOXICOLOGICAL INFORMATION

Oral toxicity:	Not determined.
Dermal toxicity:	Not determined.
Inhalation toxicity:	On rare occasions, prolonged and repeated exposure to oil mist poses a risk of pulmonary disease such as chronic lung inflammation. This condition is usually asymptomatic as a result of repeated small aspirations. Shortness of breath and cough are the most common symptoms. Based on data from similar materials.
Dermal sensitization:	Prolonged or repeated contact may make skin more sensitive to other skin sensitizers. Based on data from similar materials.
Chronic toxicity:	Not determined.
Carcinogenicity:	Not determined.
Mutagenicity:	Not determined.
Reproductive toxicity:	Not determined.
Other:	These products contain petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

SECTION 12 ECOLOGICAL INFORMATION

Environmental toxicity:	Not determined. However, this material may be toxic to aquatic organisms and should be kept out of sewage and drainage systems and all bodies of water.
Environmental fate:	Not determined.
Other:	Not applicable.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste disposal:	Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. This product unadulterated by other materials may be classified as a non-regulated waste in some areas - but still needs to be disposed of at approved facilities. Waste management should be in full compliance with federal, state, and local laws.
Disposal consideration:	Most used and non-use oils and solvents are incinerated by licensed burner facilities for heat value, or reclaimed by oil recycling services. Look in a local telephone directory or internet for headings under, 'Waste', 'Waste Services', 'Waste Disposal' for companies licensed to handle such material. Additional information can be obtained from local EPA, DNR, Sewer and Land-Fill sites. Unused, packaged fluids may be donated to other companies or charities (fluids MUST be unused).
Other:	The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can only occur in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state, and local

BRP Material Safety Data Sheet

regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT identification:

Not regulated

IMDG:

Not regulated

IATA:

Not regulated

SECTION 15 REGULATORY INFORMATION

Clean water act/oil pollution act:

Under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Control Act of 1990, this material is considered an oil. Any spill or discharges that produce a visible sheen or film on surface of water, or in waterways, ditches, or sewers leading to surface water must be reported. Contact the National Response Center at 800-424-8802.

TSCA:

All components of this material are listed in the U.S. TSCA Inventory.

Other TSCA:

Not applicable.

SARA Title III:

Section 302/304 extremely hazardous substances:

There are no components present at or greater than the de minimis concentration

Section 311, 312 hazard categorization:

Acute (immediate health effects): NO

Chronic (delayed health effects): NO

Fire (hazard): NO

Reactivity (hazard): NO

Pressure (sudden release hazard): NO

Section 313 toxic chemicals:

There are no components present at or greater than the de minimis concentration.

CERCLA:

For stationary/moving sources – reportable quantity (due to):

Exempt due to petroleum exclusion.

Other:

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. However, releases may be reportable to the Nation Response Center under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5) - see head of Section 15. Failure to report may result in substantial civil and criminal penalties.

Recommend contacting the local authorities in the event of any type of spill to determine local reporting requirements and also to aid in the cleanup.

SECTION 16 OTHER INFORMATION

	NFPA 704	KEY
HEALTH:	1	0 = Minimal
FIRE:	2	1 = Slight
REACTIVITY:	0	2 = Moderate
SPECIFIC HAZARD:	NONE	3 = Serious
PROTECTION INDEX:	N/A	4 = Severe

This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used. BRP must rely on information provided by those materials manufacturers or distributors.

Creation date: 09/17/2007

File: BRP Semi-Synthetic 2 Cycle Oil (10252)

Version: VI

INFORMATION PROVIDED IN THIS MSDS IS CONSIDERED ACCURATE AND RELIABLE BASED ON INFORMATION ISSUED FROM INTERNAL AND

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Revisions / Comments:

Updated section 14: 04/04/2008

Updated section 14: 06/17/2008

Updated Section 1: Altered product name (added XPS to name)

Updated Section: 3, 5,14 02/27/2009

Updated Section: 1 Item numbers removed code added 07/20/2009

BRP Material Safety Data Sheet

BRP Recreational Products, Inc.
565 de la montagne
Valcourt, Qc JOE 2LO

Emergency: 800-424-9300
Information: 819-566-3366

SECTION 1 CHEMICAL PRODUCT IDENTIFICATION

Product: BRP SYNTHETIC 2 CYCLE OIL
Synonyms/Other: LTX T13871
Item Number(s): T13871
Product Type: 2 cycle engine lubricant.
Preparation/Revision Date: 03/19/2009

SECTION 2 COMPOSITION INFORMATION

INGREDIENTS	CAS #	%	OSHA TWA	OSHA STEL	ACGIH TWA	SKIN
Hydrotreated light distillate	64742-47-8	20-30	Not defined	Not defined	Not defined	NO
Proprietary additives	Mixture	--	Not defined	Not defined	Not defined	NO

Comments:

TWA – Time Weighted Average is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.

STEL – Short Term Exposure Limit is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified.

SECTION 3 HAZARDOUS IDENTIFICATION

WARNING:
- MAY CAUSE EYE IRRITATION
- MAY CAUSE SKIN IRRITATION

Eye contact: Direct contact may cause irritation, redness, tearing and blurred vision.
Skin contact: Avoid prolonged skin contact. This product contains materials that may cause skin irritation. Prolonged or repeated contact may result in dermatitis (dryness, chapping and reddening of skin).

Inhalation: Negligible hazard unless material is strongly heated.
Ingestion: Do not ingest. Product is expected to be relatively non-toxic unless lung aspiration occurs. Aspiration hazard is not expected due to material's heavy viscosity. Should aspiration occur, may lead to chemical pneumonitis which is characterized by pulmonary edema and hemorrhage and may be fatal. Signs of lung involvement include increased respiratory rate, increased heart rate, and a bluish discoloration of the skin. Coughing, choking and gagging are often noted at the time of aspiration. This product has laxative properties and may result in abdominal cramps and diarrhea.

Other: Not applicable.

SECTION 4 FIRST AID MEASURES

Eye contact: Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. If irritation persists seek medical attention.

Skin contact: Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If redness or irritation occurs, seek medical attention. Wash contaminated clothing before reuse.

Inhalation: If overcome by inhalation of hot vapors, remove to fresh air. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.

Ingestion: Do not induce vomiting unless directed by a physician. During vomiting there is a danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. Keep affected person warm.

BRP Material Safety Data Sheet

Other: and at rest. Seek immediate medical attention.
Not applicable.

SECTION 5 FIRE FIGHTING MEASURES

Flash point: 65 °C (ASTM D56-tag closed cup)
Flammable limits: Not determined.
Extinguishing media: Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.
Special firefighting procedures: Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.
Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible (safely). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.
Fire fighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.
Unusual fire & explosion hazards: Dense smoke may be generated while burning. Toxic fumes, gases or vapors may evolve on burning. High temperatures may create heavy flammable vapors that may settle along ground level and low spots to create an invisible fire hazard.
Byproducts of combustion: Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen, and sulfur; reactive hydrocarbons and irritating vapors.
Autoignition temperature: Not determined.
Explosion data: Not determined. Care should always be exercised in dust/mist areas.
Other: When tested via ASTM D4206 this product does not sustain combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill control procedures (land): Immediately turn off or isolate any source of ignition (pilot lights, electrical equipment, flames, heaters, etc.). Evacuate area and ventilate. Personnel wearing proper protective equipment should contain spill immediately with inert materials (sand, earth, chemical spill pads of cotton) by forming dikes. Dikes should be placed to contain spill in a manner that will prevent material from entering sewers and waterways. Large spill, once contained, may be picked up using explosion proof, non-sparking vacuum pumps, shovels, or buckets, and disposed of in suitable containers for disposal. If a large spill occurs notify appropriate authorities. In case of road spill or accident contact Chem-Trec (800-424-9300).
Spill control procedures (water): Try to contain large spills with floating booms to prevent spill from spreading. Remove from surface by skimming or with suitable adsorbents. If a large spill occurs notify appropriate authorities (normally the National Response Center or Coast Guard at 800-424-8802).
Waste disposal method: Most oil based products are incinerated, land-filled or reclaimed. All disposals must comply with federal, state, and local regulations. The material, if spilled or discarded may be a regulated waste. Refer to state and local regulations. Department of Transportation (DOT) regulations may apply for transporting this material when spilled. See Section 14.
Other: CAUTION - If spilled material is cleaned up using a regulated solvent, the resulting waste mixture will be regulated.

BRP Material Safety Data Sheet

SECTION 7 HANDLING AND STORAGE

Handling procedures:	Keep containers closed when not in use. Do not transfer to unmarked containers. Fire extinguishers should be kept readily available. See NFPA 30 and OSHA 1910.106 -- Flammable and Combustible Liquids. Empty containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld, or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.
Storage procedures:	Store containers away from heat, sparks, open flame, or oxidizing materials.
Additional information:	No additional information.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection:	Applicable mainly to persons in repeated contact situations such as packaging of product, service/maintenance, and cleanup/spill control personnel.
Respiratory protection:	None required if airborne concentrations are maintained below threshold limits listed on page one. Otherwise a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed. Where misting may occur, wear an MSHA/NIOSH approved (or equivalent) half-mask form dust/mist air purifying respirator.
Eye protection:	Eye protection is not required if material is used for the intended purpose. If material is handled such that it could be splashed into the eyes - or there is any concern, wear safety glasses with side shields or vented/splash proof goggles (ANSI Z87.1 or approved equivalent).
Hand protection:	Impervious gloves such as neoprene or nitrile rubber to avoid skin sensitization and absorption.
Other protection:	Use of an apron and overboots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization and absorption. Launder soiled clothes. Properly dispose of contaminated leather articles and other materials which cannot be decontaminated.
Local control measures:	Use adequate ventilation when working with material in an enclosed area. Mechanical methods such as fume hoods or area fans may be used to reduce localized vapor/mist areas. If vapor or mist is generated when the material handled, adequate ventilation in accordance with good engineering practice must be provided to maintain concentrations below the specified exposure. Eyewash stations and showers should be available in areas where this material is used and stored.
Other:	Consumption of food and drink should be avoided in work areas where product is present. Always wash hands and face with soap and water before eating, drinking or smoking.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Vapor pressure:	Not determined.
Specific gravity:	Approximately 0.88 at 15.6°C (60.0°F).
Solubility:	Negligible in water, miscible in most petroleum solvents.
Percent volatile:	Not determined.
Vapor density (air=1):	>1.
Evaporation rate (n-Butyl Acetate=1):	Not determined.
Odor:	Mild, oily odor.
Appearance:	Dark fluid
Viscosity:	Approximately 7.0 cSt at 100°C (212°F).
Boiling point:	Not determined.
Pour/Freeze point:	Not determined.
Other:	Not applicable.

SECTION 10 STABILITY AND REACTIVITY

Stability:	Material is stable at room temperatures and pressure.
Conditions to avoid:	Avoid high temperatures and product contamination.

BRP Material Safety Data Sheet

Incompatibility with other materials:
Decomposition products:

Avoid contact with acids and oxidizing materials.

Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen and sulfur; reactive hydrocarbons and irritating vapors.

Hazardous polymerization:
Other:

Will not occur.

Not applicable.

SECTION 11

TOXICOLOGICAL INFORMATION

Oral toxicity:

Not determined.

Dermal toxicity:

Not determined.

Inhalation toxicity:

On rare occasions, prolonged and repeated exposure to oil mist poses a risk of pulmonary disease such as chronic lung inflammation. This condition is usually asymptomatic as a result of repeated small aspirations. Shortness of breath and cough are the most common symptoms. Based on data from similar materials.

Dermal sensitization:

Prolonged or repeated contact may make skin more sensitive to other skin sensitizers. Based on data from similar materials.

Chronic toxicity:

Not determined.

Carcinogenicity:

Not determined.

Mutagenicity:

Not determined.

Reproductive toxicity:

Not determined.

Other:

These products contain petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

SECTION 12

ECOLOGICAL INFORMATION

Environmental toxicity:

Not determined. However, this material may be toxic to aquatic organisms and should be kept out of sewage and drainage systems and all bodies of water.

Environmental fate:

Not determined.

Other:

Not applicable.

SECTION 13

DISPOSAL CONSIDERATIONS

Waste disposal:

Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. This product unadulterated by other materials may be classified as a non-regulated waste in some areas - but still needs to be disposed of at approved facilities. Waste management should be in full compliance with federal, state, and local laws.

Disposal consideration:

Most used and non-use oils and solvents are incinerated by licensed burner facilities for heat value, or reclaimed by oil recycling services. Look in a local telephone directory or internet for headings under, 'Waste', 'Waste Services', 'Waste Disposal' for companies licensed to handle such material. Additional information can be obtained from local EPA, DNR, Sewer and Land-Fill sites. Unused, packaged fluids may be donated to other companies or charities (fluids MUST be unused).

Other:

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can only occur in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of

BRP Material Safety Data Sheet

this material must be conducted in compliance with all federal, state, and local regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT identification: Not DOT Regulated
IMDG: Not regulated
IATA: Not regulated

SECTION 15 REGULATORY INFORMATION

Clean water act/oil pollution act:

Under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Control Act of 1990, this material is considered an oil. Any spill or discharges that produce a visible sheen or film on surface of water, or in waterways, ditches, or sewers leading to surface water must be reported. Contact the National Response Center at 800-424-8802.

TSCA:

All components of this material are listed in the U.S. TSCA Inventory.

Other TSCA:

Not applicable.

SARA Title III:

Section 302/304 extremely hazardous substances:

There are no components present at or greater than the de minimis concentration

Section 311, 312 hazard categorization:

Acute (immediate health effects): NO

Chronic (delayed health effects): NO

Fire (hazard): NO

Reactivity (hazard): NO

Pressure (sudden release hazard): NO

Section 313 toxic chemicals:

There are no components present at or greater than the de minimis concentration.

CERCLA:

For stationary/moving sources – reportable quantity (due to):

Exempt due to petroleum exclusion.

Other:

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. However, releases may be reportable to the Nation Response Center under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5) - see head of Section 15. Failure to report may result in substantial civil and criminal penalties.

Recommend contacting the local authorities in the event of any type of spill to determine local reporting requirements and also to aid in the cleanup.

SECTION 16 OTHER INFORMATION

	NFPA 704	KEY
HEALTH:	1	0 = Minimal
FIRE:	2	1 = Slight
REACTIVITY:	0	2 = Moderate
SPECIFIC HAZARD:	NONE	3 = Serious
PROTECTION INDEX:	N/A	4 = Severe

This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used. BRP must rely on information provided by those materials manufacturers or distributors.

Creation date: 08/27/2008
File: BRP Synthetic 2 Cycle Oil LTX T13871
Version: III

BRP Material Safety Data Sheet

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Revisions / Comments:

Revised sections: 3,14,

Revised section: 14

Lubrication Technologies Material Safety Data Sheet

Lubrication Technologies, Inc.
900 Mendelssohn Avenue North
Golden Valley, MN
55427-4309

Emergency(24 hr): 800-424-9300

Fax: 763-545-9256
Information: 763-545-0707

SECTION 1 CHEMICAL PRODUCT IDENTIFICATION

Product: Rotax Kart Semi-Synthetic 2-T Premix Oil
Synonyms/Other: T16018
MSDS Number: 10251
Product Type: 2 cycle engine lubricant.
Preparation/Revision Date: 10/14/2009

SECTION 2 COMPOSITION INFORMATION

INGREDIENTS	CAS #	%	OSHA TWA	OSHA STEL	ACGIH TWA	SKIN
Hydrotreated light distillate	64742-47-8	20-30	Not defined	Not defined	Not defined	NO
Proprietary additives	Mixture	--	Not defined	Not defined	Not defined	NO

Comments:

TWA – Time Weighted Average is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.

STEL – Short Term Exposure Limit is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified.

SECTION 3 HAZARDOUS IDENTIFICATION

WARNING:
- MAY CAUSE EYE IRRITATION
- MAY CAUSE SKIN IRRITATION

Eye contact: Direct contact may cause irritation, redness, tearing and blurred vision.
Skin contact: Avoid prolonged skin contact. This product contains materials that may cause skin irritation. Prolonged or repeated contact may result in dermatitis (dryness, chapping and reddening of skin).

Inhalation: Negligible hazard unless material is strongly heated.
Ingestion: Do not ingest. Product is expected to be relatively non-toxic unless lung aspiration occurs. Aspiration hazard is not expected due to material's heavy viscosity. Should aspiration occur, may lead to chemical pneumonitis which is characterized by pulmonary edema and hemorrhage and may be fatal. Signs of lung involvement include increased respiratory rate, increased heart rate, and a bluish discoloration of the skin. Coughing, choking and gagging are often noted at the time of aspiration. This product has laxative properties and may result in abdominal cramps and diarrhea.

Other: Not applicable.

SECTION 4 FIRST AID MEASURES

Eye contact: Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. If irritation persists seek medical attention.

Skin contact: Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If redness or irritation occurs, seek medical attention. Wash contaminated clothing before reuse.

Inhalation: If overcome by inhalation of hot vapors, remove to fresh air. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.

Ingestion: Do not induce vomiting unless directed by a physician. During vomiting there is a danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. Keep affected person warm.

Lubrication Technologies Material Safety Data Sheet

Other: and at rest. Seek immediate medical attention.
Not applicable.

SECTION 5 FIRE FIGHTING MEASURES

Flash point: 80°C (ASTM D92- Cleveland Open Cup)
Flammable limits: Not determined.
Extinguishing media: Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.

Special firefighting procedures: Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible (safely). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Fire fighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

Unusual fire & explosion hazards: Dense smoke may be generated while burning. Toxic fumes, gases or vapors may evolve on burning. High temperatures may create heavy flammable vapors that may settle along ground level and low spots to create an invisible fire hazard.

Byproducts of combustion: Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen, and sulfur; reactive hydrocarbons and irritating vapors.

Autoignition temperature: Not determined.
Explosion data: Not determined. Care should always be exercised in dust/mist areas.
Other: When tested via ASTM D4206 this product does not sustain combustion

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill control procedures (land): Immediately turn off or isolate any source of ignition (pilot lights, electrical equipment, flames, heaters, etc.). Evacuate area and ventilate. Personnel wearing proper protective equipment should contain spill immediately with inert materials (sand, earth, chemical spill pads of cotton) by forming dikes. Dikes should be placed to contain spill in a manner that will prevent material from entering sewers and waterways. Large spill, once contained, may be picked up using explosion proof, non-sparking vacuum pumps, shovels, or buckets, and disposed of in suitable containers for disposal. If a large spill occurs notify appropriate authorities. In case of road spill or accident contact Chem-Trec (800-424-9300).

Spill control procedures (water): Try to contain large spills with floating booms to prevent spill from spreading. Remove from surface by skimming or with suitable adsorbents. If a large spill occurs notify appropriate authorities (normally the National Response Center or Coast Guard at 800-424-8802).

Waste disposal method: Most oil based products are incinerated, land-filled or reclaimed. All disposals must comply with federal, state, and local regulations. The material, if spilled or discarded may be a regulated waste. Refer to state and local regulations. Department of Transportation (DOT) regulations may apply for transporting this material when spilled. See Section 14.

Other: CAUTION - If spilled material is cleaned up using a regulated solvent, the resulting waste mixture will be regulated.

Lubrication Technologies Material Safety Data Sheet

SECTION 7 HANDLING AND STORAGE

Handling procedures:	Keep containers closed when not in use. Do not transfer to unmarked containers. Fire extinguishers should be kept readily available. See NFPA 30 and OSHA 1910.106 -- Flammable and Combustible Liquids. Empty containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld, or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.
Storage procedures:	Store containers away from heat, sparks, open flame, or oxidizing materials.
Additional information:	No additional information.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protection:	Applicable mainly to persons in repeated contact situations such as packaging of product, service/maintenance, and cleanup/spill control personnel.
Respiratory protection:	None required if airborne concentrations are maintained below threshold limits listed on page one. Otherwise a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed. Where misting may occur, wear an MSHA/NIOSH approved (or equivalent) half-mask form dust/mist air purifying respirator.
Eye protection:	Eye protection is not required if material is used for the intended purpose. If material is handled such that it could be splashed into the eyes - or there is any concern, wear safety glasses with side shields or vented/splash proof goggles (ANSI Z87.1 or approved equivalent).
Hand protection:	Impervious gloves such as neoprene or nitrile rubber to avoid skin sensitization and absorption.
Other protection:	Use of an apron and overboots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization and absorption. Launder soiled clothes. Properly dispose of contaminated leather articles and other materials which cannot be decontaminated.
Local control measures:	Use adequate ventilation when working with material in an enclosed area. Mechanical methods such as fume hoods or area fans may be used to reduce localized vapor/mist areas. If vapor or mist is generated when the material handled, adequate ventilation in accordance with good engineering practice must be provided to maintain concentrations below the specified exposure. Eyewash stations and showers should be available in areas where this material is used and stored.
Other:	Consumption of food and drink should be avoided in work areas where product is present. Always wash hands and face with soap and water before eating, drinking or smoking.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Vapor pressure:	Not determined.
Specific gravity:	Approximately 0.8735 at 15.6°C (60.0°F).
Solubility:	Negligible in water, miscible in most petroleum solvents.
Percent volatile:	Not determined.
Vapor density (air=1):	>1.
Evaporation rate (n-Butyl Acetate=1):	Not determined.
Odor:	Mild, oily odor.
Appearance:	Dark fluid
Viscosity:	Approximately 17.5 cSt at 100°C (212°F).
Boiling point:	Not determined.
Pour/Freeze point:	Not determined.
Other:	Not applicable.

SECTION 10 STABILITY AND REACTIVITY

Stability:	Material is stable at room temperatures and pressure.
Conditions to avoid:	Avoid high temperatures and product contamination.

Lubrication Technologies Material Safety Data Sheet

Incompatibility with other materials:
Decomposition products:

Avoid contact with acids and oxidizing materials.

Smoke, carbon monoxide and dioxide, and other aldehydes of incomplete combustion. Oxides of carbon, nitrogen and sulfur; reactive hydrocarbons and irritating vapors.

Hazardous polymerization:
Other:

Will not occur.

Not applicable.

SECTION 11

TOXICOLOGICAL INFORMATION

Oral toxicity:

Not determined.

Dermal toxicity:

Not determined.

Inhalation toxicity:

On rare occasions, prolonged and repeated exposure to oil mist poses a risk of pulmonary disease such as chronic lung inflammation. This condition is usually asymptomatic as a result of repeated small aspirations. Shortness of breath and cough are the most common symptoms. Based on data from similar materials.

Dermal sensitization:

Prolonged or repeated contact may make skin more sensitive to other skin sensitizers. Based on data from similar materials.

Chronic toxicity:

Not determined.

Carcinogenicity:

Not determined.

Mutagenicity:

Not determined.

Reproductive toxicity:

Not determined.

Other:

These products contain petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils require a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

SECTION 12

ECOLOGICAL INFORMATION

Environmental toxicity:

Not determined. However, this material may be toxic to aquatic organisms and should be kept out of sewage and drainage systems and all bodies of water.

Environmental fate:

Not determined.

Other:

Not applicable.

SECTION 13

DISPOSAL CONSIDERATIONS

Waste disposal:

Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. This product unadulterated by other materials may be classified as a non-regulated waste in some areas - but still needs to be disposed of at approved facilities. Waste management should be in full compliance with federal, state, and local laws.

Disposal consideration:

Most used and non-use oils and solvents are incinerated by licensed burner facilities for heat value, or reclaimed by oil recycling services. Look in a local telephone directory or internet for headings under, 'Waste', 'Waste Services', 'Waste Disposal' for companies licensed to handle such material. Additional information can be obtained from local EPA, DNR, Sewer and Land-Fill sites. Unused, packaged fluids may be donated to other companies or charities (fluids MUST be unused).

Other:

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can only occur in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of

Lubrication Technologies Material Safety Data Sheet

this material must be conducted in compliance with all federal, state, and local regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT identification:

Not regulated

IMDG:

Not regulated

IATA:

Not regulated

SECTION 15 REGULATORY INFORMATION

Clean water act/oil pollution act:

Under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Control Act of 1990, this material is considered an oil. Any spill or discharges that produce a visible sheen or film on surface of water, or in waterways, ditches, or sewers leading to surface water must be reported. Contact the National Response Center at 800-424-8802.

TSCA:

All components of this material are listed in the U.S. TSCA Inventory.

Other TSCA:

Not applicable.

SARA Title III:

Section 302/304 extremely hazardous substances:

There are no components present at or greater than the de minimis concentration

Section 311, 312 hazard categorization:

Acute (immediate health effects): NO

Chronic (delayed health effects): NO

Fire (hazard): NO

Reactivity (hazard): NO

Pressure (sudden release hazard): NO

Section 313 toxic chemicals:

There are no components present at or greater than the de minimis concentration.

CERCLA:

For stationary/moving sources – reportable quantity (due to):

Exempt due to petroleum exclusion.

Other:

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. However, releases may be reportable to the Nation Response Center under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5) - see head of Section 15. Failure to report may result in substantial civil and criminal penalties.

Recommend contacting the local authorities in the event of any type of spill to determine local reporting requirements and also to aid in the cleanup.

SECTION 16 OTHER INFORMATION

	NFPA 704	KEY
HEALTH:	1	0 = Minimal
FIRE:	2	1 = Slight
REACTIVITY:	0	2 = Moderate
SPECIFIC HAZARD:	NONE	3 = Serious
PROTECTION INDEX:	N/A	4 = Severe

This product may be formulated in part with components purchased from other companies. In many instances, especially when proprietary or trade secret materials are used. Lube-Tech must rely on information provided by those materials manufacturers or distributors.

Version: I

Lubrication Technologies Material Safety Data Sheet

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Revisions / Comments:

MATERIAL SAFETY DATA SHEET

SECTION 1

PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: CAT ARCTIC DEO SYN 0W-30
Product Description: Synthetic Base Stocks and Additives
MSDS Number: 18230
Intended Use: Engine oil

COMPANY IDENTIFICATION

Supplier: Imperial Oil Products Division
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada
24 Hour Environmental / Health Emergency 519-339-2145
Telephone
Transportation Emergency Phone Number 519-339-2145
Product Technical Information 1-800-268-3183
Supplier General Contact 1-800-567-3776

SECTION 2

COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3

HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4

FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Eye Contact

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: 230C (446F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

Notification Procedures

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Avoid contact with used product. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to

be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
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Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid

Colour: Amber

Odour: Characteristic

Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.85

Flash Point [Method]: 230C (446F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

Boiling Point / Range: N/D

Vapour Density (Air = 1): N/D

VAPOUR PRESSURE: [N/D at 20 °C] | < 1 kPa (7.5 mm Hg) at 38C

Evaporation Rate (N-Butyl Acetate = 1): < 1

pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): > 3.5

Solubility in Water: Negligible
Viscosity: [N/D at 40°C] | 11.3 cSt (11.3 mm²/sec) at 100C
Oxidizing properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -45°C (-49°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Route of Exposure	Conclusion / Remarks
INHALATION	
Toxicity (Rat): LC50 > 5000 mg/m ³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Diesel engine oils: Not carcinogenic in animals tests. Used and unused diesel engine oils did not produce any carcinogenic effects in chronic mouse skin painting studies. Oils that are used in gasoline engines may become hazardous and display the following properties: Carcinogenic in animal tests. Caused mutations in vitro. Possible allergen and photoallergen. Contains polycyclic aromatic compounds (PAC) from combustion products of gasoline and/or thermal degradation products.

Contains:

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitising in test animals and humans.

Additional information is available by request.

CMR Status: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A

3 = IARC 2B
4 = ACGIH ALL

5 = ACGIH A1
6 = ACGIH A2

SECTION 12**ECOLOGICAL INFORMATION**

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

SECTION 13**DISPOSAL CONSIDERATIONS**

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Regulatory Disposal Information

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14**TRANSPORT INFORMATION**

LAND (TDG) : Not Regulated for Land Transport

LAND (DOT) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

National Chemical Inventory Listing: AICS, IECSC, DSL, ELINCS, ENCS, KECI, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ZINC DITHIOPHOSPHATE	68649-42-3	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4

3 = TSCA 5e

5 = TSCA 12b

2 = TSCA 5a2

4 = TSCA 6

6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 04: First Aid Skin - Header was modified.

Section 13: Disposal Considerations - Disposal Recommendations was modified.

Section 10: Materials To Avoid - Header was modified.

Section 15: National Chemical Inventory Listing was modified.

Section 16: MSN,MAT ID was modified.

Section 01: Product Identification Product Name was modified.

Section 15: List Citation Table - Header was modified.

Section 15: Canadian List Citations Table was added.

Section 15: Chemical Name - Header was added.
Section 15: CAS Number - Header was added.
Section 15: List Citations -Header was added.

WHMIS Classification: Not controlled

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Prepared By: Imperial Oil Limited, IH and Product Safety

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Cat® DEAC₂ (Diesel Engine Antifreeze Coolant) Premix 50/50

Product Use: Antifreeze/Coolant
Product Number(s): 07962, CPS227027

Company Identification
Chevron Products Company
Global Lubricants
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information
email : lubemsds@chevrontexaco.com
Product Information: 800-LUBE-TEK
MSDS Requests: 800-414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Ethylene Glycol	107-21-1	40 - 55 %weight
Diethylene glycol	111-46-6	1 - 5 %weight

Information on ingredients that are considered Controlled Products and/or that appear on the WHMIS Ingredient Disclosure List (IDL) is provided as required by the Canadian Hazardous Products Act (HPA, Sections 13 and 14). Ingredients considered hazardous under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, are also listed. See Section 15 for additional regulatory information.

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- HARMFUL OR FATAL IF SWALLOWED
- POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL THAT MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA
- MAY CAUSE DAMAGE TO:
- KIDNEY

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Toxic; may be harmful or fatal if swallowed.

Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: Contains material that may cause birth defects based on animal data.

Target Organs: Contains material that may cause damage to the following organ(s) following repeated ingestion based on animal data: Kidney

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

Flashpoint: Not Applicable

Autoignition: No Data Available

Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Dry Chemical, CO₂, AFFF Foam or alcohol resistant foam.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will not burn.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible,

observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling.

General Handling Information: Do not taste or swallow antifreeze or solution. Keep out of the reach of children and animals.

General Storage Information: Do not store in open or unlabeled containers.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Natural rubber, Neoprene, Nitrile Rubber, Polyvinyl Chloride (PVC or Vinyl).

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors, Dusts and Mists.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Country/ Agency	TWA	STEL	Ceiling	Notation
Ethylene Glycol	ACGIH	--	--	100 mg/m3	--

NOTE ON OCCUPATIONAL EXPOSURE LIMITS: Consult local authorities for acceptable provincial values in Canada. Consult the Canadian Standards Association Standard 94.4-2002 Selection, Use and Care of Respirators.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Purple

Physical State: Liquid

Odor: Faint or Mild

pH: 10 - 11

Vapor Pressure: 0.12 mmHg (Typical) @ 20 °C (68 °F)

Vapor Density (Air = 1): 2.1

Boiling Point: 108.9°C (228°F)

Solubility: Miscible

Freezing Point: -36.7°C (-34°F)

Specific Gravity: 1.13 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

Viscosity: No data available

Evaporation Rate: No Data Available

Odor Threshold: No Data Available

Coefficient of Water/Oil Distribution: No Data Available

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Hazardous Decomposition Products: Aldehydes (Elevated temperatures), Ketones (Elevated temperatures)

Hazardous Polymerization: Hazardous polymerization will not occur.

Sensitivity to Mechanical Impact: No.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: No product toxicology data available.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: LDLo-Lowest Lethal Dose: 1.56 g/kg (human) The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components. For additional information on the acute toxicity of the components, call the technical information center.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains diethylene glycol (DEG). The estimated oral lethal dose is about 50 cc (1.6 oz) for an adult human. DEG has caused the following effects in laboratory animals: liver abnormalities, kidney damage and blood abnormalities. It has been suggested as a cause of the following effects in humans: liver abnormalities, kidney damage, lung damage and central nervous system damage.

This product contains ethylene glycol (EG). The toxicity of EG via inhalation or skin contact is expected to be slight at room temperature. The estimated oral lethal dose is about 100 cc (3.3 oz.) for an adult human. Ethylene glycol is oxidized to oxalic acid which results in the deposition of calcium oxalate crystals mainly in the brain and kidneys. Early signs and symptoms of EG poisoning may resemble those of alcohol intoxication. Later, the victim may experience nausea, vomiting, weakness, abdominal and muscle pain, difficulty in breathing and decreased urine output. When EG was heated above the boiling point of water, vapors formed which reportedly caused unconsciousness, increased lymphocyte count, and a rapid, jerky movement of the eyes in persons chronically exposed. When EG was administered orally to pregnant rats and mice, there was an increase in fetal deaths and birth defects. Some of these effects occurred at doses that had no toxic effects on the mothers. We are not aware of any reports that EG causes reproductive toxicity in human beings.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE

This material is expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods. (See B.C. Reg. GY/92 Waste Management Act; R.R.O. 1990, Reg. 347 General-Waste Management; C.C.S.M.c. W40 The Waste Reduction and Prevention Act; N.S. Reg. 51/95 and N.S. Reg. 179/96 for examples of Provincial legislation.)

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

TC Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER TDG REGULATIONS

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: Anti-freeze Preparations, Proprietary; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

DOT Shipping Description: Anti-freeze Preparations, Proprietary

Additional Information: Bulk shipments with a reportable quantity (5000 pounds) of ethylene glycol are a hazardous material. The Proper Shipping Name is: Environmentally Hazardous Substance, Liquid, N.O.S. (ethylene glycol), 9, UN3082, III, RQ (ethylene glycol).

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
35=WHMIS IDL

The following components of this material are found on the regulatory lists indicated.

Ethylene Glycol 35

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), PICCS (Philippines), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: KECI (Korea).

WHMIS CLASSIFICATION:

Class D, Division 1, Subdivision B: Toxic Material -
Acute Lethality
Class D, Division 2, Subdivision A: Very Toxic Material -
Teratogenicity and Embryotoxicity

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations. (See Hazardous Products Act (HPA), R.S.C. 1985, c.H-3,s.2).

MSDS PREPARATION:

This Material Safety Data Sheet has been prepared by the Toxicology and Health Risk Assessment Unit, ERTC, P.O. Box 1627, Richmond, CA 94804, (888)676-6183.

Revision Date: August 23, 2007

SECTION 16 OTHER INFORMATION

HMIS RATINGS: Health: 2* Flammability: 0 Reactivity: 0

LABEL RECOMMENDATION:

Label Category : ANTIFREEZE/COOLANT 1 - AFC1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 16

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number

ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

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

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: CAT HYDRAULIC OIL (HYDO) SAE 10W
Product Description: Base Oil and Additives
MSDS Number: 17918
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: Imperial Oil Products Division
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada
24 Hour Environmental / Health Emergency Telephone 519-339-2145
Transportation Emergency Phone Number 519-339-2145
Product Technical Information 1-800-268-3183
Supplier General Contact 1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5

FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurised mists may form a flammable mixture.

Hazardous Combustion Products: Smoke, Fume, Sulphur Oxides, Aldehydes, Oxides of carbon, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: 225C (437F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6

ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other

shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate,

gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly affect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid

Form: clear

Colour: Amber

Odour: Characteristic

Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.87

Flash Point [Method]: 225C (437F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

Boiling Point / Range: N/D

Vapour Density (Air = 1): N/D

Vapour Pressure: [N/D at 20°C] | < 1 kPa (7.5 mm Hg) at 38C

Evaporation Rate (N-Butyl Acetate = 1): < 0.1

pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): > 3.5

Solubility in Water: Negligible

Viscosity: [N/D at 40°C] | 6 cSt (6 mm²/sec) at 100C

Oxidizing properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D

Melting Point: N/A

DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10	STABILITY AND REACTIVITY
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STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
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Acute Toxicity

<u>Route of Exposure</u>	<u>Conclusion / Remarks</u>
INHALATION	
Toxicity (Rat): LC50 > 5000 mg/m ³	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
INGESTION	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

Additional information is available by request.

CMR Status: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A

3 = IARC 2B
4 = ACGIH ALL

5 = ACGIH A1
6 = ACGIH A2

SECTION 12	ECOLOGICAL INFORMATION
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The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13	DISPOSAL CONSIDERATIONS
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Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14	TRANSPORT INFORMATION
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LAND (TDG) : Not Regulated for Land Transport

LAND (DOT) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

NATIONAL CHEMICAL INVENTORY LISTING: DSL, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ZINC DITHIOPHOSPHATE	68649-42-3	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2

3 = TSCA 5e
4 = TSCA 6

5 = TSCA 12b
6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

No revision information is available.

WHMIS Classification: Not controlled

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Product Name: CAT HYDRAULIC OIL (HYDO) SAE 10W
Revision Date: 07Aug2007
Page 8 of 8

Prepared By: Imperial Oil Limited, IH and Product Safety



MATERIAL SAFETY DATA SHEET

CAT AUTOMATIC TRANSMISSION FLUID (ATF)

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER	CAT AUTOMATIC TRANSMISSION FLUID (ATF)
WHMIS CLASSIFICATION	Not a controlled product.
PART No.	Chemtool, 711110, Caterpillar, 9U-7251, 9U-7252, 9U-7253, 9U-7254
SYNONYMS	CAT ATF
PRODUCT USE	Hydraulic Oil
SUPPLIER	Chemtool Incorporated P.O. Box 538 8200 Ridgefield Road Crystal Lake, IL 60039-0538 USA Tel: (815) 459-1250 Fax: (815) 459-1955
EMERGENCY TELEPHONE	Rocky Mountain Poison Center Denver, Colorado (800) 458-5924 U.S. and Canada. (303) 893-1322 Outside U.S.
*Date of last issue	2007-01-02

2. COMPOSITION AND INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS No.	WEIGHT
Lubricating oils (petroleum), base oils, highly refined**(2)	Mixture	90-95 %
AUTOMATIC TRANSMISSION FLUID ADDITIVES	Proprietary	1-5 %
*PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS	68649-42-3C	<0.3 %
*toluene	108-88-3	<0.1 %

* This chemical(s) is hazardous according to OSHA/WHMIS criteria

*COMPOSITION COMMENTS

Refer to section eight for exposure limits on ingredients.

Chemical ingredients not regulated by WHMIS are treated confidentially.

** (2) The base oil for this product can be a mixture of any of the following highly refined petroleum streams:

CAS 64741-88-4; CAS 64741-89-5; CAS 64741-96-4; CAS 64741-97-5; CAS 64742-01-4; CAS 64742-52-5; CAS 64742-53-6; CAS 64742-54-7; CAS 64742-55-8; CAS 64742-56-9; CAS 64742-57-0; CAS 64742-62-7; CAS 64742-63-8; CAS

64742-65-0; CAS 72623-83-7; CAS 72623-85-9; CAS 72623-86-0; CAS 72623-87-1.
Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and dewaxing to remove aromatics and improve performance characteristics. None of the oils used are listed as a carcinogen by NTP, IARC, or OSHA.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

*	Not regarded as a health hazard under current legislation. Prolonged exposure to product mist or vapors may cause respiratory irritation.
SENSITIZATION	No known information.
CARCINOGENICITY	NTP Not Listed. IARC Not Listed. OSHA Not Regulated.
TERATOGENICITY	No data available to indicate product or any components contained at greater than 0.1% may cause birth defects.
HEALTH WARNINGS	INHALATION. Oil mist can irritate airways and lungs. Inhalation of product vapor or mist may cause irritation of mucous membranes in nasal passages and throat. SKIN CONTACT. Slightly irritating. Prolonged or repeated contact leads to drying of skin. EYE CONTACT. Irritating to eyes. INGESTION. Could cause Stomach ache or vomiting. Main hazard, if ingested, is aspiration into the lungs and subsequent pneumonitis.
ROUTE OF ENTRY	Inhalation. Skin and/or eye contact. Ingestion.

4. FIRST AID MEASURES

INHALATION	Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from source of exposure Get medical attention if any discomfort continues. For breathing difficulties oxygen could be necessary.
EYES	Important! Immediately rinse with water for at least 15 minutes. Contact physician if irritation persists.
SKIN	Remove contaminated clothing. Wash skin thoroughly with soap and water. Contact physician if irritation continues.
INGESTION	DO NOT INDUCE VOMITING! Remove victim immediately from source of exposure. Get medical attention immediately! Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

FLASH POINT (°C)	> 175 (347 F) Cd OC (Cleveland open cup).
FLAMMABILITY LIMIT - LOWER(%)	0.9
FLAMMABILITY LIMIT - UPPER(%)	7.0
EXTINGUISHING MEDIA	Fire can be extinguished using: Carbon dioxide (CO2). Dry chemicals, sand, dolomite etc. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES	Use water spray to keep fire exposed containers cool and disperse vapors. Water spray may be used to flush spills away from exposures. Caution should be exercised when using water or foam as frothing may occur.
UNUSUAL FIRE & EXPLOSION HAZARDS	Pressure will increase in over heated, closed containers.
HAZARDOUS COMBUSTION PRODUCTS	Acrid smoke/fumes. Oxides of: Carbon.
PROTECTIVE MEASURES IN CASE OF FIRE	Self-contained breathing equipment and chemical resistant clothing recommended.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS	Minimize skin contact.
PRECAUTIONS TO PROTECT THE ENVIRONMENT	Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with applicable government regulations.
SPILL CLEAN-UP PROCEDURES	Contain spill. Absorb small amounts. Flush area with water.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS	Do not reuse container. Keep lid closed when not in use. Keep away from heat, sparks and open flame. Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Do not store or mix with strong oxidizers. Avoid spilling, skin and eye contact. Eye wash station should be available at the work place.
STORAGE PRECAUTIONS	Keep containers tightly closed. Keep away from heat, sparks and open flame. Store separate from strong acids and oxidizers.
STORAGE CRITERIA	Storage of chemicals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	STD	TWA	STEL	TWA	STEL
Lubricating oils (petroleum), base oils, highly refined**(2)	OSHA			5 mg/m3 (oil mist)	
	ACGIH			5 mg/m3 (oil mist)	10 mg/m3 (oil mist)

PROTECTIVE EQUIPMENT



ENGINEERING CONTROLS	Use engineering controls to reduce air contamination to permissible exposure level.
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VENTILATION	No specific ventilation requirements noted, but forced ventilation could still be required if air contamination exceeds acceptable level.
RESPIRATORS	No specific recommendation made, but respiratory protection could still be required under exceptional circumstances when excessive air contamination exists.
PROTECTIVE GLOVES	Chemical-resistant gloves required for prolonged or repeated contact. Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.
EYE PROTECTION	Wear splash proof eye goggles to prevent any possibility of eye contact.
PROTECTIVE CLOTHING	Wear appropriate clothing to prevent repeated or prolonged skin contact.
HYGIENIC WORK PRACTICES	Wash at the end of each work shift and before eating, smoking and using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE	Liquid.		
COLOR	Red.		
ODOR	Mild (or faint). Petroleum.		
SOLUBILITY DESCRIPTION	Insoluble in water.		
BOILING POINT (°C, range)	> 260 (500°F)	Pressure	760mmHg
DENSITY	0.83	Temperature (°C)	15.6 (60°F)
VAPOR DENSITY (air=1)	> 1		
EVAPORATION RATE	< 1	Reference	BuAc=1
pH-VALUE, CONC. SOLUTION	N/A		

10. STABILITY AND REACTIVITY

STABILITY	Normally stable.
CONDITIONS TO AVOID	Avoid contact with acids. Strong oxidizers.
HAZARDOUS POLYMERIZATION	Will not occur.
POLYMERIZATION DESCRIPTION	Not applicable.
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of: Carbon.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION	No experimental toxilogical data on the preparation as such is available.
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Component	Lubricating oils (petroleum), base oils, highly refined**(2)
Toxicological data	Carcinogenicity. IP 346 <3%

Toxic dose - LD50:	> 5000 mg/kg (oral rat)
Toxic dose - LD50 (skin):	> 2000 mg/kg (skin rabbit)
Toxic conc. - LC50:	n/a.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION	There is no ecological data on the product itself.
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13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS	Spilled material, unused contents and empty containers must be disposed of in accordance with local, state and federal regulations.
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14. TRANSPORT INFORMATION

DOT HAZARD CLASS	Not regulated.
*TDGR CLASS	Not Regulated.
SEA TRANSPORT NOTES	Not regulated per IMDG.
AIR TRANSPORT NOTES	Not regulated per IATA.

15. REGULATORY INFORMATION

US FEDERAL REGULATIONS

COMPONENT	SARA 302	CERCLA	SARA 313
PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS	No	***	N982 - Zn
AUTOMATIC TRANSMISSION FLUID ADDITIVES	No	No	No
Lubricating oils (petroleum), base oils, highly refined**(2)	No	No	No

*REGULATORY STATUS	*** Indicates that no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985). Values in Section 313 column represent Category Codes for reporting under Section 313.
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COMPONENT	CA	MA	FL	MN	NJ	PA	RI
Lubricating oils (petroleum), base oils, highly refined**(2)					Yes	Yes	
PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS				Yes	Yes	EH	

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM - WHMIS

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations. This product or its components, if a mixture, is subject to the following regulations: Canadian WHMIS.

CONTROLLED PRODUCT CLASSIFICATION

Not a controlled product.

GLOBAL INVENTORIES

COMPONENT	CAN	US	EU	AUS	JAP	KOR	PHLP	CHN
Lubricating oils (petroleum), base oils, highly refined** (2)	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes
AUTOMATIC TRANSMISSION FLUID ADDITIVES	DSL	Yes	EINECS	Yes	Yes	Yes	Yes	Yes
PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS	NPRI	Yes	EINECS	Yes	Yes	Yes	Yes	Yes

CANADA CEPA: All components of this product comply with new substance notification requirements under the Canadian Environmental Protection Act (CEPA).

16. OTHER INFORMATION

NFPA-HMIS HAZARD RATING

HEALTH Irritation, minor residual injury (1).

FLAMMABILITY Burns only if pre-heated (1).

REACTIVITY (0) - HMIS/NFPA

PERSONAL PROTECTION INDEX B - Safety Eyewear and Gloves

***Tariff Code (Schedule B)** 2710.19.3040 Automotive gear oils.

REVISION COMMENTS Section 2: Ingredients
Section 15: Inventory Status

PREPARED BY John Dingess
James W. Hermann

***Replacement of MSDS generated** 2005-02-24

***DATE** 2007-01-02

DISCLAIMER While the information and recommendations set forth herein are believed to be accurate as of the date thereof, Chemtool Incorporated makes no warranty with respect thereto and disclaims all liability from reliance therein.

*** Information revised since previous MSDS version**

PRINTING DATE: 2007-01-02

MATERIAL SAFETY DATA SHEET

SECTION I: IDENTIFICATION OF PRODUCT

COMPANY: **Diversity Technologies Corp.** DATE: **Dec. 19, 2008**
8750 – 53rd Ave. PHONE: 780-468-4064
Edmonton, AB T6E 5G2 FAX: 780-469-1899

PRODUCT NAME: **550X POLYMER**

PRODUCT USE: Drilling mud additive.
CHEMICAL FAMILY: Anionic water soluble polymer CAS#: Not available

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

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

TRANSPORTATION OF DANGEROUS GOODS (TDG)

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

SECTION II: HAZARDOUS INGREDIENTS

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

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: [] EYE CONTACT [] SKIN [] INHALATION [] INGESTION
EYE CONTACT: May cause slight irritation and/or redness.
SKIN CONTACT: May cause slight irritation some cases.
INGESTION: No effects expected.
INHALATION: May cause irritation of the respiratory tract, including sneezing and coughing.
CARCINOGENICITY: No information available.
TERATOGENICITY: No information available.
REPRODUCTIVE TOXICITY: No information available.
MUTAGENICITY: No information available.

**SYNERGISTIC
PRODUCTS:**

No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Wash thoroughly with soap and water. If irritation develops or persists, obtain medical attention.

EYE CONTACT: Flush with gently flowing warm water until irritation subsides. If irritation persists, obtain medical attention.

INGESTION: This product is not considered toxic based on studies on lab animals. Do not induce vomiting. Give 2-3 glasses of water. If symptoms occur, obtain medical attention.

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

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	White granular powder; no odour
SPECIFIC GRAVITY:	Not available
BOILING POINT (°C):	Not available
MELTING POINT (°C):	Not available
SOLUBILITY IN WATER:	Soluble
PERCENT VOLATILE BY VOLUME:	Not available
EVAPORATION RATE:	Not available
VAPOUR PRESSURE (mmHg):	Not available
VAPOUR DENSITY (air = 1):	Not available
BULK DENSITY:	Not available

pH: 4-9 (@ 5 g/L)

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable
FLAMMABLE LIMITS:	Not applicable
EXTINGUISHING MEDIA:	Carbon dioxide, dry chemical, foam, in preference to a water spray.
SPECIAL FIRE FIGHTING PROCEDURES:	Self contained breathing apparatus required for fire fighting personnel. Move containers from fire area if possible.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	As with most organic powders, flammable dust clouds may be formed in air. Avoid creating dust. Avoid sources of ignition. Product is extremely slippery when wet.

SECTION VII: REACTIVITY DATA

STABILITY:	STABLE [XX]	UNSTABLE []
INCOMPATIBILITY (CONDITIONS TO AVOID):	Avoid contact with strong oxidizers. Avoid wet, damp or humid conditions, extremes of temperature, and ignition sources.	
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxides of carbon and nitrogen, various hydrocarbons, and/or ammonia upon combustion	
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR [XX]	MAY OCCUR []

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

RESPIRATORY PROTECTION:	Use approved dust mask in absence of adequate ventilation. Use approved respirators with dust cartridges if TLV is exceeded.
VENTILATION:	Use in well-ventilated area, or use local exhaust ventilation, process enclosure or other engineering controls to maintain dust level below TLV.
PROTECTIVE GLOVES:	Use gloves, if needed, to avoid prolonged or repeated skin contact.
EYE PROTECTION:	Use safety glasses or goggles.
OTHER PROTECTIVE EQUIPMENT (Specify):	As necessary to prevent contact. Ensure eyewash station and emergency shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid prolonged or repeated breathing of dust and contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Cleanse skin thoroughly after contact, before breaks and meals and at end of work period. Product is readily removed from skin by washing thoroughly with soap and water. Store in a cool, dry location away from incompatibles. Store in original container.

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

Use appropriate safety equipment. Sweep up dry material and flush spill area with water. Collect uncontaminated material for repackaging. Collect contaminated material in approved containers for disposal. Scrub spill area with dry absorbent and then flush residue with water to eliminate slip hazard. Absorb spills of dilute solutions with inert absorbent. Collect in approved containers for disposal. The product or its solutions should not be allowed to enter waterways without treatment. Spilled solutions can create a hazard because of their slippery nature.

WASTE DISPOSAL METHOD

Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine if material meets the criteria of hazardous waste at the time of disposal. It may be possible to dispose of spills of non-hazardous materials in a landfill; check with local operator.

SECTION IX: PREPARATION

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

DATE ISSUED: December 19, 2008

SUPERSEDES: January 3, 2006

BY: Product safety committee

PHONE: 780-440-4923

MATERIAL SAFETY DATA SHEET**SECTION I: IDENTIFICATION OF PRODUCT**

COMPANY: **Diversity Technologies Corp.** DATE: **Dec. 9, 2008**
8750 – 53rd Ave. PHONE: 780-440-4923
Edmonton, AB T6E 5G2 FAX: 780-469-1899

PRODUCT NAME: **BIG BEAR ROD GREASE**

PRODUCT USE: Anti-seize compound
CHEMICAL FAMILY: Mixture CAS #: Mixture

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: Not WHMIS regulated.
WORKPLACE HAZARD: Not hazardous under normal conditions of use.

TRANSPORTATION OF DANGEROUS GOODS (TDG)

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

SECTION II: HAZARDOUS INGREDIENTS

<u>INGREDIENT</u>	<u>% (w/w)</u>	<u>CAS NUMBER</u>	<u>LD₅₀ Oral-Rat</u>	<u>LC₅₀ Inhal-Rat</u>	<u>ACGIH-TLV</u>
Mineral oil	70-80	64742-52-5	Not available	Not available	Not available
Barium soap	20-30	68201-19-4	Not available	Not available	Not available

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: [XX] EYE CONTACT [XX] SKIN [] INHALATION [XX] INGESTION
EYE CONTACT: May cause slight transient irritation.
SKIN CONTACT: May cause slight transient irritation.
INGESTION: No effects known.
INHALATION: Not a likely source of contact during normal use.
CARCINOGENICTY: None of the ingredients in the compound are listed by NTP, IARC or OSHA as being carcinogenic.
TERATOGENICITY: No information available.

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Canamara-United Supply, Hollimex Products, The Drilling Depot and
Westcoast Drilling Supplies**

REPRODUCTIVE
TOXICITY: No information available.
MUTAGENICTY: No ingredients listed as mutagenic.
SYNERGISTIC
PRODUCTS: No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Remove by wiping, or with a waterless hand cleaner. Wash with soap and water. Remove and launder contaminated clothing before re-use.

EYE CONTACT: Immediately flush with gently flowing warm water until all residual material is removed. Remove contact lenses if present. Hold eyelids open to ensure thorough flushing. If irritation persists, obtain medical attention.

INGESTION: Do not induce vomiting. Rinse mouth. Obtain immediate medical attention. Never give anything by mouth to an unconscious or convulsing victim.

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

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Brown paste; bland odour	
SPECIFIC GRAVITY:	0.90 @ 16°C	
BOILING POINT (°C):	371	
MELTING POINT (°C):	204	
SOLUBILITY IN WATER:	Insoluble	pH: Not available
PERCENT VOLATILE BY VOLUME:	Not available	
EVAPORATION RATE:	Not available	
VAPOUR PRESSURE :	Not available	
VAPOUR DENSITY (air = 1):	Not available	
BULK DENSITY:	Not applicable	

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 188°C (D-92)

FLAMMABLE LIMITS: Not available

EXTINGUISHING MEDIA: Dry chemical, CO₂, foam or water spray.

SPECIAL FIRE FIGHTING
PROCEDURES: Self-contained breathing apparatus required for fire fighting personnel. Remove containers from fire area, or cool with water spray, if possible.

**UNUSUAL FIRE AND
EXPLOSION HAZARDS:**

This product may burn under fire conditions.

SECTION VII: REACTIVITY DATA

STABILITY:	STABLE [XX]	UNSTABLE []
INCOMPATIBILITY (CONDITIONS TO AVOID):	Strong oxidizers. Avoid heat, sparks and open flames.	
CONDITIONS OF REACTIVITY:	Contact with incompatibles or ignition sources.	
HAZARDOUS DECOMPOSITION PRODUCTS:	May release CO _x , smoke and irritating vapours when heated to decomposition.	
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR [XX]	MAY OCCUR []

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

RESPIRATORY PROTECTION:	Not required under normal conditions of use.
VENTILATION:	Not required under normal conditions of use.
PROTECTIVE GLOVES:	Suggest neoprene or viton.
EYE PROTECTION:	Safety glasses with side-shields if required.
OTHER PROTECTIVE EQUIPMENT (Specify):	Protective clothing as required to prevent contact. Ensure eyewash station and emergency shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid contact with skin and eyes. Avoid ingestion. Wash thoroughly before eating, drinking or smoking. Store in cool, dry area away from incompatibles and sources of ignition. Use caution when opening unvented containers. Use in well ventilated area. Store unused material in original container.

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

Use appropriate safety equipment. Eliminate ignition sources. Scoop up excess, then wipe down the affected area and pick up residual with diatomaceous earth to prevent slipping hazard. Place contaminated material and clean up materials in approved containers for disposal.

WASTE DISPOSAL METHOD

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

SECTION IX: PREPARATION

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

DATE ISSUED:	December 9, 2008	BY:	Product safety committee
SUPERSEDES:	December 20, 2005	PHONE:	780-440-4923

MATERIAL SAFETY DATA SHEET**SECTION I: IDENTIFICATION OF PRODUCT**

COMPANY: **Diversity Technologies Corp.** DATE: **Dec. 22, 2008**
8750-53 Ave. PHONE: 780-468-4064
Edmonton, AB T6E 5G2 FAX: 780-469-1899

PRODUCT NAME: **DR-133 POLYMER**

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

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

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

TRANSPORTATION OF DANGEROUS GOODS (TDG)

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

SECTION II: HAZARDOUS INGREDIENTS

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

SECTION III: HEALTH HAZARDS

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

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Canamara-United Supply, Hollimex Products, The Drilling Depot and
Westcoast Drilling Supplies.**

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

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Remove contaminated clothing. Wash exposed area thoroughly with soap and water. If irritation develops or persists, obtain medical attention.

EYE CONTACT: Flush with gently flowing warm water for 15 minutes or until irritation subsides. Obtain medical attention when flushing period is complete.

INGESTION: Do not induce vomiting. Give 1-2 glasses of water. Obtain immediate medical attention. Do not give anything by mouth if patient is unconscious, rapidly losing consciousness or convulsing.

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

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Liquid emulsion; petroleum odour
SPECIFIC GRAVITY:	Not available
BOILING POINT (C):	Not available
MELTING POINT (C):	Not available
SOLUBILITY IN WATER:	Forms gel pH: 7-9 (@ 0.6%)
PERCENT VOLATILE BY VOLUME:	Not available
EVAPORATION RATE:	Not available
VAPOUR PRESSURE (mmHg):	Not available
VAPOUR DENSITY (air = 1):	Not available
BULK DENSITY:	Not applicable

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	65 C (TCC)
FLAMMABLE LIMITS:	Not applicable
EXTINGUISHING MEDIA:	Carbon dioxide, dry chemical, foam, in preference to a water spray.

**SPECIAL FIRE FIGHTING
PROCEDURES:**

Self contained breathing apparatus required for fire fighting personnel. Move containers from fire area, or cool with water spray, if possible.

**UNUSUAL FIRE AND
EXPLOSION HAZARDS:**

Vapours may travel to ignition source and flash back.

SECTION VII: REACTIVITY DATA**STABILITY:**

STABLE [XX]

UNSTABLE []

INCOMPATIBILITY

Avoid contact with strong oxidizers and strong reducing agents. Avoid ignition sources.

(CONDITIONS TO AVOID):**CONDITIONS OF REACTIVITY:**

None known.

HAZARDOUS DECOMPOSITION

Oxides of carbon and nitrogen upon combustion

PRODUCTS:**HAZARDOUS POLYMERIZATION:**

WILL NOT OCCUR [XX] MAY OCCUR []

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

Use approved respirators with organic vapour cartridges if TLV is exceeded.

VENTILATION:

Use in well-ventilated area, or use local exhaust ventilation, process enclosure or other engineering controls to maintain vapour/mist level below TLV.

PROTECTIVE GLOVES:

Neoprene or viton recommended.

EYE PROTECTION:

Wear chemical goggles when handling.

**OTHER PROTECTIVE EQUIPMENT
(Specify):**

As necessary to prevent contact. Ensure eyewash station and emergency shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

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

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

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

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

WASTE DISPOSAL METHOD

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

SECTION IX: PREPARATION

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

DATE ISSUED: December 22, 2008
SUPERSEDES: January 3, 2006

BY: Product safety committee
PHONE: 780-440-4923

MATERIAL SAFETY DATA SHEET**SECTION I: IDENTIFICATION OF PRODUCT**

COMPANY: **Diversity Technologies Corp.** DATE: **Dec. 23, 2008**
8750-53 Ave. PHONE: 780-468-4064
Edmonton, AB T6E 5G2 FAX: 780-469-1899

PRODUCT NAME: **W-OB POLYMER**

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

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: D2B
WORKPLACE HAZARD: Skin and eye irritant

TRANSPORTATION OF DANGEROUS GOODS (TDG)

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

SECTION II: HAZARDOUS INGREDIENTS

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

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: [XX] EYE CONTACT [XX] SKIN [XX] INHALATION [XX] INGESTION
EYE CONTACT: Irritant. Can cause redness, tearing and inflammation.
SKIN CONTACT: Irritant. Can cause redness, irritation and inflammation.
INGESTION: Low oral toxicity. May cause nausea, abdominal cramps and diarrhea.
INHALATION: High concentrations of vapour and mist can cause irritation of the nose and throat
CARCINOGENICITY: No information available.
TERATOGENICITY: No information available.
REPRODUCTIVE TOXICITY: No information available.

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

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

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Remove contaminated clothing. Immediately wash exposed area with water and soap for 5 minutes. If irritation persists, obtain medical attention.

EYE CONTACT: Immediately flush with gently flowing warm water for 15 minutes, or until irritation ceases. When flushing period is completed, obtain medical attention.

INGESTION: Rinse mouth and give 1 - 2 glasses of water to dilute. **Do not induce vomiting unless directed to do so by medical personnel.** If vomiting occurs keep head below hips to prevent aspiration. Even small amounts of liquid drawn into the lungs from swallowing, or vomiting may cause severe health effects. Obtain medical attention. Never give anything by mouth if patient is unconscious, rapidly losing consciousness or convulsing.

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

SECTION V: PHYSICAL DATA

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

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not flammable
FLAMMABLE LIMITS:	Not determined
EXTINGUISHING MEDIA:	CO ₂ , water, mist, foam
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained breathing apparatus required for fire fighting personnel.

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

**UNUSUAL FIRE AND
EXPLOSION HAZARDS:**

None known.

SECTION VII: REACTIVITY DATA

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

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

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

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

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

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

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

WASTE DISPOSAL METHOD

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

SECTION IX: PREPARATION

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

DATE ISSUED: December 23, 2008

SUPERSEDES: January 18, 2006

BY: Product safety committee

PHONE: 780-440-4923

Material Safety Data Sheet
Howes Lubricator Diesel Treat & Anti Gel (Canadian)

Section I : Product Information

Material Name Identifier: Howes Lubricator - Diesel Fuel Conditioner Anti-gel
Manufacturer's Name: R.B. Howes & Co. Inc. **Address:** PO Box 100, Coventry, RI. 02816
Emergency Telephone Number: 401-294-5500
Supplier's Name: Vulsay Industries Ltd **Address:** 35 Regan Rd., Brampton, Ontario L7A 1B2
Phone Number: 416-846-2200
Trade Name: Howes Lubricator : Diesel Treat & Fuel Conditioner **Product Use:** Diesel Fuel Conditioner
WHMIS Classification: Class B, Division 3: Combustible Material
Class D, Division 2: Very Toxic Material



Section II : Hazardous Ingredients

Chemical Identity	Concentration (V / V)	CAS #	LD50 (Species And Route)	LC50
Severely Hydrotreated Petroleum Oil And Severely Refined Petroleum	30 to 60 %	64742-52-5	Not Established	Not Available
		64742-01-4		
Hydrotreated Petroleum Distillate	15 to 40 %	64742-47-8	Rat - Oral > 5 g/kg	Rat ->5 g/m3
Heavy Aromatic Naphtha	5 to 10 %	64742-94-5	3 g/kg Oral rat >3 g/kg skin rabbit	Not Available

Section III : Physical Data

Physical State : Liquid
Odor Threshold : Not Determined
Coefficient of Water/Oil Distribution : Insoluble in Water
Vapour Pressure (Air = 1) : <0.1 mm
Freezing Point (deg C) : Not Determined
Evaporation Rate : (nbuac = 1) : 0.01

Odor and Appearance : Light Amber with Distinctive Odor
Specific Gravity : 0.8 - 0.9

Boiling Point (deg C) : 172
PH : Not applicable
% Volatile (by volume) : 100

Vapour Density (Air = 1) : >1

Section IV : Fire or Explosion Hazard

Conditions of Flammability : Excessive Heat
Means of Extinction : Foam , CO2, Dry Chemical, Water fog or spray
Flash Point (C) and method : 71 Cleveland (open cup)
Upper Flammable Limits % : Data not available
Autoignition Temperature (c) : Data not available
Asphyxiates when burning.

Lower Flammable Limits % : Data not available
Hazardous Combustion Products : Carbon Monoxide and

Special Fire Fighting Procedures : Use air supplied breathing equip. for enclosed areas. Avoid breathing vapors or fumes. Cool exposed containers with water spray.
Unusual Fire and Explosion Hazard : Data not available

Section V : Reactivity Data

Stability : Normally stable, Will not polymerize

Incompatible Materials : Strong Oxidants like liquid chlorine or concentrated oxygen.

Conditions to Avoid : Excessive Heat

Hazardous Decomposition or Byproducts : Carbon Oxides (CO, CO₂) and Asphyxiates when Burning.

Section VI : Toxicological Properties

Route(s) of Entry : Inhalation: TLV 5mg / M3 for oil mist in the air, Skin: Prolonged Contact, Ingestion: Poisonous

Effect of Acute and Chronic Exposure to Product : Prolonged or repeated skin contact may cause skin irritation. Ingestion harmful or fatal if not treated. Prolonged exposure to heavy concentrations of fumes may cause irritation to mucus membranes and airway.

Signs and Symptoms of Exposure: Eyes, skin or air passages may become red and irritated. Ingestion may cause cramps and nausea.

Medical Conditions Generally Aggravated by Exposure: Respiratory diseases such as asthma. Cuts, rashes or similar skin diseases may be adversely affected by prolonged or repeated exposure.

Synergistic Products: None Known

Evidence of Carcinogenicity, Reproductive Toxicity, Teratogenicity or Mutagenicity? : Not Established

Sensitivity to Product: Potential skin sensitizer.

Section VII : Preventive Measures

Personal Protective Equipment : Apron to avoid contact with clothing.

Gloves (specify) : Viton, Nitrile or PVC.

Respiratory (specify) : Not normally need however use organic vapor vap, cartridge @ low concentrations. SCBA or line supply respirator @ high concentrations.

Eyes (specify) : Safety Glasses w/side shield or anti-splash goggles or face shield.

Footwear (specify) : Impervious for high exposure risk.

Engineering Controls : As necessary for 5MG / M3 TLV

Leak and Spill Procedure : Eliminate ignition sources, isolate area, wear respirator and protective clothing. Stop leak if safe to do so. Dike / Boom to contain liquid. Recover free liquid. Use oil absorbents to clean up trace amounts. Prevent contamination of sewers and open water sources. Notify appropriate environmental agency.

Waste Disposal : Dispose in accordance with local, provincial / state and federal regulations.

Handling Procedures and Equipment : Keep containers closed when not in use. Do not handle near heat, sparks or strong oxidants. Ground containers for decanting. Use ventilation if necessary. **Avoid breathing fumes and prolonged / repeated skin contact.** Use good personal hygiene, launder contaminated clothing before reuse.

Storage Requirements : Cool, clean, dry, well ventilated room away from sources of ignition.

Section VIII : First Aid Measures

Inhalation : Remove victim to fresh air. Call for medical help.

Ingestion : DO NOT induce vomiting, Get medical help immediately. Keep victim at rest.

Eye Contact : Flush with water for 15-20 minutes. see doctor if irritation persists.

Skin Contact : Remove contaminated clothing, wash with mild soap and water, if irritation persists, obtain medical help.

Additional Information

MSDS Preparation - Sources Used : M.S.D.S. of product (U.S. Version), Components and similar products.

Prepared By : Quality control department.

Date : May 31, 2005, **Revision #4**

Revision Notes: Reprint with no revisions

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The recommendations and data presented herein are based on sources considered to be reliable. However, no warranty is expressed or implied regarding the accuracy of the data or the results obtained from the use of this information or the use of product. Vulsay Industries Ltd. expressly disclaims all liability for loss or damage, including consequential loss, or injury to persons (Including Death) arising directly or indirectly from reliance upon the information or use of the material.

Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer



Material Safety Data Sheet

Section 1 PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer

Company Identification

Spectrum Lubricants Corporation
500 Industrial Park Drive
Selmer, TN 38375-3276
United States of America

Emergency Response

North America: CHEMTREC (800) 424-9300 after 5:00pm CST
Or (703) 527-3887

Health Emergency

USA: (800) 264-6457 or (731) 645-4972

Product Information

MSDS Requests: (800) 264-6457 or (731) 645-4972
Technical Information: (800) 264-6457 or (731) 645-4972
General Information: vswedley@spectrumcorporation.com

Product Family	Petroleum Lubricating Oil
CAS Number	Mixture

Note: Petroleum lubricating oils with a flashpoint above 200°F, are not regulated by D.O.T standards.

Section 2 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS

Inhalation:	Inhalation of fumes may result in dizziness, headache and respiratory irritation.
Eye Contact:	Contact with eyes may cause minimal irritation.
Skin Contact:	Mild irritation may occur with prolonged or repeated contact.
Ingestion:	Slightly toxic. Pulmonary aspiration hazard if vomiting occurs.

**Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer**

TLV: 5mg/m3 as mist. ACGIH 1984-85.
Chronic Effects: This product may contain ingredients that are listed as potential carcinogens in N.T.P. Annual Report on Carcinogens, I.A.R.C. Monographs, or by O.S.H.A. HCS (g) (2) (vii).

Section 3 COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENTS	COMPONENTS	CAS Number	EU Number	Concentration (%)
Benzenesulfonic acid, propenated, calcium salt, overbased	Performance Additive Mixture	68610-84-4	271-877-7	7-13
Benzenesulfonic acid, C10-60-alkyl derivs., calcium salts		90194-636-7	290-636-7	
Phenol, 2,2'-polythiobis[4-C8-30-alkyl derivs., calcium salts, overbased		90480-91-4	291-829-9	
Distillates (petroleum), hydrotreated light	Solvent	64742-47-8	265-149-8	18-25
Distillates (petroleum), hydrotreated heavy paraffinic	Base Oil	64742-54-7	265-157-1	40-60
	Synthetic PIB	Non-hazardous		30-42
N,N'-di-sec-butyl-p-phenylenediamine	Fuel Stabilizer	101-96-2	202-992-2	<0.3

Note that the chemical identity of some or all of the above components is considered confidential business information and is being withheld as permitted by 29CFR 1910.1200 and various State Right-To-Know Laws.

Section 4 FIRST AID MEASURES

Skin: Wash skin with soap and warm water. Wash clothing before re-use.
Eye: If splashed into eyes flush eyes with clear water for five (5) minutes.
Inhalation: If overcome by fumes remove from exposure immediately.
Ingestion: If ingested, do not induce vomiting. Call a physician.

Section 5 FIRE FIGHTING MEASURES

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions:

For fires involving this material, do not enter any enclosed or confined fire space without proper protective

**Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer**

equipment, including self contained breathing apparatus.

Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.
Special Firefighting Procedures: Cool exposed containers with water spray.
Unusual Fire and Explosion Hazards: Pressure increase in over heated closed containers. Cool containers with water spray.

Section 6 ACCIDENTAL RELEASE MEASURES

Spill Procedures: Remove ignition sources. Recover Liquid. Add absorbent to spill area. Ventilate confined spaces. Advise authorities if product enters sewers, etc.
Waste Disposal: Assure conformity with applicable disposal regulations. Dispose of absorbed material at approved waste site.

Precautionary Measures:

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

Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Section 7 HANDLING AND STORAGE

General Storage Information:

Keep container closed when not in use. Do not store with strong oxidizing agents. Do not store at elevated temperatures.

Container Warnings:

Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

Section 8 EXPOSURE CONTROLS/ PERSONAL PROTECTION

COMPONENTS	Regulatory Agency	Exposure Limit
Performance Additive Mixture	OSHA/ACGIH	5mg/m3 Mist
Solvent	OSHA/ACGIH	5mg/m3 Mist
Base Oil	OSHA/ACGIH	5mg/m3 Mist

**Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer**

Synthetic PIB	Non-regulated	
Fuel Stabilizer	OSHA/ACGIH	Not Established

Ventilation Procedure: Ventilate as needed to comply with exposure limit.
Gloves Protection: Use impervious gloves to avoid repeated/prolonged skin contact.
Eye Protection: Use goggles/face shield to avoid eye contact.
Work/Hygienic Practices: If clothing becomes contaminated, change to fresh clean clothing. Do not wear until thoroughly laundered.

Section 9 PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure (mmHg) at 20°C:	<1
Specific Gravity at 60°F:	0.86
Water Solubility:	Negligible
Boiling Point:	600+°F
Vapor Density (Air=1):	> 5
Evaporation Rate (BUAC=1):	< 1
Odor:	Mild Petroleum Odor
Appearance:	Dark Blue Color Liquid
Viscosity at 100°C CST:	7.5 (typical)
V.O.C.	140 – 195 g/L
Flash Point	210°F
Fire Point	245°F

Section 10 STABILITY AND REACTIVITY

Stability: Stable
Incompatibility: Avoid strong oxidants
Polymerization: Will not occur
Thermal Decomposition: Partial burning produces fumes, smoke and carbon monoxide.

Section 11 TOXICOLOGY INFORMATION

Distillates (petroleum), hydrotreated light

ORAL (LD50): Acute: >5000 mg/kg [Rat].

DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Studies on laboratory animals have associated similar materials with eye and respiratory tract irritation. Repeated exposure to elevated concentrations of hydrocarbon solvents can produce a variety of transient CNS effects (e.g., dizziness, headache, narcosis, etc). Studies on laboratory animals have shown similar materials to cause skin irritation after repeated or prolonged contact. Repeated direct application of similar materials to the skin can produce

**Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer**

defatting dermatitis and kidney damage in laboratory animals. The most common effects observed in repeated dose animal studies with mineral spirits are kidney changes that are consistent with an alpha 2u-globulin- mediated process that is not regarded as relevant to humans. Certain studies have reported effects in the liver as well as hematological or urine chemistry changes. In general, these effects have not to been shown to be dose-related.

Highly-refined petroleum lubricant oils:

ORAL (LD50): Acute: >5000 mg/kg [Rat].

DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested

Section 12 ECOLOGICAL INFORMATION

Ecotoxicity

An environmental fate analysis is not available for this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum products.

Petroleum-based (mineral) lubricating oils normally will float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

Environmental Fate

Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.

Section 13 DISPOSAL CONSIDERATIONS

Waste Disposal:

Assure conformity with applicable disposal regulations.
Dispose of absorbed material at approved waste site.

Section 14 TRANSPORTATION INFORMATION

Note: Petroleum lubricating oils with a flashpoint above 200°F, are not regulated by D.O.T standards.

Section 15 REGULATORY INFORMATION

Product Trade Name: HUSQVARNA 50:1 Low Smoke Two-Cycle Engine
Oil w/ fuel stabilizer

**California
Proposition 65:**

This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): 0.008% Toluene, CAS no. 108-88-3

Section 16 OTHER INFORMATION

Risk Phrases

R37	Inhalation:	Inhalation of fumes may result in dizziness, headache and respiratory irritation.
R36	Eye Contact:	Contact with eyes may cause minimal irritation.
R38	Skin Contact:	Mild irritation may occur with prolonged or repeated contact.
R22	Ingestion:	Slightly toxic. Pulmonary aspiration hazard if vomiting occurs.

The data presented herein is based upon tests and information, which we believe to be reliable. However, users should make their own investigations to determine the suitability of the information for their particular purpose.

MATERIAL SAFETY DATA SHEET

SECTION 1 -- IDENTIFICATION

Product Trade Name: Husqvarna 50wt Bar and Chain Oil
Revision Date: 02/28/02
Phone Number: (731) 658-9050
Fax Number: (731) 658-3591
Emergency Number: 800-424-9300 after 5:00 p.m.
Chemical Family: Petroleum Lubricating Oil

NOTE: Petroleum lubricating oils with a flashpoint above 200°F, are not regulated by D.O.T. standards.

SECTION 2 -- HAZARDOUS INGREDIENTS

<u>Name</u>	<u>CAS #</u>	<u>Approximate %</u>	<u>Regulatory Agency</u>	<u>Exposure Limit</u>
Base Oil	64742-52-5	90-100	OSHA/ACGIH	5mg/m3 Mist
Tackifier	64742-52-5	.50-5.0	OSHA/ACGIH	5mg/m3 Mist

HMIS/NFPA CODES

Health	Flammability	Reactivity	Protective Equipment
1	1	0	C, D, H

See Section 6, Chronic Effects, for potential over-exposure hazard.

SECTION 3 -- PHYSICAL DATA

Vapor Pressure (mmHg) at 20°C: <1
Specific Gravity at 60°F: 0.93
Water Solubility: Negligible
Boiling Point: Wide Range
Vapor Density (Air=1): >1
Evaporation Rate (BUAC=1): <1
Odor: Mild Hydrocarbon Odor
Appearance: Amber Colored Liquid
Viscosity at 100°C CST: 18.3

SECTION 4 -- FIRE AND EXPLOSION HAZARDS

Flash Point: 475°F
Fire Point: 505°F
Extinguishing Media: Water Fog, Chemical Foam, Dry Chemical Powder, CO2
Special Firefighting Procedures: Cool exposed containers with water spray. Avoid breathing fumes.
Unusual Fire and Explosion Hazards: Pressure increase in over heated closed containers. Cool containers with water spray.

SECTION 5 -- REACTIVITY DATA

Stability:
Incompatibility:
Polymerization:
Thermal Decomposition:

Stable
Avoid strong oxidants.
Will not occur.
Partial burning produces fumes, smoke and carbon monoxide.

SECTION 6 -- HEALTH HAZARD DATA

Inhalation:
Eye Contact:
Skin Contact:
Ingestion:
TLV:
Chronic Effects:

Inhalation of fumes may result in dizziness, headache and respiratory irritation.
Contact with eyes may cause minimal irritation.
Mild irritation may occur with prolonged or repeated contact.
Slightly toxic. Pulmonary aspiration hazard if vomiting occurs.
5mg/m3 as mist. ACGIH 1984-85.
Product has a low order of acute oral toxicity.
Ingredients of this product are not listed as potential carcinogens in N.T.P. Annual Report on Carcinogens, I.A.R.C.
Monographs, or by O.S.H.A. HCS (g) (2) (vii).

SECTION 7 -- SPECIAL PROTECTION INFORMATION

Ventilation Procedure:
Gloves Protection:
Eye Protection:
Work/Hygienic Practices:

Ventilate as needed to comply with exposure limit.
Use impervious gloves to avoid repeated/prolonged skin contact.
Use goggles/face shield to avoid eye contact.
If clothing becomes contaminated, change to fresh clean clothing. Do not wear until thoroughly laundered.

SECTION 8 -- SPILL OR LEAK PROCEDURES

Spill Procedures:
Waste Disposal:

Remove ignition sources. Recover liquid.
Add absorbent to spill area. Ventilate confined spaces. Advise authorities if product enters sewers, etc.
Assure conformity with applicable disposal regulations. Dispose of absorbed material at approved waste site.

SECTION 9 -- SPECIAL PRECAUTIONS

Handling and Storage Precautions:

Keep containers closed when not in use. Do not handle or store near heat or flames. Use chemical resistant gloves and apron.

EMERGENCY FIRST AID PROCEDURES

Skin:
Eye:
Inhalation:

Wash skin with soap and warm water. Wash clothing before re-use.
If splashed into eyes flush eyes with clear water for five (5) minutes.
If overcome by fumes remove from exposure immediately.

For Husqvarna Parts Call 606-678-9623 or 606-561-4983
Oral: If ingested, do not induce vomiting. Call a physician.

The data presented herein is based upon tests and information, which we believe to be reliable.
However, users should make their own investigations to determine the suitability of the information for
their particular purpose.

Material Safety Data Sheet



JET B AVIATION TURBINE FUEL



1. Product and company identification

Product name	: JET B AVIATION TURBINE FUEL
Synonym	: Jet B; Jet B DI; JP-4; Jet F-40; NATO F-40; Turbine Fuel, Aviation, Wide Cut Type (Can/CGSB-3.22).
Code	: W219, SAP: 150, 151, 152
Material uses	: Used as aviation turbine fuel. May contain a fuel system icing inhibitor.
Manufacturer	: PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
<u>In case of emergency</u>	: Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2. Hazards identification

Physical state	: Clear liquid.
Odour	: Gasoline like.
WHMIS (Canada)	:   Class B-2: Flammable liquid Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOUR. FLAMMABLE. VAPOUR MAY CAUSE FLASH FIRE. CAUSES SKIN IRRITATION. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE BIRTH DEFECTS, BASED ON ANIMAL DATA. Extremely flammable liquid. Irritating to skin. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapour or mist. Avoid contact with eyes, skin and clothing. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure. Contains material which may cause birth defects, based on animal data. Avoid exposure during pregnancy. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
<u>Potential acute health effects</u>	
Inhalation	: 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	: Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.
Skin	: Irritating to skin.
Eyes	: May cause eye irritation.
<u>Potential chronic health effects</u>	
Chronic effects	: No known significant effects or critical hazards.
Carcinogenicity	: Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

2 . Hazards identification

Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: Contains material which may cause birth defects, based on animal data.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.
Medical conditions aggravated by over-exposure	: Repeated skin exposure can produce local skin destruction or dermatitis.

See toxicological information (section 11)

3 . Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Complex mixture of petroleum hydrocarbons (C6-C14)	64741-41-9	60 - 100
Benzene	71-43-2	0.1 - 0.5
Fuel System Icing Inhibitor (FSII) (if added**): (Diethylene Glycol Monomethyl Ether)	111-77-3	0.1 - 0.15
Anti-static, antioxidant, corrosion inhibitor and metal deactivator additives.	Not applicable	< 0.1

** Please note that Jet B DI, JP-4, Jet F-40 and NATO F-40 all contain Fuel System Icing Inhibitor (FSII). corrosion inhibitor

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact	: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
Skin contact	: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
Inhalation	: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Ingestion	: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
Notes to physician	: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product	: Flammable liquid (NFPA).
Extinguishing media	
Suitable	: Use dry chemical, CO ₂ , water spray (fog) or foam.
Not suitable	: Do not use water jet.
Special exposure hazards	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Products of combustion	: Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.

5 . Fire-fighting measures

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : Flammable in presence of open flames, sparks, and 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.
- Special remarks on explosion hazards** : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Benzene	ACGIH TLV (United States). Absorbed through skin. TWA: 0.5 ppm 8 hour(s). STEL: 2.5 ppm 15 minute(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hands

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Eyes

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin

: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state	: Clear liquid.
Flash point	: Closed cup: -31°C (-23.8°F) [NFPA]
Auto-ignition temperature	: 240°C (464°F) [NFPA]
Flammable limits	: Lower: 1.3% [NFPA] Upper: 8% [NFPA]
Colour	: Clear and colourless.
Odour	: Gasoline like.
Odour threshold	: Not available.
pH	: Not available.
Boiling/condensation point	: 50 to 270°C (122 to 518°F)
Melting/freezing point	: Not available.
Relative density	: 0.75 to 0.8 kg/L @ 15°C (59°F)
Vapour pressure	: 21.1 kPa (158 mm Hg) @ 37.8°C (100°F)
Vapour density	: 3.5 [Air = 1]
Volatility	: Not available.
Evaporation rate	: Not available.
Viscosity	: Not available.
Pour point	: Freezing point: <-51°C (<-60°F) for all types of Jet B including F40
Solubility	: Insoluble in water. Partially miscible in some alcohols. Miscible with other petroleum solvents.

10 . Stability and reactivity

Chemical stability	: The product is stable.
Hazardous polymerisation	: Under normal conditions of storage and use, hazardous polymerisation will not occur.
Materials to avoid	: Reactive with oxidising agents, diborane and halogen compounds.
Hazardous decomposition products	: May release COx, NOx, SOx, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Complex mixture of petroleum hydrocarbons (C6-C14)	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
Diethylene Glycol Monomethyl Ether	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	4000 mg/kg	-
	LC50 Inhalation Vapour	Rat	>50000 mg/m ³	4 hours
Benzene	LD50 Dermal	Rabbit	>9400 mg/kg	-
	LD50 Oral	Rat	930 mg/kg	-
	LC50 Inhalation Vapour	Rat	13200 ppm	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

11 . Toxicological information

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Complex mixture of petroleum hydrocarbons (C6-C14)	-	2A	-	-	-	-
Benzene	A1	1	A	+	Proven.	+

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.


13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1863	FUEL, AVIATION, TURBINE ENGINE	3	II		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Flammable liquid
Irritating material
Carcinogen

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

15 . Regulatory information

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

International regulations

- Canada inventory** : All components are listed or exempted.
- United States inventory (TSCA 8b)** : All components are listed or exempted.
- Europe inventory** : All components are listed or exempted.

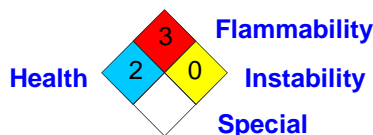
16 . Other information

- Label requirements** : EXTREMELY FLAMMABLE LIQUID AND VAPOUR. FLAMMABLE. VAPOUR MAY CAUSE FLASH FIRE. CAUSES SKIN IRRITATION. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE BIRTH DEFECTS, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

Health	*	2
Flammability		3
Physical hazards		0
Personal protection		H

National Fire Protection Association (U.S.A.) :



- References** : Available upon request.
TM/MC Marque de commerce de Petro-Canada - Trademark

Date of printing : 12/7/2009.

Date of issue : 7 December 2009

Date of previous issue : No previous validation.

Responsible name : Product Safety - DSR

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

1. PRODUCT AND COMPANY IDENTIFICATION

Product information

Trade name : OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Use of the Substance/Preparation Company : Insect Repellent

: S.C. Johnson and Son, Limited
1 Webster Street
Brantford ON N3T 5R1

Emergency telephone : 24 Hour Transport & Medical Emergency Phone (866) 231-5406
24 Hour International Emergency Phone (952) 852-4647
24 Hour Canadian Transport Emergency Phone (CANUTEC) (613) 996-6666

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance / Odor : light yellow / liquid / mild

Immediate Concerns

: WARNING
CAUSES EYE IRRITATION.
May be harmful if swallowed. Avoid contact with eyes and lips.

Potential Health Effects

Routes of exposure : Eye, Skin, Inhalation, Ingestion.

Eyes : May cause:
Moderate eye irritation

Skin : May cause skin reactions in rare cases.

Inhalation : None known.

Ingestion : May cause:
Abdominal discomfort.

Aggravated Medical Condition : None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Weight %
N,N-Diethyl-m-toluamide	134-62-3	98.25

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

4. FIRST AID MEASURES

- | | | |
|--------------|---|---|
| Eye contact | : | Flush immediately with plenty of water for at least 15 to 20 minutes. Remove contact lenses. Get medical attention immediately. |
| Skin contact | : | If you suspect a reaction to this product, discontinue use and remove contaminated clothing. Get medical attention immediately if irritation develops and persists. |
| Inhalation | : | Remove to fresh air. If breathing is affected, get medical attention. |
| Ingestion | : | Drink 1 or 2 glasses of water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Get medical attention immediately. |

5. FIRE-FIGHTING MEASURES

- | | | |
|---------------------------------------|---|---|
| Suitable extinguishing media | : | Alcohol foam, carbon dioxide, dry chemical, water fog |
| Specific hazards during fire fighting | : | Container may melt and leak in heat of fire. Material may burn in heat of fire. |
| Further information | : | Cool and use caution when approaching or handling fire-exposed containers. Wear full protective clothing and positive pressure self-contained breathing apparatus. Standard procedure for chemical fires. |
| Flash point | : | > 300 °F
Method: Tag Closed Cup (TCC) |
| Lower explosion limit | : | Note: no data available |
| Upper explosion limit | : | Note: no data available |

6. ACCIDENTAL RELEASE MEASURES

- | | | |
|---------------------------|---|---|
| Personal precautions | : | Remove all sources of ignition. |
| Environmental precautions | : | Use appropriate containment to avoid environmental contamination. |

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

Methods for cleaning up : Dike large spills.
Soak up with inert absorbent material.
Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Handling

Advice on safe handling : Use only as directed.
KEEP OUT OF REACH OF CHILDREN AND PETS.
Avoid contact with eyes and lips.

Storage

Requirements for storage areas and containers : Keep in a dry, cool and well-ventilated place.
Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

ACGIH or OSHA exposure limits have not been established for this product or reportable ingredients unless noted in the table above.

Personal protective equipment

Respiratory protection

Industrial setting : Substantial amounts of mist/vapors can be controlled with local exhaust ventilation or respiratory protection.

Household setting : No personal respiratory protective equipment normally required.

Hand protection

Industrial setting : For prolonged or repeated contact use protective gloves.

Household setting : not required under normal use

Eye protection

Industrial setting : If prolonged or repeated contact is possible:
Safety glasses with side-shields

Household setting : No special requirements.

Hygiene measures : Use only with adequate ventilation. Wash thoroughly after

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

handling. Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	:	liquid
Color	:	light yellow
Odor	:	mild
pH	:	not applicable
Boiling point	:	545 °F
Flash point	:	> 300 °F Method: Tag Closed Cup (TCC)
Evaporation rate	:	no data available
Autoignition temperature	:	no data available
Lower explosion limit	:	no data available
Upper explosion limit	:	no data available
Vapour pressure	:	no data available
Water solubility	:	negligible
Partition coefficient: n-octanol/water	:	no data available
Specific Gravity	:	1.0

10. STABILITY AND REACTIVITY

Conditions to avoid	:	Heat, flames and sparks.
Materials to avoid	:	Do not mix with oxidizing agents. Plastic Natural Rubber
Hazardous decomposition products	:	When exposed to fire, produces normal products of combustion.
Hazardous reactions	:	Stable

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50 rat
Dose: 2,170 - 3,664 mg/kg

Acute inhalation toxicity : LC50 rat
Dose: 5.95 mg/l

Acute dermal toxicity : LD50 rat
Dose: 4,223 mg/kg

Chronic effects

Carcinogenicity : no data available

Mutagenicity : no data available

Reproductive effects : no data available

Teratogenicity : no data available

Sensitisation : Not known to be a sensitizer.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects : Harmful to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Industrial setting : Observe all applicable Federal, Provincial and State regulations and Local/Municipal ordinances regarding disposal.

Household setting : Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

Land transport

U.S. DOT and Canadian TDG Surface Transportation:

UN-Number None.

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

Proper shipping name not regulated
Class: None.
Packaging group None.

Sea transport

IMDG:

UN-Number: None.
Packaging group: None.
Proper shipping name not regulated
Class: None.

Air transport

ICAO/IATA:

Class: None.
Packaging group: None.
Proper shipping name not regulated
UN/ID No.: None.

15. REGULATORY INFORMATION

Global Chemical Inventories

- Notification status : All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
- : All ingredients of this product comply with the New Substances Notification requirements under the Canadian Environmental Protection Act (CEPA).
- California Prop. 65 : This product is not subject to the reporting requirements under California's Proposition 65.
- : This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
- EPA Registration Number : 4822-276

Material Safety Data Sheet

according to ANSI Z400.1- 2004 and 29 CFR 1910.1200



OFF!® DEEP WOODS® SPORTSMEN INSECT REPELLENT I (PUMP SPRAY)

Version 1.

Print Date 01/06/2009

Revision Date 12/08/2008

MSDS Number 350000003959

16. OTHER INFORMATION

HMIS Ratings

Health	2
Flammability	1
Reactivity	0

NFPA Ratings

Health	2
Fire	1
Reactivity	0
Special	

Further information

This document has been prepared using data from sources considered to be technically reliable. It does not constitute a warranty, expressed or implied, as to the accuracy of the information contained herein. Actual conditions of use are beyond the seller's control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State, Provincial and Local laws and regulations.

Prepared by:	SC Johnson Global Safety Assessment & Regulatory Affairs (GSARA)
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Material Safety Data Sheet



DIESEL FUEL



1 . Product and company identification

Product name	: DIESEL FUEL
Synonym	: Seasonal Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, D50, D60, P40, P50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special, Biodiesel blend, B1, B2, B5, Diesel Low Cloud (LC).
Code	: W104, W293; SAP: 120, 121, 122, 125, 126, 129, 130, 135, 287, 288
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.
Manufacturer	: PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
<u>In case of emergency</u>	: Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state	: Bright oily liquid.
Odour	: Mild petroleum oil like.
WHMIS (Canada)	:   Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: WARNING! COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION. Combustible liquid. Severely irritating to the skin. Irritating to eyes. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapour or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
<u>Potential acute health effects</u>	
Inhalation	: 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	: Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.
Skin	: Severely irritating to the skin.
Eyes	: Irritating to eyes.
<u>Potential chronic health effects</u>	
Chronic effects	: No known significant effects or critical hazards.
Carcinogenicity	: Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.

2 . Hazards identification

- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Medical conditions aggravated by over-exposure** : 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.

See toxicological information (section 11)

3 . Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Kerosine (petroleum), hydrodesulfurized / Fuels, diesel / Fuel Oil No. 2	64742-81-0 / 68334-30-5 / 68476-30-2	95 - 100
Fatty acids methyl esters	61788-61-2 / 67784-80-9 / 73891-99-3	0 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

- Flammability of the product** : Combustible liquid
- Extinguishing media**
- Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Products of combustion** : Carbon oxides (CO, CO₂), nitrogen oxides (NO_x), sulphur oxides (SO_x), sulphur compounds (H₂S), smoke and irritating vapours as products of incomplete combustion.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

5 . Fire-fighting measures

- Special remarks on fire hazards** : Flammable in presence of open flames, sparks and 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.
- Special remarks on explosion hazards** : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Runoff to sewer may create fire or explosion hazard.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Kerosine (petroleum), hydrodesulfurized	ACGIH TLV (United States). Absorbed through skin. TWA: 200 mg/m ³ 8 hour(s).
Fuels, diesel	ACGIH TLV (United States). Absorbed through skin. TWA: 100 mg/m ³ , (Inhalable fraction and vapour) 8 hour(s).
Fuel oil No. 2	ACGIH TLV (United States). Absorbed through skin. TWA: 100 mg/m ³ , (Inhalable fraction and vapour) 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hands

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: nitrile, neoprene, polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Eyes

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin

: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state	: Bright oily liquid.
Flash point	: Diesel fuel: Closed cup: $\geq 40^{\circ}\text{C}$ ($\geq 104^{\circ}\text{F}$) Marine Diesel Fuel: Closed Cup: $\geq 60^{\circ}\text{C}$ ($\geq 140^{\circ}\text{F}$) Mining Diesel: Closed Cup: $\geq 52^{\circ}\text{C}$ ($\geq 126^{\circ}\text{F}$)
Auto-ignition temperature	: 225°C (437°F)
Flammable limits	: Lower: 0.7% Upper: 6%
Colour	: Clear to yellow (This product may be dyed red for taxation purposes).
Odour	: Mild petroleum oil like.
Odour threshold	: Not available.
pH	: Not available.
Boiling/condensation point	: 150 to 371°C (302 to 699.8°F)
Melting/freezing point	: Not available.
Relative density	: 0.80 to 0.88 kg/L @ 15°C (59°F)
Vapour pressure	: 1 kPa (7.5 mm Hg) @ 20°C (68°F).
Vapour density	: 4.5 [Air = 1]
Volatility	: Semivolatile to volatile.
Evaporation rate	: Not available.
Viscosity	: Diesel fuel: 1.3 - 4.1 cSt @ 40°C (104°F) Marine Diesel Fuel: 1.3 - 4.4 cSt @ 40°C (104°F)
Pour point	: Not available.
Solubility	: Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

10 . Stability and reactivity

Chemical stability	: The product is stable.
Hazardous polymerisation	: Under normal conditions of storage and use, hazardous polymerisation will not occur.
Materials to avoid	: Reactive with oxidising agents and acids.
Hazardous decomposition products	: May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Kerosine (petroleum), hydrodesulfurized	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation Vapour	Rat	>5000 mg/m ³	4 hours
Fuels, diesel	LD50 Dermal	Mouse	24500 mg/kg	-
	LD50 Oral	Rat	7500 mg/kg	-
Fuel oil No. 2	LD50 Oral	Rat	12000 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

11 . Toxicological information

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Kerosine (petroleum), hydrodesulfurized	A3	-	-	-	-	-
Fuels, diesel	A3	3	-	-	-	-
Fuel oil No. 2	A3	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.


13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1202	DIESEL FUEL	3	III		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Combustible liquid
Irritating material

Canada

WHMIS (Canada) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

15 . Regulatory information

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

International regulations

- Canada inventory** : All components are listed or exempted.
- United States inventory (TSCA 8b)** : All components are listed or exempted.
- Europe inventory** : All components are listed or exempted.

16 . Other information

Label requirements : COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	2
Physical hazards	0
Personal protection	H

National Fire Protection Association (U.S.A.) :



References : Available upon request.
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Responsible name : Product Safety - JDW

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

SUPREME™ 5W-20, 5W-30, 10W-30, 10W-40, 20W-50 MOTOR OIL



1. Product and company identification

Product name	: SUPREME™ 5W-20, 5W-30, 10W-30, 10W-40, 20W-50 MOTOR OIL
Code	: MOSP52, 410-348; MOSP53, 410-344; MOSP13, 410-341; MOSP14, 410-342; MOSP25, 410-343
Material uses	: Supreme motor oils are for use in all engines fuelled with gasoline, gasoline-ethanol blends up to E85, propane or CNG where the manufacturer recommends the use of API SN or SM quality oils. SAE 5W-20, 5W-30 and 10W-30 grades also meet the requirements of ILSAC GF-5 and GF-4.
Manufacturer	: Petro-Canada Lubricants Inc. 2310 Lakeshore Road West Mississauga, Ontario Canada L5J 1K2
<u>In case of emergency</u>	: Suncor Energy: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2. Hazards identification

Physical state	: Viscous liquid.
Odour	: Mild petroleum oil like.
WHMIS (Canada)	: Not controlled under WHMIS (Canada).
OSHA/HCS status	: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.
Emergency overview	: No specific hazard.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
<u>Potential acute health effects</u>	
Inhalation	: No known significant effects or critical hazards.
Ingestion	: No known significant effects or critical hazards.
Skin	: Slightly irritating to the skin.
Eyes	: Slightly irritating to the eyes.
<u>Potential chronic health effects</u>	
Chronic effects	: No known significant effects or critical hazards.
Carcinogenicity	: Not listed as carcinogenic by OSHA, NTP or IARC.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.
Medical conditions aggravated by over-exposure	: Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated skin exposure can produce local skin destruction or dermatitis.

See toxicological information (Section 11)

3 . Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Mixture of severely hydrotreated and hydrocracked base oil (petroleum).	Mixture	-

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

The base oil may be a mixture of the following CAS#s: 8042-47-5, 64742-46-7, 64742-47-8, 64742-53-6, 64742-54-7, 64742-55-8, 72623-84-8, 72623-85-9, 72623-86-0, 72623-87-1, 178603-64-0, 178603-65-1, 178603-66-2, 445411-73-4

4 . First-aid measures

Eye contact	: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
Skin contact	: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
Inhalation	: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Ingestion	: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product	: May be combustible at high temperature.
<u>Extinguishing media</u>	
Suitable	: Use an extinguishing agent suitable for the surrounding fire.
Not suitable	: None known.
Special exposure hazards	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Products of combustion	: Carbon oxides (CO, CO ₂), smoke and irritating vapours as products of incomplete combustion.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Special remarks on fire hazards	: Low fire hazard. This material must be heated before ignition will occur.
Special remarks on explosion hazards	: Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

6 . Accidental release measures

Personal precautions	: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
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6 . Accidental release measures

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Mixture of severely hydrotreated and hydrocracked base oil (petroleum).	ACGIH TLV (United States). Notes: (Mineral oil) TWA: 5 mg/m ³ , (Inhalable fraction) 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour filter

8 . Exposure controls/personal protection

- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: neoprene, nitrile, polyvinyl alcohol (PVA), Viton®.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

- Physical state** : Viscous liquid.
- Flash point** : Closed cup: $\geq 204^{\circ}\text{C}$ ($\geq 399.2^{\circ}\text{F}$) [Pensky-Martens.]
Open cup: $\geq 219^{\circ}\text{C}$ ($\geq 426.2^{\circ}\text{F}$) [Cleveland.]
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Colour** : Light amber.
- Odour** : Mild petroleum oil like.
- Odour threshold** : Not available.
- pH** : Not available.
- Boiling/condensation point** : Not available.
- Melting/freezing point** : Not available.
- Relative density** : 0.855 to 0.876 kg/L @ 15°C (59°F)
- Vapour pressure** : Not available.
- Vapour density** : Not available.
- Volatility** : Not available.
- Evaporation rate** : Not available.
- Viscosity** : **5W-20**: 47.3 cSt @ 40°C (104°F), 8.4 cSt @ 100°C (212°F), VI=153;
5W-30: 62.3 cSt @ 40°C (104°F), 10.7 cSt @ 100°C (212°F), VI=163;
10W-30: 67.7 cSt @ 40°C (104°F), 10.4 cSt @ 100°C (212°F), VI=141;
10W-40: 105.4 cSt @ 40°C (104°F), 15.4 cSt @ 100°C (212°F), VI=154;
20W-50: 159.1 cSt @ 40°C (104°F), 17.88 cSt @ 100°C (212°F), VI=124
- Pour point** : **5W-20**: -48°C (-54°F); **5W-30**: -42°C (-44°F); **10W-30**: -45°C (-49°F); **10W-40**: -42°C (-44°F); **20W-50**: -18°C (0°F)
- Solubility** : Insoluble in water.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Hazardous polymerisation** : Under normal conditions of storage and use, hazardous polymerisation will not occur.
- Materials to avoid** : Reactive with oxidising agents, reducing agents, acids and alkalis.
- Hazardous decomposition products** : May release COx, H₂S, metal oxides, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Mixture of severely hydrotreated and hydrocracked base oil (petroleum).	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation	Rat	>5.2 mg/l	4 hours
	Dusts and mists			

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Mixture of severely hydrotreated and hydrocracked base oil (petroleum).	A4	-	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	Not regulated.	-	-	-		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Not regulated.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

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

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : At least one component is not listed in EINECS but all such components are listed in ELINCS.
Please contact your supplier for information on the inventory status of this material.

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

16 . Other information

Hazardous Material Information System (U.S.A.) :

Health	1
Flammability	1
Physical hazards	0
Personal protection	B

National Fire Protection Association (U.S.A.) :



References

: Available upon request.
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Responsible name : Product Safety - RS

Indicates information that has changed from previously issued version.

16 . Other information

For Copy of (M)SDS

: The Canadian Controlled Products Regulations (CPR) (Under the Hazardous Products Act, part of the WHMIS legislation) only apply to WHMIS Controlled (i.e., hazardous) products. Therefore, the CPR and the 3-year update rule specified therein do not apply to WHMIS Non-Controlled products. Although this is true, customarily Petro-Canada reviews and updates Non-Controlled product MSDS if a customer requests such an update. These Non-Controlled product updates are given a lower priority than Controlled products but are handled as soon as practicable. If you would like to verify if the MSDS you have is the most current, or you require any further information, please contact:

Internet: lubricants.petro-canada.ca/msds

Lubricants:

Western Canada, telephone: 1-800-661-1199; fax: 1-800-378-4518

Ontario & Central Canada, telephone: 1-800-268-5850; fax: 1-800-201-6285

Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 1-800-201-6285

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet



GASOLINE, UNLEADED



1 . Product and company identification

Product name	: GASOLINE, UNLEADED
Synonym	: Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending
Code	: W102E, SAP: 102 to 117
Material uses	: Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.
Manufacturer	: PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
<u>In case of emergency</u>	: Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state	: Clear liquid.
Odour	: Gasoline
WHMIS (Canada)	:   Class B-2: Flammable liquid Class D-2A: Material causing other toxic effects (Very toxic). Class D-2B: Material causing other toxic effects (Toxic).
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: WARNING! FLAMMABLE LIQUID AND VAPOUR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CONTAINS MATERIAL WHICH CAN CAUSE HERITABLE GENETIC EFFECTS. Flammable liquid. Irritating to eyes, respiratory system and skin. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapour or mist. Avoid contact with eyes, skin and clothing. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure. Contains material which can cause heritable genetic effects. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
<u>Potential acute health effects</u>	
Inhalation	: Inhalation of this product may cause respiratory tract irritation. 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	: 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.

2 . Hazards identification

Skin	: Irritating to skin.
Eyes	: Irritating to eyes.
<u>Potential chronic health effects</u>	
Chronic effects	: This product contains an ingredient or ingredients, which have been shown to cause chronic toxic effects. Repeated or prolonged exposure to the substance can produce blood disorders.
Carcinogenicity	: Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	: Contains material which can cause heritable genetic effects.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.
Medical conditions aggravated by over-exposure	: Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated skin exposure can produce local skin destruction or dermatitis.

See toxicological information (section 11)

3 . Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Gasoline	86290-81-5	85-100
Ethanol	64-17-5	0.1-1
Benzene	71-43-2	0.5-1.5
Toluene	108-88-3	15-40*

*Montreal: may vary from 3-40%

*Edmonton: may vary from 1-5%

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact	: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
Skin contact	: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
Inhalation	: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Ingestion	: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
Notes to physician	: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product	: Flammable liquid (NFPA) .
Extinguishing media	
Suitable	: Use dry chemical, CO ₂ , water spray (fog) or foam.
Not suitable	: Do not use water jet.
Special exposure hazards	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Products of combustion	: Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), polynuclear aromatic hydrocarbons, phenols, aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Special remarks on fire hazards	: Extremely flammable in presence of open flames, sparks, shocks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.
Special remarks on explosion hazards	: Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.

6 . Accidental release measures

Personal precautions	: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
Environmental precautions	: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Methods for cleaning up	
Small spill	: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
Large spill	: Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling	: Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical
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7 . Handling and storage

(ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

- : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Gasoline	ACGIH TLV (United States). TWA: 300 ppm 8 hour(s). STEL: 500 ppm 15 minute(s).
Ethanol	ACGIH TLV (United States). STEL: 1000 ppm 15 minute(s).
Benzene	ACGIH TLV (United States). Absorbed through skin. TWA: 0.5 ppm 8 hour(s). STEL: 2.5 ppm 15 minute(s).
Toluene	ACGIH TLV (United States). TWA: 20 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

- : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

- : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures

- : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

- : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

8 . Exposure controls/personal protection

- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: polyvinyl alcohol (PVA), Viton. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

- Physical state** : Clear liquid.
- Flash point** : Closed cup: -50 to -38°C (-58 to -36.4°F) [Tagliabue.]
- Auto-ignition temperature** : 257°C (494.6°F) (NFPA)
- Flammable limits** : Lower: 1.3% (NFPA)
Upper: 7.6% (NFPA)
- Colour** : Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
- Odour** : Gasoline
- Odour threshold** : Not available.
- pH** : Not available.
- Boiling/condensation point** : 25 to 220°C (77 to 428°F) (ASTM D86)
- Melting/freezing point** : Not available.
- Relative density** : 0.685 to 0.8 kg/L @ 15°C (59°F)
- Vapour pressure** : <107 kPa (<802.5 mm Hg) @ 37.8°C (100°F)
- Vapour density** : 3 to 4 [Air = 1] (NFPA)
- Volatility** : Not available.
- Evaporation rate** : Not available.
- Viscosity** : Not available.
- Pour point** : Not available.
- Solubility** : Hydrocarbon components virtually insoluble in water. Soluble in alcohol, ether, chloroform and benzene. Dissolves fats, oils and natural resins.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Hazardous polymerisation** : Under normal conditions of storage and use, hazardous polymerisation will not occur.
- Materials to avoid** : Reactive with oxidising agents, acids and interhalogens.
- Hazardous decomposition products** : May release CO_x, NO_x, phenols, polycyclic aromatic hydrocarbons, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Gasoline	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	13600 mg/kg	-
Ethanol	LD50 Dermal	Rabbit	>15800 mg/kg	-
	LD50 Oral	Mouse	3450 mg/kg	-
	LC50 Inhalation Vapour	Rat	8850 mg/m ³	4 hours
Benzene	LD50 Dermal	Rabbit	>8240 mg/kg	-
	LD50 Oral	Rat	930 mg/kg	-
	LC50 Inhalation Vapour	Rat	13228 ppm	4 hours
Toluene	LD50 Dermal	Rabbit	12125 mg/kg	-
	LD50 Oral	Rat	636 mg/kg	-
	LC50 Inhalation Vapour	Rat	7585 ppm	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Gasoline	A3	2B	-	-	-	-
Ethanol	A3	-	-	-	-	-
Benzene	A1	1	A	+	Proven.	+
Toluene	A4	3	D	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : There is a wealth of information about the teratogenic hazards of Toluene in the literature; however, based upon professional judgement regarding the body of evidence, WHMIS classification as a teratogen is not warranted.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.


13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1203	GASOLINE	3	II		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Flammable liquid
Irritating material
Carcinogen

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

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

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

16 . Other information

Label requirements : FLAMMABLE LIQUID AND VAPOUR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CONTAINS MATERIAL WHICH CAN CAUSE HERITABLE GENETIC EFFECTS.

Hazardous Material Information System (U.S.A.) :

Health	*	2
Flammability		3
Physical hazards		0
Personal protection		H

16 . Other information

National Fire Protection :
Association (U.S.A.)



References : Available upon request.
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Date of printing : 4/21/2010.

Date of issue : 9 April 2010

Date of previous issue : No previous validation.

Responsible name : Product Safety - RS

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

PROPANE



1 . Product and company identification

Product name	: PROPANE
Synonym	: Propane HD-5, Propane commercial, Liquified Petroleum Gas (LPG), C3H8, CGSB Propane Grade 1, CGSB Propane Grade 2, odourized propane, stench propane, automotive propane.
Code	: W222
Material uses	: Propane is used as a fuel gas, refrigerant and as a raw material for organic synthesis. It is also used as a laboratory gas. The grade determines the propane content. It is supplied as pressurized liquid in tanks.
Manufacturer	: PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
<u>In case of emergency</u>	: Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state	: Gas at room temperature; liquid when stored under pressure.
Odour	: Propane is an odourless gas. Odourized propane will contain up to 28 g Ethyl Mercaptan per 1000 L of propane.
WHMIS (Canada)	: Class A: Compressed gas. Class B-1: Flammable gas.
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	: CAUTION! EXTREMELY FLAMMABLE GAS. MAY CAUSE FLASH FIRE. HIGH PRESSURE GAS. Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst or explode. Keep away from heat, sparks and flame. Do not puncture or incinerate container. Avoid breathing gas. Avoid contact with skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. At high concentrations, can displace oxygen and cause asphyxiation. A minimum requirement of 19.5% of oxygen at sea level (148 torr O2, dry air) is recommended.
Routes of entry	: Dermal contact. Eye contact. Inhalation.
<u>Potential acute health effects</u>	
Inhalation	: 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	: As this product is a gas, refer to the inhalation section.
Skin	: Contact with rapidly expanding gas may cause burns or frostbite.
Eyes	: Contact with rapidly expanding gas may cause burns or frostbite.
<u>Potential chronic health effects</u>	
Chronic effects	: No known significant effects or critical hazards.
Carcinogenicity	: Not listed as carcinogenic by OSHA, NTP or IARC.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

2 . Hazards identification

Medical conditions aggravated by over-exposure : Overexposure may lead to cardiac sensitization.

See toxicological information (section 11)

3 . Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
HD-5 Propane		
Propane	74-98-6	90 - 100
Propene	115-07-1	1 - 5
Commercial Propane		
Propane	74-98-6	75 - 100
Propene	115-07-1	10 - 20
Both grades may contain:		
Ethane	74-84-0	3 - 6*
*Montreal: may vary from 0.1-2%		
Butane+	106-97-8	1 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact	: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
Skin contact	: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
Inhalation	: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Ingestion	: As this product is a gas, refer to the inhalation section.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Notes to physician	: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product	: Class I - flammable gas (NFPA).
Extinguishing media	
Suitable	: Use an extinguishing agent suitable for the surrounding fire.
Not suitable	: None known.
Special exposure hazards	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance.
Products of combustion	: Carbon oxides (CO, CO ₂), smoke and irritating vapours as products of incomplete combustion.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

5 . Fire-fighting measures

- Special remarks on fire hazards** : Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.
- Special remarks on explosion hazards** : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Containers may explode in heat of fire. Vapour explosion hazard indoors, outdoors or in sewers. Propane may form explosive mixtures with air.

6 . Accidental release measures

- Personal precautions** : Accidental releases pose a serious fire or explosion hazard. Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.
- SPECIAL PRECAUTIONS: Sludges and tank scale from petroleum storage tanks, trucks, rail cars, and filters/screens may contain naturally occurring radioactive material ("NORM") in the dominant form of radon 226. Similarly, equipment used for the transfer of petroleum product such as pipelines, pumps and compressors, may have detectable levels of radioactive radon on inner surfaces. Workers involved in cleaning, descaling, repair or other maintenance on inner surfaces of such equipment should avoid breathing and ingesting of dust generated from such activities. Suitable codes of practice should be developed for these activities, detailing appropriate occupational hygiene, personal protective equipment and disposal practices.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Propane	ACGIH TLV (United States). TWA: 1000 ppm 8 hour(s).
Propylene	ACGIH TLV (United States). TWA: 500 ppm 8 hour(s).
Ethane	ACGIH TLV (United States). TWA: 1000 ppm 8 hour(s).
Butane	ACGIH TLV (United States). TWA: 1000 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: NIOSH-approved self-contained breathing apparatus.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: Wear insulated gloves to prevent frostbite.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state	: Gas at room temperature; liquid when stored under pressure.
Flash point	: Closed cup: -104°C (-155.2°F)
Auto-ignition temperature	: 450°C (842°F) (NFPA)
Flammable limits	: Lower: 2.1% (NFPA) Upper: 9.5% (NFPA)
Colour	: Colourless.
Odour	: Propane is an odourless gas. Odourized propane will contain up to 28 g Ethyl Mercaptan per 1000 L of propane.
Odour threshold	: Not available.
pH	: Not available.

9 . Physical and chemical properties

Boiling/condensation point	: -42°C (-43.6°F)
Melting/freezing point	: Not available.
Relative density	: Not available.
Vapour pressure	: 1434.9 kPa (10763 mm Hg) @ 38°C (100°F)
Vapour density	: 1.56 [Air = 1]
Volatility	: Volatile.
Evaporation rate	: Not available.
Viscosity	: Not available.
Pour Point	: Not available.
Solubility	: Not available.

10 . Stability and reactivity

Chemical stability	: The product is stable.
Hazardous polymerisation	: Under normal conditions of storage and use, hazardous polymerisation will not occur.
Materials to avoid	: Reactive with oxidising agents and halogenated compounds.
Hazardous decomposition products	: May release COx, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Butane	LC50 Inhalation Gas.	Rat	658000 mg/m ³	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Propylene	A4	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.


13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Do not puncture or incinerate container. Empty pressure vessels should be returned to the supplier.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1978	PROPANE	2.1	-		-
DOT Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Compressed gas

Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.

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

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

16 . Other information

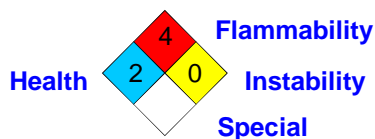
Label requirements : EXTREMELY FLAMMABLE GAS. MAY CAUSE FLASH FIRE. HIGH PRESSURE GAS.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	4
Physical hazards	2
Personal protection	K

16 . Other information

National Fire Protection Association (U.S.A.) :



References : Available upon request.
TM/MC Marque de commerce de Petro-Canada - Trademark

Date of printing : 7/13/2009.

Date of issue : 31 March 2009

Date of previous issue : No previous validation.

Responsible name : Product Safety - DSR

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Yamalube 2-W Two Cycle Engine Oil

Material Safety Data Sheet

CITGO Petroleum Corporation
P.O. Box 3758
Tulsa, OK 74102-3758

MSDS No. 625462324

Revision Date 02/20/2003

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Emergency Overview

Physical State Liquid.
Color Purple. **Odor** Mild petroleum odor

WARNING:

Contains Petroleum Distillates. Harmful if swallowed - Can enter lungs and cause damage.

If swallowed, DO NOT induce vomiting. Call a physician immediately.

Combustible Liquid.

Heated material can release vapor that can cause flash fire or ignite with explosive force.

Vapor or mists can cause mucous membrane and respiratory tract irritation.

Spills may create a slipping hazard.

Hazard Rankings

	HMIS	NFPA
Health Hazard	* 1	1
Fire Hazard	2	2
Reactivity	0	0

* = Chronic Health Hazard

Protective Equipment

Minimum Recommended
See Section 8 for Details



SECTION 1: IDENTIFICATION

Trade Name	Yamalube 2-W Two Cycle Engine Oil	Technical Contact	(800) 248-4684
Product Number	625462324	Medical Emergency	(918) 495-4700
CAS Number	Mixture.	CHEMTREC Emergency (United States Only)	(800) 424-9300
Product Family	Two cycle engine oil		
Synonyms	Two cycle engine oil; Air-cooled 2-Stroke Engine Oil; CITGO SAP Product Code No.: 625462324		

SECTION 2: COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
1) Distillates, petroleum, solvent-refined heavy paraffinic	64741-88-4	40 - 60
2) Petroleum hydrocarbon distillates	8052-41-3	10 - 30
3) Polybutene	9003-29-6	5 - 20
4) Proprietary Ingredients	Proprietary Mixture	5 - 20
5) Residual oils, petroleum, solvent-refined	64742-01-4	1 - 5

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact.

Signs and Symptoms of Acute Exposure

Inhalation	At elevated temperatures or in enclosed spaces, product mist or vapors may irritate the mucous membranes of the nose, the throat, bronchi, and lungs.
Eye Contact	This product can cause eye irritation with short-term contact with liquid, mists or vapor. Symptoms include stinging, watering, redness, and swelling.
Skin Contact	This material can cause skin irritation with short-term exposure. The degree of irritation will depend on the amount of material that is applied to the skin and the speed and thoroughness that it is removed. Signs and symptoms can include pain, sensation of heat, discoloration, swelling or blistering. Repeated and prolonged skin contact can produce irritation and inflammation.
Ingestion	If swallowed, large volumes of material can cause generalized depression, headache, drowsiness, nausea, vomiting and diarrhea. Smaller doses can cause a laxative effect. If aspirated into the lungs, liquid can cause lung damage.
Chronic Health Effects Summary	Prolonged and/or repeated skin contact may cause irritation and inflammation. Symptoms include defatting, redness, dryness, blistering eczema-like lesions, scaly dermatitis, and/or more serious skin disorders. Chronic effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction.
Conditions Aggravated by Exposure	Medical conditions aggravated by exposure to this material may include pre-existing disorders of the skin, central nervous system, respiratory system, liver and/or kidney.
Target Organs	This material may cause damage to the following organs: upper respiratory tract, skin, eyes.
Carcinogenic Potential	This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification			
Irritant	<input type="checkbox"/>	Toxic	<input type="checkbox"/>	Combustible	<input checked="" type="checkbox"/>	Explosive	<input type="checkbox"/>
Sensitizer	<input type="checkbox"/>	Highly Toxic	<input type="checkbox"/>	Flammable	<input type="checkbox"/>	Oxidizer	<input type="checkbox"/>
Corrosive	<input type="checkbox"/>	Carcinogenic	<input type="checkbox"/>	Compressed Gas	<input type="checkbox"/>	Organic Peroxide	<input type="checkbox"/>
						Pyrophoric	<input type="checkbox"/>
						Water-reactive	<input type="checkbox"/>
						Unstable	<input type="checkbox"/>

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation	Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.
Eye Contact	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Skin Contact	If burned by hot material, cool skin by quenching with large amounts of cool water. For contact with product at ambient temperatures, remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately.

Yamalube 2-W Two Cycle Engine Oil

Ingestion	Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. If significant amounts are swallowed or irritation or discomfort occurs, seek medical attention immediately.
Notes to Physician	The viscosity range of the product represented by this MSDS is 100 to 400 SUS at 100° F. Accordingly, upon ingestion there is a low to moderate risk of aspiration. Careful gastric lavage may be considered to evacuate large quantities of material. Subcutaneous or intramuscular injection requires prompt surgical debridement.

SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification	NFPA Class-III-A combustible liquid. Moderately combustible.		
Flash Point Method	CLOSED CUP: 69°C (156.°F). (Pensky-Martens (ASTM D-93).) OPEN CUP: 96°C (205°F) (Cleveland.).		
Lower Flammable Limit	No data.	Upper Flammable Limit	No data.
Autoignition Temperature	Not available.		
Hazardous Combustion Products	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur and/or nitrogen.		
Special Properties	This material will release vapors when heated above the flash point temperature that can ignite when exposed to a source of ignition. In enclosed spaces, vapors can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point.		
Extinguishing Media	SMALL FIRE: Use dry chemicals, carbon dioxide, foam, water fog, or inert gas (nitrogen). LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.		
Protection of Fire Fighters	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines.		

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulation

SECTION 7: HANDLING AND STORAGE

Handling	Avoid contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.
Storage	Keep container closed. Store in a cool, dry, well-ventilated area. Do not store with oxidizing agents. Do not store at elevated temperatures or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station.
Personal Protective Equipment	Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



Eye Protection	Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available.
Hand Protection	Avoid skin contact. Use gloves (e.g., disposable PVC, neoprene, nitrile, vinyl, or PVC/NBR). Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.
Body Protection	Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.
Respiratory Protection	Vaporization is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).
General Comments	Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.

Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels
1) Oil Mist, Mineral	ACGIH (United States). TWA: 5 mg/m ³ STEL: 10 mg/m ³ OSHA (United States). TWA: 5 mg/m ³
2) Petroleum hydrocarbon distillates	ACGIH TLV (United States). TWA: 100 ppm OSHA PEL Z2 (United States). TWA: 500 ppm

Yamalube 2-W Two Cycle Engine Oil

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

Physical State	Liquid.	Color	Purple.	Odor	Mild petroleum odor
Specific Gravity	0.86 (Water = 1)	pH	Not Applicable.	Vapor Density	>1 (Air = 1)
Boiling Point/Range	Not available.			Melting/Freezing Point	Not available.
Vapor Pressure	<0.1 kPa (<1 mmHg) (at 20°C)			Viscosity (cSt @ 40°C)	38
Solubility in Water	Insoluble in cold water.			Volatile Characteristics	AP 190 g/l VOC (W/V)
Additional Properties	Gravity, °API (ASTM D287) = 32.5 @ 60° F Density = 7.16 Lbs/gal. Viscosity (ASTM D2161) = 194 SUS @ 100° F				

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability	Stable.	Hazardous Polymerization	Not expected to occur.
Conditions to Avoid	Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions.		
Materials Incompatibility	Strong oxidizers.		
Hazardous Decomposition Products	No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.		

SECTION 11: TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data	Distillates, petroleum, solvent-refined heavy paraffinic:
	ORAL (LD50): Acute: >5000 mg/kg [Rat].
	DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].
	Residual oils, petroleum, solvent-refined:
	ORAL (LD50): Acute: >5000 mg/kg [Rat].
	DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].
	Stoddard Solvent:
	DERMAL (LD50): Acute: >3000 mg/kg [Rabbit].
	INHALATION (LC50): Acute: >5.5 mg/l 8 hour(s) [Rat].
	Distillates, petroleum, solvent-refined heavy paraffinic:
	Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested. Analyses conducted by method IP 346 indicate that the polycyclic aromatic concentration of this mineral oil is below 3.0 weight percent.
	Residual oils, petroleum, solvent-refined:
	Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.
	Stoddard Solvent:

Yamalube 2-W Two Cycle Engine Oil

Studies on laboratory animals have associated similar materials with eye and respiratory tract irritation. Studies on laboratory animals have shown similar materials to cause skin irritation after repeated or prolonged contact. Repeated direct application of Stoddard Solvent to the skin can produce defatting dermatitis and kidney damage in laboratory animals. Rats developed kidney damage and elevated blood urea nitrogen levels when exposed to a concentration of 1.9 mg/L for 65 days. The kidney damage occurred only in male rats and appeared to involve both the tubules and glomeruli. The significance of these animal study results to human health is unclear.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.
Environmental Fate	An environmental fate analysis has not been conducted on this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

SECTION 14: TRANSPORT INFORMATION

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.

US DOT Status	A U.S. Department of Transportation regulated material.		
Proper Shipping Name	Combustible liquid, n.o.s. (contains Petroleum Distillates) [This product has a flash point temperature between 61° to 93°C (141° and 200°F). For bulk shipments, it is classified as a US DOT "Combustible Liquid." According to 49 CFR 173.150 (f)(2), certain transportation-related requirements, such as labeling, may not apply to this product when shipped in non-bulk packaging (e.g., less than 119 gallons capacity). However, pursuant to 49 CFR 173.150 (b) limited-quantities offered for or transported via aircraft may be subject to US DOT regulation.]		
Hazard Class	Combustible Liquid.	Packing Group(s)	III
		UN/NA ID	NA 1993
Reportable Quantity	A Reportable Quantity (RQ) has not been established for this material.		
Placards			

Yamalube 2-W Two Cycle Engine Oil



Emergency Response Guide No.	128
HAZMAT STCC No.	4915378
MARPOL III Status	Not a DOT "Marine Pollutant" per 49 CFR 171.8.

SECTION 15: REGULATORY INFORMATION

TSCA Inventory	This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.
SARA 302/304	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: Fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard
SARA 313	This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are: None identified.
CWA	This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
California Proposition 65	This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): Toluene: 0.0003%
New Jersey Right-to-Know Label	Petroleum Oil (Two Cycle Engine Oil)
Additional Regulatory Remarks	No additional regulatory remarks.

SECTION 16: OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number	3.0
Revision Date	02/20/2003
Print Date	Printed on 02/20/2003.

ABBREVIATIONS

AP: Approximately EQ: Equal >: Greater Than <: Less Than NA: Not Applicable ND: No Data NE: Not Established

Yamalube 2-W Two Cycle Engine Oil

ACGIH: American Conference of Governmental Industrial Hygienists
IARC: International Agency for Research on Cancer
NIOSH: National Institute of Occupational Safety and Health
NPCA: National Paint and Coating Manufacturers Association
NFPA: National Fire Protection Association

AIHA: American Industrial Hygiene Association
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
HMIS: Hazardous Materials Information System
EPA: US Environmental Protection Agency

DISCLAIMER OF LIABILITY

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THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE, AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

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

MATERIAL SAFETY DATA SHEET

SECTION I – PRODUCT INFORMATION

Product Name: Propane

Trade Name: LPG (Liquefied Petroleum Gas)

Chemical Formula: C₃H₈

WHMIS Classification: Class A – Compressed Gas
Class B, Division I – Flammable Gas

Supplier:

Business:

Non Medical Emergency:

Uses and Occurrence: Propane is commonly used as fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT

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

SECTION II – HAZARDOUS INGREDIENTS

Components	CAS Registry No.	Proportion of Product	LC50	LD50
Propane	74-98-6	95% - 98%	N/A	N/A
Ethane	74-84-0	3% - 5%	N/A	N/A
Butane	106-97-8	1% - 3%	N/A	N/A
Iso-Butane	75-28-5	0.1% - 0.3%	N/A	N/A
Methane	74-82-8	0.1% - 0.2%	N/A	N/A

Note: Composition given is typical for Grade 1 Propane; exact composition will vary from shipment to shipment.

- Explanation for change – HD5 refers to American specification, Grade 1 is Canadian equivalent in CGSB 3.14 Standard

SECTION III – CHEMICAL AND PHYSICAL DATA

Form: While stored under pressure – liquid and/or vapour

Boiling Point: -42 °C atm

Freezing Point: -188 °C

Evapouration Rate: Rapid (Gas at Normal Ambient Conditions)

Vapour Pressure: 1,013 (kPa) @ 26.0 °C

Vapour Density: 1.52 (Air = 1)

Coefficient of Water/Oil Distribution: Not available

PH: Not available

Soluble in Water: 6.1% by Volume @ 17.8 °C and 753 mmHg

Specific Gravity: 0.51 (Water = 1)

Appearance: Colourless liquid and vapour while stored under pressure.

Colourless and odourless gas in natural state at any concentration.

Commercial propane has an odourant added which is commonly ethyl mercaptan which has an odour similar to boiling cabbage or rotten eggs.

Odour Threshold: 4800 PPM

See Note 1 - Odourants

SECTION IV – FIRE OR EXPLOSION HAZARD DATA

Flash Point: -103.4 °C **Method:** Closed Cup

Flammable Limits: Lower 2.4%, Upper 9.5%

Auto Ignition Temperature: 432 °C

Products Evolved Due to Heat or Combustion:

Carbon monoxide can be produced when primary and secondary airs are deficient while combustion is taking place.

Fire and Explosive Hazards: Explosive air-vapour mixtures may form if allowed to leak to atmosphere.

Sensitivity to Impact: No

Sensitivity to Static Discharge: Yes

Fire Extinguishing Precautions: Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fuelling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent flame impingement and the weakening of metal. If weakening, the area must be evacuated. If gas has not ignited, liquid and vapour may be dispersed by water spray or flooding.

Special Fire Fighting Equipment: Protective clothing, hose monitors, fog nozzles, self contained breathing apparatus.

SECTION V – REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Keep separate from oxidizing agents. Gas explodes spontaneously when mixed with chlorine dioxide.

Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks

from combustible material, drains, and openings to buildings.

Hazardous Decomposition Products: Deficient primary and secondary air can produce carbon monoxide.

Hazardous Polymerization: Will not occur.

SECTION VI – TOXICOLOGICAL PROPERTIES OF MATERIAL

ACUTE EXPOSURE:

Eyes: As a gas, none, Liquid causes “cold burns”.

Respiratory System: Little physiological effect at concentrations below 10,000 PPM. Higher concentrations may cause dizziness and unconsciousness due to asphyxiation. *SEE*

NOTE 2 – ASPHYXIAN.

Chronic Exposure: There are no reported effects from long-term low-level exposure.

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

Sensitization Properties: Skin – unknown,

Respiratory – unknown.

Carcinogenicity: Not determined. *SEE NOTE 3 (NORM).*

MEDIAN LETHAL DOSE:

Oral: Not applicable for gas.

Inhalation: Not determined.

Dermal: Not applicable for gas.

Other: Not determined.

IRRITATION INDEX:

Skin: No appreciable effect (gas).

Eyes: No appreciable effect (gas).

Symptoms of Exposure: Above 10,000 PPM – dizziness, stupor, unconsciousness. *SEE NOTE 2 attached.* American Conference of Governmental Industrial Hygienists (ACGIH) classifies propane as an asphyxiate; there is no recommended “Threshold Limit Value” (TLV).

Teratogenicity: Not determined.

Mutagenicity: Not determined.

SECTION VII – OCCUPATION CONTROL PROCEDURES

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

Skin: Insulated gloves if contact with liquid or liquid cooled equipment is expected. Wear gloves and long sleeves when transferring product.

Inhalation: In atmosphere, where the concentration of propane would reduce oxygen

level below 18% in inhaled air, self contained breathing apparatus required. *SEE NOTE 3 – (NORM).*

Ventilation: Explosion proof ventilation equipment required in confined spaces.

SECTION VIII – EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:

Eyes: Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Obtain immediate medical care.

Skin: In case of “Cold Burn” from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical care.

SPILL OR LEAK:

Eliminate leak if possible.

Eliminate source of ignition.

Ensure cylinder is upright.

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

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

SECTION IX – TRANSPORTATION, HANDLING AND STORAGE

- Transport and store cylinders and tanks secured in an upright position in a ventilated space, away from ignition sources (so relief valve is in contact with vapour space of cylinder or tank).
 - Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap or guard.
 - Do not store with oxidizing agents, oxygen or chlorine cylinders.
- Transport, handle and store according to applicable federal and provincial regulations (CGA B149.2). **SEE NOTE 4 – MAGNETIC RESIDUES.**
- TDG Classification:** 2.1 (gas)
TDG Shipping Name: Liquid Petroleum Gas (Propane)
TDG Special Provisions: 56, 90, and 102
PIN UN: 1075

SECTION X – PREPARATION INFORMATION
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Prepared by: Propane Gas Association of Canada
 (403) 543-6500

Date prepared: November 2010

The information contained herein is believed to be accurate. It is provided independently of any sale of the product. It is not intended to constitute performance information concerning the product. No express warranty or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product information contained herein.

This information is in addition to the information supplied on the MSDS and forms a part of the MSDS by reference to note numbers indicated:

NOTE 1 ODOURANTS:

Odourants are not completely effective warning agents in all cases.

Certain odourants are polar and/or chemically reactive and may be depleted by reaction or absorption.

Sensitivity to odourants differs from person to person and may decrease with age or impaired physical conditions such as colds or respiratory allergies.

Prolonged exposure to odourants can create desensitization to the odour.

NOTE 2 ASPHYXIAN AND NARCOTIC EFFECTS OF PROPANE:

LPG's can displace air and can act as an asphyxiant. Lack of oxygen may cause dizziness, headaches, diminished awareness, faulty judgment, increase in fatigue and impaired muscular coordination. If these symptoms are identified while working in close proximity to propane that is released, go immediately into a fresh air environment.

LPG's are anaesthetic gases within the upper explosive limits and higher concentrations. A person working around propane in an enclosed space or in close proximity to a propane source such as filling cylinders, purging lines, investigating leaks, etc. who feels light-headed, dizzy, drunken, sleepy, or intoxicated should go immediately into fresh air. This narcotic effect may impair a person's judgment temporarily but will rapidly disappear in fresh air.

NOTE 3 NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM):

Sludges and tank scale from propane storage tanks, bulk delivery truck tanks, railway tank cars, and fuel filters and strainers screens may contain Naturally Occurring Radioactive Material (NORM) in the form of lead 210.

Equipment used for the transfer of propane such as propane piping and hoses, pumps and compressors may have detectable levels of radioactive lead 210 on inner surfaces.

Workers involved in cleaning, repair or maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities. Suitable codes of practice should be developed for the activities, detailing appropriate occupational hygiene and disposal practices.

NOTE 4 MAGNETIC RESIDUES IN PROPANE:

Magnetic residues generated in automotive fuel tanks from "mill scale" or corrosion processes may impair the operation of magnetic gauges and electronic solenoid valves.

Collection of gross amounts of solid residues can affect the proper operation of lock offs, mixers, pressure release valves, etc.

Solid residues could contain NORM (see note 3).



Material Safety Data Sheet

1 - Chemical Product and Company Identification

Manufacturer: WD-40 Company Address: 1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California, USA 92138 -0607 Telephone: Emergency only: 1-888-324-7596 (PROSAR) Information: 1-888-324-7596 Chemical Spills: 1-800-424-9300 (Chemtrec) 1-703-527-3887 (International Calls)	Chemical Name: Organic Mixture Trade Name: WD-40 Aerosol Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion MSDS Date Of Preparation: 3/11/10
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2 – Hazards Identification

Emergency Overview:

DANGER! Flammable aerosol. Contents under pressure. Harmful or fatal if swallowed. If swallowed, may be aspirated and cause lung damage. May cause eye irritation. Avoid eye contact. Use with adequate ventilation. Keep away from heat, sparks and all other sources of ignition.

Symptoms of Overexposure:

Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.

Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.

Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.

Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.

Chronic Effects: None expected.

Medical Conditions Aggravated by Exposure: Preexisting eye, skin and respiratory conditions may be aggravated by exposure.

Suspected Cancer Agent:

Yes No ☒ X

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent
Aliphatic Hydrocarbon	64742-47-8	45-50
Petroleum Base Oil	64742-58-1 64742-53-6 64742-56-9 64742-65-0	<25
LVP Aliphatic Hydrocarbon	64742-47-8	12-18
Carbon Dioxide	124-38-9	2-3
Surfactant	Proprietary	<2
Non-Hazardous Ingredients	Mixture	<10

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.

Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.

Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.
Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.

5 – Fire Fighting Measures

Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.

Special Fire Fighting Procedures: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

Unusual Fire and Explosion Hazards: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back.

6 – Accidental Release Measures

Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area. Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.

Storage: Store in a cool, well-ventilated area, away from incompatible materials. Do not store above 120 F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m ³ TWA, 10 mg/m ³ STEL ACGIH TLV 5 mg/m ³ TWA OSHA PEL
LVP Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Carbon Dioxide	5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH)
Surfactant	None Established
Non-Hazardous Ingredients	None Established

The Following Controls are Recommended for Normal Consumer Use of this Product

Engineering Controls: Use in a well-ventilated area.

Personal Protection:

Eye Protection: Avoid eye contact. Always spray away from your face.

Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.

Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended

Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.

Personal Protection:

Eye Protection: Safety goggles recommended where eye contact is possible.

Skin Protection: Wear chemical resistant gloves.

Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.

Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Boiling Point:	361 - 369 F (183 - 187°C)	Specific Gravity:	0.8 – 0.82 @ 60 F
Solubility in Water:	Insoluble	pH:	Not Applicable
Vapor Pressure:	95-115 PSI @ 70 F	Vapor Density:	Greater than 1
Percent Volatile:	70-75%	VOC:	412 grams/liter (49.5%)
Coefficient of Water/Oil Distribution:	Not Determined	Appearance/Odor	Light amber liquid/mild odor
Flash Point:	122 F (49°C) Tag Open Cup (concentrate)	Flammable Limits: (Solvent Portion)	LEL: 0.6% UEL: 8.0%
Pour Point:	-63 C (-81.4 F) ASTM D-97	Kinematic Viscosity:	2.79-2.96cSt @ 100 F

10 – Stability and Reactivity

Stability: Stable

Hazardous Polymerization: Will not occur.

Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.

Incompatibilities: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

The oral toxicity of this product is estimated to be greater than 5,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

None of the components of this product is listed as a carcinogen or suspected carcinogen or is considered a reproductive hazard.

12 – Ecological Information

No data is currently available.

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: Consumer Commodity, ORM-D

IMDG Shipping Description: Un1950, Aerosols, 2.1, LTD QTY

15 – Regulatory Information

U.S. Federal Regulations:

CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA TITLE III:

Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III

Section 313 Reporting requirements: None

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not contain chemicals regulated under California Proposition 65.

VOC Regulations: This product complies with the consumer product VOC limits of CARB, the US EPA and states adopting the OTC VOC rules.

Canadian Environmental Protection Act: One of the components is listed on the NDSL. All of the other ingredients are listed on the Canadian Domestic Substances List or exempt from notification.

Canadian WHMIS Classification: Class B-5 (Flammable Aerosol)

This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

16 – Other Information:

HMIS Hazard Rating:

Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)

SIGNATURE:  _____

TITLE: Director of Global Quality Assurance

REVISION DATE: March 2010

SUPERSEDES: August 2009