Appendix C
Waste Management Plan (WMP)

SLATER RIVER PROJECT – WASTE MANAGEMENT PLAN

AUGUST 2020

HUSKY OIL OPERATIONS LIMITED

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Husky

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1.0 Introduction

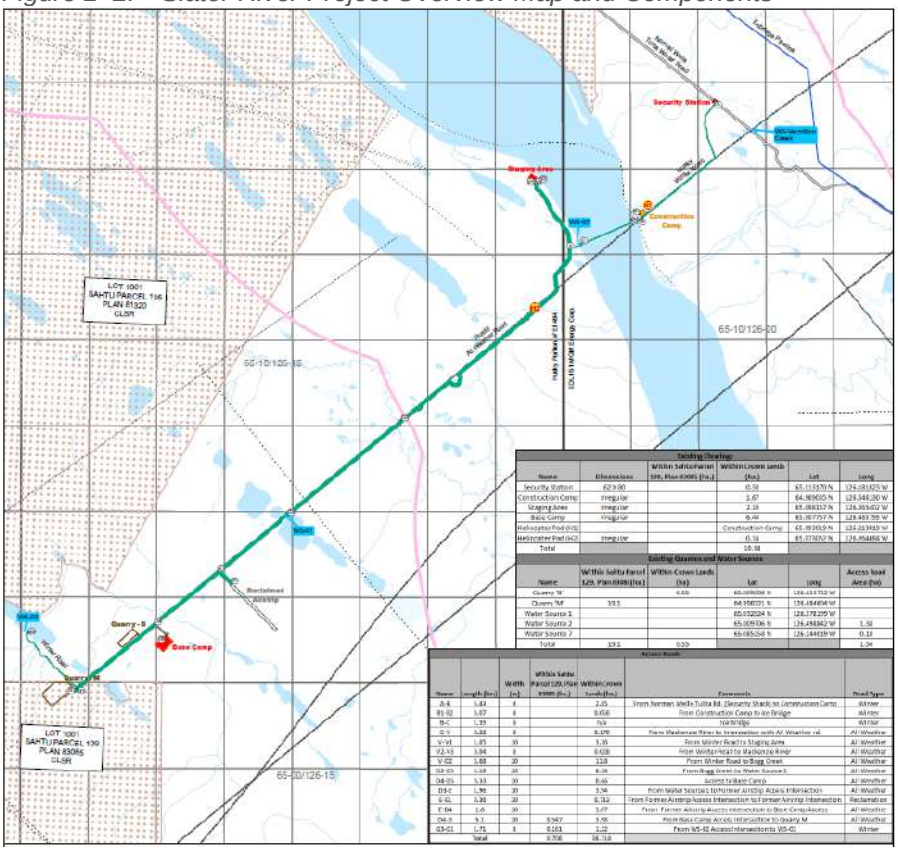
1.1 Slater River Project, Husky Oil Operations Limited (Husky)

Husky is proposing to consolidate the retained Slater River Project components requiring further reclamation or future care and maintenance into one new Land Use Permit and one new Water Licence. While the project is in a state of temporary suspension, reclaiming or maintaining project components will be scheduled over the next five years with a possibility of a two-year extension or a permit/licence renewal if there are no changes within project plans or regulatory requirements.

Husky's Slater River Project is located approximately 35 km southeast of the Town of Norman Wells in the Sahtu Region of the Northwest Territories. Access to the Slater River Project will be limited to barge vessels as well as fixed and rotary-winged aircraft in the spring, summer and fall. Ground access to site is only available during the winter months when the GNWT Winter Road is accessible. There is a limited amount of time to utilize the ice roads as the road is only operable early January to late March. Once spring break up occurs, there are no all-weather roads to enable access to the site, and barges or aircraft become the only means of transportation. A staging area was constructed on the west side of the Mackenzie River and will be used to offload the barge and store equipment. Figure 1-1 and 1-2 show the general location, and detailed map of the project area respectively.

Figure 1–1: Slater River Project General Location

Figure 1–2: Slater River Project Overview Map and Components



The Slater River Project will include the following project components listed in Table 1-1. **'Project components'**, or '**components**', refers to the access roads, bridges, culverts, storage pads, camp pad, quarries, and well sites related to the Project.

Table 1–1: Project component locations in Lat / Long DD NAD27, and Work Category

Component	Latitude	Longitude	Work Category
Winter Access Security Station	65.113455° N	126.181980° W	Care and Maintenance
Former Winter Construction Camp	65.091159° N	126.215201° W	Care and Maintenance
Winter Access Ice Roads (those included in the application)	n/a	n/a	Care and Maintenance
All Weather Access Road	n/a	n/a	Care and Maintenance
All Weather Staging Area	65.098052° N	126.265389° W	Care and Maintenance
All Weather Base Camp	65.006865° N	126.434409° W	Care and Maintenance
Quarry M	64.998421° N	126.485017° W	Care and Maintenance
Airstrip Access	65.014750° N	126.389600° W	Reclamation
Quarry B	65.009298° N	126.453732° W	Reclamation

The work categories as shown in Table 1-1 are defined below:

Reclamation: Return of the previously-used work areas to a natural state or equivalent land use. Implemented when the site and/or project components are no longer needed. Reclaimed areas are anticipated to be inspected over the next 3 to 5 years to ensure stability and vegetative growth is satisfactory.

Care and Maintenance: Keeping infrastructure/project components in an operable state for the life of the program. Requires ongoing monitoring and maintenance and can include installation or repair of rip-rap as well as re-grading or contouring of roads, pad areas, or quarries. Erosion or sediment control measures may be added to, repaired or replaced as required.

As Husky progresses Exploration Licence (EL) 494 to a Significant Discovery Licence (SDL), project components to support potential future development within the SDL will be maintained, while other project components no longer required will be reclaimed to a natural state.

While the potential for and dates of future drilling, completions, and other development activities is unknown at this time, Husky will continue with progressive reclamation, and care and maintenance activities for Slater River Site Wide Services project components to support the SDL. All proposed activities on the schedule will occur over the 5-year time limit prior to expiry of the new LUP and WL (with the possibility of 2-year extension or renewal).

Most activities regarding project component inspections and maintenance will be conducted during the summer operating period. Inspections and minor maintenance activities will take place after the spring thaw, with construction/repair activities commencing after June 8th, (See Table 1-1). Activities will include the following items:

- Inspection of the roadway and surrounding vegetation from the air and ground using helicopter, fixed wing or drone support and all-terrain vehicles when required;
- Erosion and sediment control installations will be inspected, and minor maintenance or replacement of controls conducted;
- Inspection of bridges and culverts to note any deficiencies;
- Conduct minor repairs, maintenance or fix any erosion or sedimentation issues; and
- Conduct and report surface water, wildlife and vegetation monitoring activities as required.

Table 1-1: Scheduled activities during a year conducting inspections and minor maintenance

Time Frame	Activities
June 9 - September 15	- Annual Inspection of project components and infrastructure
	- Project minor maintenance required immediately, straw wattle replacement, straw matting repairs; heli-access only
	- Targeted Water Sampling & Wildlife Program data recovery if required
October / November	- Reporting as outlined in terms and conditions of permit and licence

If inspections deem any major repairs, then summer operations may require heavy equipment. It is also anticipated that a maintenance cycle may be required every three to four years. Please see Table 1-2 for a schedule of an anticipated maintenance cycle or identified repair. The operations would be in line with barging operations between July and August. Activities through a major repair and/or maintenance cycle may include but are not limited to:

- Procuring barge operations and heavy equipment as described in the Equipment List located in the Environmental and Socioeconomic Effects Report (ESER), Table 6-1, and mobilize to the all weather staging area on the Mackenzie River;
- Load and mobilize aggregate materials stockpiled at Quarry M, the all weather staging area, or the camp pad to the areas requiring repairs or routine maintenance;
- Conduct repairs based on the inspection reports and project recommendations (e.g. construction or addition of rip-rap, check-dams, and surface water channeling where required; remove or replace culverts; clean out culvert sedimentation); and
- Complete a grading cycle of the road.

Table 1-2: Scheduled activities during a year conducting a maintenance cycle

Time Frame	Activities
June 9 to September 15	- Annual Inspection of project components and infrastructure
	- Mobilize equipment to the project via barge in June / July
	- Complete prescribed care and maintenance or reclamation program
	- Demobilize equipment and any waste to base or facility via barge / truck
	- Fall Inspections
	- Targeted Water Sampling & Wildlife Program data recovery if required
October / November	- Reporting as outlined in Conditions

If in the event there is any major damage to any project components (e.g. bridge failure, repairs that require frozen ground conditions) winter access may be required for repair. If the event occurred, it will be immediately reviewed with the SLWB and Land Inspectors to discuss the incident, possible solutions, and potential schedule for the mitigations to be put in place. The following activities may be required, but are not limited to:

- Construction of an iced pad, and set up of the security area and 3.5 km of winter access road to the east side of the Mackenzie River;
- Construction of 1,400 meter (m) ice bridge across the Mackenzie River to Husky's existing staging area on the west side. The ice bridge will be constructed to the minimum weight bearing capacity required for the heaviest piece of equipment required for repairs;
- Use of a winter airstrip on Water Source 2 for emergency situations and moving crews and equipment to and from the program area if required.

If conditions permit, the winter road construction and the ice crossing will be scheduled to start on December 1 of the year required. The ice bridge to the project on the west side of the Mackenzie River would be constructed through January, and the prescribed work based on the event, would take place until no later than mid to late March of the subsequent year. No new lands or access will be required. All work will occur within existing land disturbances. Water use will be less than previous programs and will be less than the volumes authorized in the current Water Licence.

If winter operations have not been completed by late-March and suitable conditions exist, a request may be submitted to GNWT Department of Lands to extend the program for permission to keep EL494 access open beyond the end of March closure. Husky recognizes that such an extension is weather-dependent day by day, and that operations might have to be suspended on short notice. If work cannot be completed by late March and conditions preclude an extension to the Program, further work may be required in subsequent winter season or be completed during summer operations.

The Slater River Project is owned and operated by:

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1.2 Effective Dates

The effective dates of the waste management plan will cover the five-year period of the new water licence and land use permit, once approved. The plan will be reviewed and updated if required in the future for potential extensions or renewal.

1.3 Environmental Policy Relating to Waste Management

Husky is committed to operational integrity. Operational integrity at Husky means conducting all activities safely and reliably so that the public is protected, the health and well-being of employees is safeguarded, contractors and customers are safe, impact to the environment is minimized, and physical assets (such as facilities and equipment) are protected from damage or loss.

The Company conducts its business to maximize positive impacts on current and future generations in accordance with Husky's values.

This relates to waste management as Husky utilized the basic principles of waste management, source reduction, reuse, recycle/recover, treatment and disposal. Operations are conducted within the accepted environmental standards of the oil and gas industry. These methods are important to the oil and gas industry in reducing the environmental footprint of operations.

Source reduction is the elimination or decrease of the volume or toxicity of waste by adopting practical methods such as using alternative materials or processes. This can be achieved by material elimination, inventory control and management, material substitution, process modification and improved housekeeping, maintenance and training.

Reuse is achieved by using a product more than once for the same application or for different purposes. Reusing any waste materials (e.g. rough lumber) is an industry expectation and can reduce the amount of waste generated.

Recycling of products that typically have one use is an excellent method of reducing the volume of waste generated at a worksite. Sorting the products so that they can be managed in bulk eliminates the need for additional handling and allows for different products to be managed by efficient recycling processes.

Waste treatment is used to reduce the volume, mass and/or toxicity of the material prior to disposal due to contaminants contained within the waste. There are several treatment options including thermal, chemical, biological and physical processing which may be used separately or combined to be the most effective and efficient.

Disposal of waste is the final option for waste management. When disposing of waste, the type of waste, volume, location and final containment must be considered. The waste disposal options available to the oil and gas industry include deep well injection, landfills, and on-site burial or land farming. The physical and chemical characteristics as well as the regulatory requirements and liability associated with disposal may limit which options are available for waste disposal.

1.4 Purpose and Scope of the Plan

This Waste Management Plan (WMP) dealing with ongoing reclamation, and future care and maintenance, will detail how waste generated on the project can be safely and effectively managed. Project waste streams will be significantly reduced for the operations over the terms of the new water licence and land use permit. The goal will be to continue to manage waste safely through temporary storage onsite, until waste can either be treated onsite or shipped offsite and received at an approved waste management facility for end disposal.

As this project is ongoing, but in a state of temporary suspension, waste streams will be minimized over the usual 5-year period of water licences and land use permits. Only during a programmed maintenance cycle, waste streams may increase.

This Waste Management Plan will cover:

- Waste types including characterization of waste and waste management methods;
- Incineration management and ash disposal;
- Small amounts of sewage;
- Hazardous waste;
- Non-hazardous and other waste streams;
- Contractor services regarding onsite waste management; and
- Project Emissions information.

This plan will be submitted as an appendix to the Environmental and Socioeconomic Effects Report through the application process to the Sahtu Land and Water Board. Husky shall maintain a copy of this plan on site during operations to satisfy Government of the Northwest Territories Land Department or Water Licence inspectors.

Based on this waste management plan the following legislation and guidance documents are relevant to the Project and Plan:

- Canadian Environmental Protection Act (CEPA). S.C. 1999, c.33
- Oil and Gas Drilling and Production Regulations. (OROGO). 2014.
- Environmental Protection Act. R.S.N.W.T. 1988, c.E-7
- Interprovincial Movement of Hazardous Waste Regulations. SOR/2002-301
- Waters Act. (GNWT) 2016
- Waters Regulations. (GNWT) 2015
- Technical Document for Batch Waste Incineration, (ECCC) January 2010
- Transportation of Dangerous Goods Act (TDGA). S.C. 1992, c.34

- Transportation of Dangerous Goods Regulations. SOR/2020-23
- American Public Health Association (APHA), American Water Works Association, Water Environment Federation. 2012. Standard Methods for the Examination of Water and Waste Water, 22nd Edition. Eds. E. W. Rice, R. B. Baird, A. D. Eaton, L. S. Clesceri.
- Canadian Association of Petroleum Producers (CAPP). 2012. Waste Profile Sheets 2012
- Ecosystem Classification Group. 2007 (rev. 2009). Ecological Regions of the Northwest Territories – Taiga Plain. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 173 pp. + folded insert map.
- Government of the Northwest Territories (GNWT). 1998 (rev. Oct 2017). Guideline for the General Management of Hazardous Waste in the NWT. Department of Environment and Natural Resources.
- Alberta Energy Regulator. December 2001 (AER). 2013. Directive 55: Storage Requirements for the Upstream Petroleum Industry.

1.5 Project Description Details and Relevant Land Use Permits and Water Licences

The specific project description details are discussed in the Introduction section, 1.1. Table 1-3 outlines the relevant licences utilized in the previous abandonment program and reclamation work completed and used to complete this application.

Table 1-3: Relevant Husky Land Use Permits / Water Licences to support Waste Management

Permit or Licence	Permitted or Licensed Activity
Water Licence S13L1-006	Licences water use, surveillance network program and waste management parameters for Slater River Site Wide Services
Land Use Permit S13X-003	Permits all weather access, winter access, camp operations, logistics, construction and use of staging area off the Mackenzie River
Water Licence S13L1-005	Permits water use, well activities, surveillance network program and waste management
Land Use Permit S13A-002	Permits the well activities relevant to the surface locations
S12X-006	Permits groundwater exploration program

1.6 Proposed Locations for Waste Management Activities

All waste management activities will take place on the locations listed in Table 1-4. Please refer to the Environmental and Socioeconomic Effect Report for general area and current project component maps.

Table 1-4: Locations where waste management activities will take place

Component	Latitude	Longitude	Description of Activities
Winter Access Security Station	65.113455° N	126.181980° W	Potential sewage treatment and discharge, and temporary waste storage if winter activities are required
All Weather Staging Area	65.098052° N	126.265389° W	Potential pile burn of waste rough lumber (with associated burn permit), and waste storage
All Weather Base Camp	65.006865° N	126.434409° W	Potential sewage treatment and discharge, temporary waste storage, and potential pile burn of waste rough lumber (with associated burn permit).

1.7 Site Descriptions

Please refer to the ESER for detailed information regarding the Slater River Project area baseline and site characteristics.

The Winter Access Security Station described in the ESER, will only be utilized in winter conditions on an ice pad of approximately 15 cm or more. It is unlikely that the site will be used unless a large-scale project due to emergency circumstance arose and required winter work. However, the site may require access within the next few years to roll out woody debris bermed along the edge across site to help promote weathering and breakdown of the materials. This will help foster vegetative growth across the site. Sewage treatment and disposal may be required on this site if active.

The all weather staging area is a constructed gravel pad, and the site characteristics can be referenced in the ESER. Any waste destined for third party regulated disposal facilities located south of the project in NT or AB will be temporarily stored on this location prior to barging on the Mackenzie River to Fort Simpson then moved by the appropriate truck and trailer. There is potential for rough lumber from damaged matting to be burned on this location after acquisition of the appropriate burn permit from Environment and Natural Resources personnel.

The all weather base camp is a constructed gravel pad, with the site characteristics referenced in the ESER. Any waste consolidation, storage, treatment and disposal will be completed on this site if required. It is likely that waste generated will be kept to a minimum during inspection and minor maintenance years, with increased waste management activity during a full maintenance cycle. Currently only one full maintenance cycle is planned during the next 5 years, and only if warranted through noted deficiencies identified through inspections.

2.0 Waste Types

2.1 Waste Characterization

Waste characterization is used in assessing the appropriate handling, treatment, transportation and disposal of the waste. Characterization is the assessment of the physical, chemical and toxicological properties of the waste product. These properties are used to determine the dangers relating to handling, storage, and transportation of the waste on public roads, as well as to determine the environmental consequences of the waste so that an appropriate disposal option can be determined. This also allows the determination of a hazardous or non-hazardous waste as well as dangerous oilfield waste classification as required in Alberta. Waste transportation and disposal is regulated by the NT or Environment Canada and the receiving jurisdiction, in this case Alberta.

Regulated wastes include any waste material which is specifically regulated as hazardous (in CEPA or through the various guidelines issued by EPS of GNWT-ENR), and dangerous for transport (in CEPA and TDGA).

The following are properties that wastes may have that require additional personal protective equipment, and safe work procedures when handling, storing and disposing:

2.1.1 Ignitability

This will apply to liquids, solids or gases; however, the most common are liquids or solutions which have a flash point of 23°C or below. Other materials included in this class are oxidizers which readily yield oxygen to support the combustion of organic materials, waste which can spontaneously combust, and flammable compressed gases. Examples of ignitable wastes include acetone, hexane, methanol, and isopropanol.

2.1.2 Corrosives

This classification applies to liquids only. A waste is corrosive if its pH is equal to or less than 2, or equal to or greater than 10. Liquids which corrode steel at rates greater than 6.35 mm/year are also considered corrosive. Examples of corrosive waste include mineral acids, sodium, and potassium hydroxide.

2.1.3 Reactivity

This classification encompasses two types of hazards; physical and health. Wastes with reactive physical characteristics are those with the potential of reacting violently, presenting fire hazards, and/or capable of explosion at normal temperatures and pressures. Wastes with reactive health hazards are those which will release toxic or irritating vapors or fumes when mixed with water or acids. Examples are reactive laboratory wastes, such as sulphide solutions and water-reactive metals.

2.1.4 Toxicity

This classification includes those substances which can cause acute, chronic or adverse effects in humans and/or the environment. Examples of toxic wastes include biocides, carcinogens and heavy metals such as lead, chromium and arsenic.

Generally, a waste is considered non-hazardous if it does not possess any of the above-mentioned characteristics; however, caution must be used when following these guidelines. Although some materials do not fall into these hazard classes, they still may pose a threat to the environment or humans and should be handled accordingly.

If doubt exists whether a material is a “hazardous waste” or a “dangerous good”, Husky field personnel will consult with their supervisor or the onsite environmental representative.

2.2 Waste Management Methods

2.2.1 On-site Methods

Physical Methods: Surface water meeting applicable criteria can be pumped to natural areas to recharge the natural water cycle. Detailed information and requirements related to this strategy are included hereinafter.

Incineration: Incineration is another means of reducing the mass and volume of waste, including paper products, domestic rubbish, and kitchen wastes. It is also a method used to prevent wildlife scavenging. It is important to segregate the plastics and heavy metals from normal waste to meet the dioxin, furan and mercury standards. A two-stage forced air, diesel fired incinerator with properly trained personnel will be utilized. Resulting ash is packaged and transported to an approved waste facility.

2.2.2 Off-Site Disposal

Landfill / Waste Treatment Facility Disposal: Landfills and waste treatment facilities are regulated and monitored facilities designed to accommodate burial of solid waste, or treatment and downhole disposal of waste fluids. A key consideration in the operation these sites is the need to ensure long-term containment. Husky will be utilizing these facilities designed to receive these waste streams.

Waste Transfer Facility: Waste transfer facilities are utilized by industry to accommodate smaller volumes and typically containerized waste. Hazardous or non-hazardous waste is received then consolidated with like wastes; this bulked material is then transported to end or final receiving facilities. The final receiving facilities are typically engineered to facilitate specific waste streams based on characterization and classification. These facilities are only utilized for waste transfer; as such they are engineered and regulated in a fashion that prevents environmental impact. Transfer facilities are licensed to receive all classes of waste with the exception of Class 1 Explosives and Class 7 Radioactive.

Husky will only transport and dispose of waste utilizing approved carriers and receivers. This guarantees the companies are registered with the provincial authorities and hold all applicable licenses and permits to handle the waste they will transport or receive. It will also ensure cradle to grave management of liabilities associated with generating and transporting hazardous or

industrial wastes. Once the waste stream is received at the applicable, approved facility, the responsibility and liability is then transferred to the receiver.

Husky will be selecting approved disposal facilities based on liability as well as, general logistics and economics. This means Husky will select the closest approved facility that is in the general area the trucks are dispatched from. This will not only reduce the cost of transporting the waste but will reduce the liabilities associated with the trucks being on the road for great distances.

2.2.3 Waste Generation Table

A detailed table of potential waste streams is attached as Appendix A and includes a summary of potential wastes to be generated during the project. This table also includes the description of generation, handling and estimated volumes, if known.

3.0 Waste Management at Slater River – Reclamation and Maintenance

Various wastes are generated during the day to day activities associated with reclamation and maintenance. It is essential that wastes are handled, stored and managed in a safe, compliant and environmentally responsible manner. Remote sites often face logistical challenges in which proper plans must be in place prior to project commencement. This section of the plan will go into specific detail on the type of waste management options Husky will utilize for their reclamation and maintenance operations, as well as outline the types of chemicals and fuels on site.

Per the project description in Section 1.1, most of the work conducted over the next 5 years will utilize a small crew of personnel between three (3) and up to six (6) people. If deemed necessary through site inspections, then a maintenance cycle utilizing heavy equipment will be planned, and crews of up to 25 personnel may be required. This will be reflected throughout this plan for Slater River.

3.1 Potential Chemicals / Fuels on Site

Based on the reclamation and maintenance plans for Slater River, minimal amounts of chemicals and fuel will be stored on site and are listed in Table 3-1. Safety Data Sheets (SDS) are listed in Appendix B. Chemicals and fuels will be stored at the all weather base camp, with fuels only being stored during active operations.

Table 3-1: Chemical list and fuel storage

Chemical and Fuel on site	Unit Size	Number of Units	Max Volume/Weight
Unleaded Gasoline (Jerrycans)	25 L	5	125 L
Diesel Fuel (Light Distillate – 1 tanker truck)	Approximately 16,000 L	1	16,000 L
Jet A Fuel	205 L	6	1,230 L
Diesel Exhaust Fluid	4 L Jug	150	600 L
Lithium (AA) Batteries	12 pack	42	504 batteries (if required)

Unleaded gasoline will be onsite in Jerrycans during operations where all-terrain vehicles, trash pumps, chainsaws, and hand-held augers may be required. Diesel fuel will only be onsite during maintenance cycles or when heavy equipment is operating. The fuel will be stored within a fuel tanker truck which will be mobile and able to fill up equipment where required. Jet A Fuel may also be stored in 205 L drums at the all weather base camp during any active air support operations.

Drip trays and personnel supervision of fueling activities will be mandatory, to minimize risk of potential spills. If a spill does occur, the source will immediately be shut in, and cleanup will commence immediately. The spill contingency plan is located in the Husky Oil Northwest Territories Emergency Response Plan (Appendix D), and the appropriate regulatory and internal notifications completed (*Appendix A*, *Advisian, Worley Group, Environmental and Socioeconomic Effects Report, Husky Slater River Project 2020-2025, Husky Oil Operations Limited* as part of the submission).

3.2 Domestic Waste and Incineration

The inspection and minor repair work to be completed over the next 5-year cycle will require a crew of 3 – 6 personnel, and domestic wastes will be minimal. As there will be no camp facilities on the Slater River Project in place for these operations, hotels and open camps will be utilized within the nearest communities. Personnel will be expected to pack in / pack out any domestic wastes utilizing the facilities procured for lodging. Any plastic wrapping for erosion control supplies will be stored in mega bags on site and stored within a sea can until a maintenance cycle, where the plastics can be sent to the appropriate disposal facilities.

If required, the reclamation and maintenance cycle will utilize a crew of up to 25 personnel on location during Summer Operations. Camp Operations on the Slater River Project will not be utilized, and personnel will stay in hotels and open camps within the surrounding communities. In this case, the potential to use an incinerator for domestic wastes and personal sewage will be increased, as storage of domestic wastes on site may attract wildlife and scavenging on site. As the waste will mainly be organics, rough lumber and paper products, waste will be incinerated during operations daily, while personnel remain on site. Remaining ash will be deposited in an ash bin with a latched door.

Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Incineration is an efficient means of reducing the mass and volume of waste, including paper products and domestic rubbish.

During the maintenance cycle, the Slater River Project may utilize one forced-air fuel fired incinerator to incinerate all domestic combustible garbage and debris generated by the project. A CY-2050-FA incinerator located at the all weather base camp pad, will be used to manage burnable waste streams generated. The unit is forced air and runs on diesel. As waste amounts are below 26 tonnes per year, the incinerator unit is appropriate using the *Technical Document for Batch Waste Incineration, January 2010*, *Environment and Climate Change Canada.*

Figure 3-1: CY-2050-FA Incinerator Model

Husky will follow a six-step process for batch waste incineration:

Step 1 – Understand Your Waste Stream
Step 2 – Select the Appropriate Incinerator (or Evaluate the Existing System)
Step 3 – Properly Equip and Install the Incinerator
Step 4 – Operate the Incinerator for Optimum Combustion
Step 5 – Safely Handle and Dispose of Incinerator Residues
Step 6 – Maintain Records and Report

Understanding waste stream composition is important as it drives opportunities for waste management planning including control of incineration on-site and movement of wastes off-site. Once operational, incinerator logs and operational checklists will be used to monitor types and quantities of waste generated. Using information from former operations, and various industry knowledge we can predict and plan waste management requirements. Tables shown below illustrate anticipated program waste composition and annual volumes generated.

Table 3-2: Estimated composition of Slater River Incinerator waste streams

Waste Type	Estimated Percentage of Waste by Weight	Management Method
Food Waste	40%	On-site Incineration
Paper/Cardboard/Personal Sewage	20%	On-site Incineration
Plastic	10%	Off-site disposal
Inorganic	5%	Off-site recycle
Wood/Debris - untreated	25%	On-site Incineration

It is estimated that each individual will generate 2.2 kilograms of domestic waste per day. This quantity will include personal sewage waste, as there will be no remote camp operations generating waste on site. Section 3.3 will discuss sewage waste in detail, which will be added to the incinerator waste stream. This information can be used to determine the total monthly volume based on number of individuals on-site. Of this total volume of waste generated approximately 85% of waste will be incinerated and 15% transported offsite for disposal or

recycling. Incineration on site will reduce the volume further, by approximately 85% resulting in 15% of residual ash. Waste ash will be temporarily stored for transportation and disposal off-site at an approved landfill.

Over the maintenance cycle, operations will occur for approximately 1 month during the summer. As operations will remain minimal going forward, these numbers can be used to gauge any ongoing operations.

Table 3-3: Estimated monthly domestic waste generation and incinerator ash

Number of Personnel	Domestic Waste	On-site Incineration	Off-site Management	Estimated Ash
15	990 kgs	841 kgs	148.5 kgs	126 kgs
25	1,650 kgs	1,402 kgs	247.5 kgs	210 kgs

Husky will continue to use proper training, oversight, and mitigation methods to minimize all hazards and associated risks while operating the incinerator. Waste and incinerator ash will be tracked and reported as required, with the ash going to the appropriate landfill facility outside of the NT for final disposal.

For a detailed review of waste collection, examples of hazards/risks, mitigation and safety requirements for incinerator operations, please reference Husky Land Use Permit *S13X-003, Waste Management Plan Update 2018*, Section 3.a.iv through to Section 3.a.xii. The link can be found at:
http://registry.mvlwb.ca/Documents/S13X-003/S13X-003%20-%20Waste%20Managment%20Plan%20Update%202018%20for%20Slater%20River%20Abandonment%20Program%20-%20Dec%206_18.pdf

3.3 Sewage Waste

With only inspection and minor repair work to be completed over the next 5-year cycle, sewage wastes will be negligible. As there will be no camp facilities on the Slater River Project in place for these operations, hotels and open camps will be utilized within the nearest communities. With the small crew of personnel on the project, they will utilize facilities provided at the open camps or hotels.

During a planned maintenance cycle, personnel will continue to utilize hotels and open camps within the nearest communities. As these facilities are already a part of the communities they will provide the required sewage management and disposal required.

On the remote Slater River Project site using the larger crew size, portable toilets will be available for the reclamation and maintenance cycle. Compostable bags will be available for each person to dispose of their personal waste as required and the waste will be added to the domestic waste stream and incinerated daily. Hand sanitization stations and daily cleaning of the portable toilets will be provided.

If the project warrants increased time or a winter program, any well site trailers or security shacks utilized will be plumbed into a waste water treatment plant (WWTP). The WWTP consists of a model T-25 attached growth biological reactor (AGBR) system specifically designed for remote camp applications. This mobile sewage treatment system utilizes fixed activated sludge treatment (FAST) and UV light to provide a complete and versatile sewage

treatment system capable of extracting 85-90% of the biodegradable solids. An operator will set up the T-25 AGBR treatment unit and system and will oversee the unit operations.

Three main waste streams are expected because of the domestic waste water operations. These streams are listed below as follows:

- Raw sewage;
- Treated waste water effluent after treatment in the WWTP; and
- Residual sludge generated during treatment in the WWTP.

Raw sewage generated at the well site trailers will be pumped through lift stations attached to the well site trailers and into the T-25 AGBR treatment unit.

After waste water effluent is treated in the plant, samples are taken, and various parameters are verified to ensure that the effluent meets the criteria to discharge the waste to the environment.

All required analysis will be conducted in accordance to methods described in the current edition of "Standard Methods for the Examination of Water and Waste Water," or by such other methods approved by the analyst. Samples will be taken at regular intervals and will be determined by the length of the potential work required.

Table 3-4: Treated effluent discharge parameters

Parameter	**Maximum Concentration**
Suspended Solids	100 mg/L
Oil and Grease	5 mg/L and no visible sheen
BOD_5	100 mg/L
Fecal Coliforms (counts/100 ml)	< 1 x 10^6 CFU/100 ml
pH	6-9

A series of discharge hoses will have small holes drilled throughout to slowly disperse the effluent across the chosen environment to the designated field off site in the surrounding vegetation.

All analyses will be conducted by a third-party CALA-accredited laboratory in accordance to methods described in the current edition of Standard Methods for the Examination of Water and Waste Water (APHA *et al* 2012) or by such other methods approved by the analyst. Samples will be collected and analysed for residual carbonaceous biological oxygen demand (CBOD), total suspended solids (TSS), oil and grease and fecal coliforms as warranted by the project timing (approximately every two weeks on seasonal projects). Discharge to the surrounding environment will commence once effluent meets the required parameters. A series of discharge hoses will have small holes drilled throughout to promote slow dispersion of the effluent across the appropriate surrounding environment (effluent field).

Solid waste (sludge) will be separated from liquid waste, stored in secure, covered containers, which are then transported by vacuum truck via barge and/or road transportation via the GNWT winter road, to designated receiving facilities. Receiving facilities of sewage sludge are confirmed as approved receivers through a 3rd party waste audit protocol considering jurisdictional approvals and operating procedures and capacity.

It is anticipated that 30 - 40 cubic meters of effluent would be produced and discharged to the environment per month if maintenance cycle operations warrant the equipment. Approximately 2.5 to 15 cubic meters of solids and clean out fluid will be produced and hauled to an approved sewage disposal facility in Alberta for every month that the treatment unit would be utilized.

3.4 Hazardous Waste

Waste which may contain hazardous properties may be generated during the day to day operations of project. While the operations are minimal, there are still potential risks associated with potentially hazardous wastes onsite. These wastes require special handling and disposal to ensure they do not negatively affect human health or the environment. The NT Guideline for the General Management of Hazardous Wastes define "hazardous wastes" as: *"A contaminant which is a dangerous good that is no longer used for its original purpose and is intended for recycling, treatment, disposal or storage. A hazardous waste does not include a contaminant that is:"*

- Household in origin
- Included in class 1, Explosives or class 7, Radioactive materials of Transportation of Dangerous Goods Regulations (Canada)
- Exempted as a small quantity
- An empty container
- Intended for disposal in a sewage system or by land filling that meets the applicable standards set out in schedules I, III or IV of the Nunavut Environment Guideline for Industrial Waste Discharges in the NWT."

A copy of the Guideline for the General Management of Hazardous Waste in the Northwest Territories will be onsite for reference, or will be available on the GNWT Environment and Natural Resources website or by using the following link:

https://www.enr.gov.nt.ca/sites/enr/files/resources/128-hazardous_waste-interactive_web_0.pdf

3.4.1 Hazardous Waste at the Slater River Project

An example of Hazardous waste that may be generated onsite includes used lithium batteries and contaminated or old petroleum hydrocarbons. Waste streams will be transported and disposed of using the appropriate territorial regulations as noted in the decision flow chart of the above noted link. During larger scaled maintenance operations, segregated bins with appropriate drums will be available for temporary storage prior to transport and disposal.

All contaminated material will be removed from the permitted area in a timely manner. Very small volumes of hazardous waste during operations for reclamation and maintenance are anticipated. All hazardous waste generated during this phase of the Slater River Project will be stored, transported and disposed of in a safe manner to minimize possible risk to the site workforce, the general public and the environment.

All hazardous waste generated at the project must be classified, collected in appropriately labeled containers, segregated into compatible groups, securely stored, transported and disposed of in an appropriate and approved manner. Documentation related to the management

of hazardous wastes will be accurately completed and submitted to required regulatory bodies with copy(ies) retained onsite for a period no less than 2 years.

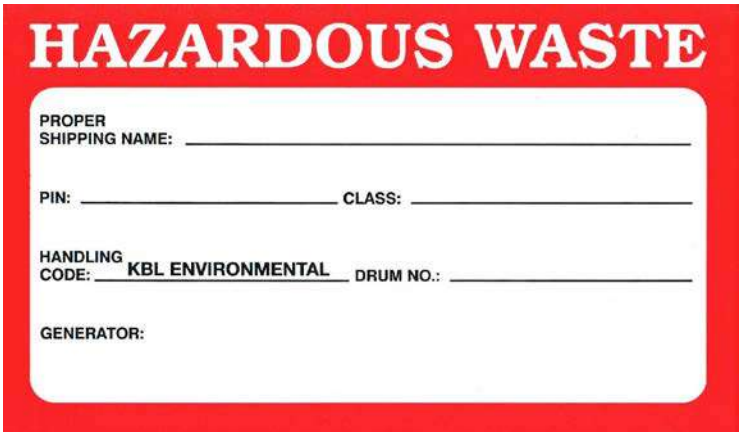
Husky has received a hazardous waste generator registration number **NTG000277** from the Northwest Territories Environmental Protection Division of Environment and Natural Resources.

3.4.2 Hazardous Waste Handling

Safe handling precautions and product specific information is found in Safety Data Sheets (SDS) which must be located on site and accessible to all workers. The following points will be considered for handling and storage of waste streams:

- Transportation means will be selected according to HSE and TDG requirements;
- Carriers of waste will be provided with instructions on how to handle emergency situations;
- All persons interacting with hazardous wastes will be required to wear the appropriate Personal Protective Equipment specified in SDS;
- Regular inspections will be performed and recorded;
- Containers are placed so that each container can be inspected for signs of leaks or deterioration;
- All hazardous wastes are stored in a location that provides the maximum amount of safety for site personnel and protection of the environment;
- Incompatible chemical wastes are not packaged or stored together based on the WHMIS and/or the SDS for each chemical;
- All hazardous wastes are stored on-site for the shortest practical length of time and in a manner that prevents release to the environment;
- Appropriately sized containers are used for collecting and storing the waste;
- In the case of 4 or 10 L plastic containers, 20 L pails, and 205 L drums, the container is also the “package” and shall have the appropriate label affixed to it;
- Efforts are made not to contaminate the outside of the container during filling. Containers and packages with visible signs of external contamination will not be used in the storage or transport of hazardous wastes;
- Personnel ensure that all container and package lids are secured tightly;
- Personnel ensure that all approved containers and packages are structurally capable of withstanding the aggregate weight of all containers within the package;
- Leaking or deteriorated containers are removed as soon as practical and their contents transferred to a sound container;
- The storage facility is equipped with emergency response equipment appropriate for the type and volume of materials stored within (i.e. spill kit, appropriate type of fire extinguisher, etc.); and
- All waste containers and packages are properly labeled according to the appropriate WHMIS, SDS and/or federal Transportation of Dangerous Goods Regulations.

Figure 3-2: Example of hazardous waste label required for storage and transport



3.5 Other Waste Streams (Non-Hazardous)

Non-hazardous solid waste not incinerated will be stored on site in the appropriate bin and transported off-site to the appropriate disposal or recycling facility. Examples of waste are as follows:

- **Used Lube and Engine Oils:** Vendors involved in any heavy equipment or vehicle work at Slater River will be asked to complete any lube oil or engine oil changes at their home base prior to mobilization to site. If at any time, a change must be completed at site, appropriate SDS will accompany oils to site. It is unknown of the types of engine and lube oils that a vendor could potentially use at this time. The oils will be stored and transferred off site for disposal via segregated bin with drums.

- **Recyclables:** will be packaged appropriately in multi-sectional bins and shipped to the appropriate recycling facilities, dependant on facility availability.

- **Wooden debris:** will be recovered for reuse or burned in a suitable incinerator (described above), burned in pile (with burn permit acquired from ENR), or transported for disposal at an approved landfill.

- **Scrap Metal:** Most scrap metal has been removed from site. If scrap metal is still on site it will be consolidated and shipped to a recycler via megabag or bin depending on size.

- **Surface Water:** Water in onsite pits or on the quarries may require pump-off from time to time. This waste stream may be generated from the collection of surface run-on/run-off waters from rain or snow melt. Water will be managed per *Alberta Energy Regulator Directive 55: Storage Requirements for the Upstream Petroleum Industry, December 2001, Section 11, Criteria for the Surface Discharge of Collected Surface Run-on/ Runoff Waters*. Collected waters (in berms or dykes) must be tested and will meet the following criteria prior to being released in a controlled fashion to adjacent lands:

    - Chloride content 500 mg/L maximum;
    - pH 6.0 to 9.0;

- No visible hydrocarbon sheens;
- No other chemical contamination;
- Land owner or occupant consent if required;
- Water not allowed to flow directly into any water course; and
- Each release shall be recorded, including the pre-release test data and estimated volume of water released.

If the water has been contaminated or does not meet the above criteria, the water will not be released to the environment. Impacted waters will be sent to an approved treatment or disposal facility depending on the characteristics of the contamination. This directive can be referenced at the following link: https://www.aer.ca/documents/directives/Directive055.pdf

3.6 Off-Site Waste Management

Off-site waste management infrastructure includes registered, approved third-party carriers and receivers. Husky selects and utilizes the approved disposal facilities based on liability, logistics and economics. Third party disposal facilities are selected based on the approved facility that is in the general area that trucks are dispatched to reduce the cost of transportation and the liabilities associated with trucking distances.

3.6.1 Waste Receivers

Table 3-5 lists examples of the waste receivers utilized on the Slater River Project for hazardous wastes.

Table 3-5: Examples of third party waste facilities used for waste disposal or management

Facility Type	Company	Location	LSD(s)	Approval #	Waste
Oilfield Waste Processing Facility / Class II Landfill	Tervita	Rainbow Lake, AB	16-32-110-05W6 & 05-111-05W6	WM057 / 193262-01-02	Fluid & Solid (haz and non-haz) / Solids (non-haz)
Waste Transfer Facility	KBL	Yellowknife, NT	17 Cameron Road	NTG000123	haz / non-haz

3.6.2 Waste Transportation

Storage containers will be utilized on-site for waste packaging prior to shipment off-site by marine and road transport when required. Due to the remote location, Husky faces logistical challenges when shipping waste off-site for disposal at an approved facility. Husky has the option of shipping waste during the short barge season utilizing the Mackenzie River or preparing waste for shipment via truck on the GNWT Winter Road.

All hazardous waste transported off-site for recycling or disposal will be packaged, documented via appropriate movement document and transported according to the specifications provided in the Northwest Territories Guideline for General Management of Hazardous Waste in the NWT,

the federal Transportation of Dangerous Goods Regulations (TDG), the International Air Transportation Association (IATA), the International Maritime Dangerous Goods (IMDG), and the Interprovincial Movement of Hazardous Wastes Regulations to meet the requirements.

3.7 Tracking and Recording of Waste

Tracking and recording waste types and volumes is a necessary and important function in an efficiently running waste management system. Adequate records on waste details such as dates, quantities, waste in storage, being transported, treated and disposed of, will be kept for a period of at least two years. Husky maintains an accurate record of all hazardous waste materials generated on-site and all materials transported off-site. That record, at a minimum, includes:

- A list of the materials being stored/transported;
- The volume of each material being stored/transported;
- The type of container used to store the material;
- The location of the stored material; and
- SDS sheets for all waste handled by personnel to ensure safe handling.

All waste records must be tracked from cradle to grave by the generator and kept on record for a period of two (2) years. The waste generator of the waste (supervisor or his/her delegate associated with the activity – construction) will be responsible for completing part A of the Federal Movement Document (FMD) This individual will be required to hold a valid certificate in TDG.

Hazardous Waste: The Guideline for the General Management of Hazardous Waste in the NWT requires that a completed movement document accompany shipments of hazardous waste. In addition, hazardous waste regulations in other provinces and by Environment and Climate Change Canada's Interprovincial Movement of Hazardous Waste Regulations must be followed.

A Movement Document supplied by the Department of Environment and Natural Resources qualifies as a hazardous waste manifest form and is recognized by other provincial agencies. All parties involved in the disposal of hazardous wastes, the generator, the carrier and the receiver must be registered and provided with the appropriate registration number. In the NT, these numbers are provided by the ENR.

Non-Hazardous Waste: Movement documents or Husky generated internal movement documents will be used to track all non-hazardous waste.

3.8 Waste Management Personnel

Husky has dedicated environmental consultant personnel both in the field and in the Calgary office during project operations. Environmental contractor selection is conducted through the company's internal procurement process to ensure that the contractor is qualified according to Husky and regulatory requirements. The contractor will be responsible for the following:

- Adhering to contract provisions pertaining to health, safety and environmental protection;
- Confirming equipment provided for the storage and transport of wastes such as waste bins or containers and trucks are in good working order prior to being accepted by Husky;

- Confirming that waste materials are packaged and labeled appropriately, shipping notification and documentation is completed in accordance with approved procedures and that documentation rests with Husky at the end of the program; and
- Ensuring waste consignments reach the specified final disposal site and are disposed of at an approved facility.

Environmental services will include a senior environmental advisor who will provide direction and guidance to the program through the field environmental advisor. The field environmental advisor will possess the following skills and responsibilities:

- Working knowledge of relevant waste regulations for the NT, BC and Alberta;
- Characterise wastes prior to/following generation;
- Influence in managing water volumes used throughout the operation;
- Ensure that cross-contamination of waste does not occur on the program site or at any other related Husky operated property;
- Coordinate the handling and disposition of wastes;
- Track waste material and volumes being generated, transported and manifested;
- Monitor the performance of waste-containing equipment supplied by outside contractors and posses the authority to reject faulty equipment; and
  Provide support to the selected contractor and Husky's logistics personnel as needed
- Workplace Hazardous Material Information System (WHMIS); and
- Transportation of Dangerous Goods (TDG).

Accordingly, the TDG Regulations Section 6.1 (2017) state that:

(1) A person who handles, offers for transport or transports dangerous goods must
- **(a)** be adequately trained and hold a training certificate in accordance with this Part; or
- **(b)** perform those activities in the presence and under the direct supervision of a person who is adequately trained and who holds a training certificate in accordance with this Part.

(2) An employer must not direct or allow an employee to handle, offer for transport or transport dangerous goods unless the employee
- **(a)** is adequately trained and holds a training certificate in accordance with this Part; or
- **(b)** performs those activities in the presence and under the direct supervision of a person who is adequately trained and who holds a training certificate in accordance with this Part.

4.0 Summary of Waste Management Planning

Each class of waste generated in Husky's operation is identified in the attached Waste Management Table in Appendix A, which contains the following:

- Waste Stream
- Description
- Handling Method
- Disposal Method (Handling Code)
- AB Code
- Shipping Name

- PIN
- Class
- PG
- Comments

The Waste Management table will be available to personnel during operations at site to assist field staff with determining appropriate waste management. The On-Site Environmental Supervisor or Work Site Lead is responsible, in conjunction with Husky corporate personnel, to ensure that all wastes are managed and tracked in accordance with this plan.

Appendix A-1 – Waste Management Summary Table

Husky Oil Operations Limited

Waste Management Summary Table

Waste Generator Number: NTG 000277

Waste Stream	Description	Handling Method	Disposal Method	AB Code	Shipping Name	PIN	CLASS	PG	Est. Volume	Comments
Absorbents	Absorbent materials used for spill clean up, hands, oil	Store in drum or plastic lined Mega Bags.	Dispose onsite in appropriate storage bin and send to an approved landfill for final disposal.	OILABS	Environmentally hazardous substance, solid, N.O.S. (pads cont/w BTEX)	UN3077	9	III	Unknown	CHECK FLASHPOINT, BTEX & SPONTANEOUS COMBUSTION
Batteries (alkali)	Alkali batteries	Wear glove,handle carefully, store in segregated storage bins as required	Transport to an approved landfill outside the NWT	BATT	Batteries, wet, filled with alkali, electric storage	UN2795	8	III	Unknown	
Batteries (Lithium Irondisulfide)	E.g. Energizer Lithium Batteries (AA, AAA)	Store separately from other wastes	Recycle using appropriate facilities	BATT	Regulated by the TDG Act and Regulation for Air Transport, under Class 9	UN3090, UN3091	9	N/A	Unknown	Must be packaged appropriately by trained personnel for Air Transport. Volumes will be noted as required. Packing Group to be determined dependant on volume of batteries.
Batteries (NiCd)	Rechargable consumer batteries	Store separately from other wastes	Recycle	BATT	Not regulated by the TDG Act and Regulation	N/A	N/A	N/A	Unknown	
Domestic Garbage	Food, Personal Sewage, burnable debris/wood	Food waste must be stored in secure, airtight (odour proof) containers	Dispose of all burnable waste in onsite incinerator, pull out plastic from the incinerator waste stream, and store in waste management bin. For Inspections or short duration work, please pack in / pack out domestic waste.	DOMWST	Domestic Waste	N/A	N/A	N/A	Unknown	EACH CY-2050-FA-D INCINERATOR UNIT CAN BURN 90KB PER HOUR OF DOMESTIC GARBAGE, AND WILL BE UTILIZED DURING MAINTENANCE CYCLE ONLY
Empty Barrels/Pails	Unrinsed barrels, jugs and other containers	Store in secure area on sides, lids on	Supplier or approved landfill / recycler outside of the NWT	EMTCON	Empty steel dums for recycle	N/A	N/A	N/A	Unknown	ENSURE EMPTY
Equipment Filters	Process (Glycol, Dips, water)	Store in on site filter container	Transport to an approved landfill outside the NWT	FILOTH	Environmentally hazardous substance, solid N.O.S. (waste filters BTEX)	UN3077	9	III	Unknown	MAY HAVE A SMALL AMOUNT DURING ONE MAINTENANCE CYCLE
Incinerator Ash	Feed source is generally burnable domestic waste and paper products	Package in non-haz bag when cool, or transport via Incinerator Ash Bin	Transport to an approved landfill outside the NWT	INCASH	Incinerator ash (waste)	N/A	N/A	N/A	Unknown	INCINERATOR WILL ONLY BE UTILIZED DURING MAINTENANCE CYCLE
Lube Oils	From oil changes including hydraulic fluid	Bulk in double walled tank/drum within segregated oilfield waste bin	Used oil recycler	LUBOIL	Non DOW, NON TDG regulated	N/A	N/A	N/A	Unknown	USE ONSITE SEGREGATED BINS WITH DRUMS FOR STORAGE ONSITE.
Untreated Sewage	Untreated sewage - utilize compostable bag for personal use.	Worksite will require small compostable bags to capture personal waste to be incinerated during a maintenance cycle.	Incineration with domestic wastes	No provincial code	Not regulated by the TDG Act and Regulations	N/A	N/A	N/A	Unknown	USE ONSITE INCINERATOR, MIXED WITH DOMESTIC WASTE STREAMS. USED ONLY DURING MAINTENANCE CYCLE
Treated Sewage	Treated sewage fluids will be dispersed to the environment following parameters in associated water licence. Sewage Solids hauled to an approved municipal lagoon outside of NT.	Piping and lift stations will be used to capture sewage from well site trailers to the treatment plant.	Treated effluent dispersed to environment, Solids hauled to approved lagoon outside of the NT.	No provincial code	Not regulated by the TDG Act and Regulations	N/A	N/A	N/A	30 m3 per month - effluent, 2.5 - 15m3 solids to facility	ONLY IF REQUIRED DURING MAINTENANCE CYCLE
Scrap Metal	Not contaminated with chemicals	Stockpile onsite, and load into waste bin if available.	Local scrap metal dealer or approved landfill outside of the NWT	SMETAL	Scrap metal	N/A	N/A	N/A	Unknown	
Soil/Debris (BTEX)	BTEX> 0.5 mg/L TCLP	Stockpile onsite	Transport to an approved landfill outside the NWT	SOILCH	Environmentally hazardous substance, soild N.O.S.(waste soil with BTEX)	UN3077	9	III	Unknown	CHECK FLASHPOINT< BTEX
Soil/Debris (oil)	FP> 60.5 C, no metals	Stockpile onsite	Transport to an approved landfill outside the NWT	SOILRO	Soil cont/w oil (waste)	N/A	N/A	N/A	Unknown	CHECK LEAD
Waste Flammable Liquids	Diesel, gasoline, jet fuel	Store in approved drums	Approved recycling facility	WSTFLQ	Flammable liquid, N.O.S. (waste)	UN1993	3	II	Unknown	
Wood Materials	Lathes, wood boards, boxes	Incinerate what can be incinerated and stockpile the remainder. Rough lumber, obtain burn permit on burn onsite.	Recycle, reuse, burn or place in a sanitary landfill	No Provincial Code	Not regulated by the TDG Act and Regulations	N/A	N/A	N/A	Unknown	

Notes:

1. Use Appropriate Movement Document for the transport of all Hazardous waste tpyes between borders.

2. Use a Bill of Lading or Husky Movement Document for the transport of all Non-hazardous waste types.

3. DOW = Dangerous Oilfield Waste

Appendix A-2 – Safety Data Sheets

SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: **UNLEADED GASOLINE**
Product Description: Hydrocarbons and Additives
SDS Number: 8522

Intended Use: Fuel

Trade Names	Trade Names
AUTOMOTIVE GASOLINE	ESSO EXTRA GASOLINE
ESSO MIDGRADE GASOLINE	ESSO PREMIUM GASOLINE
ESSO REGULAR GASOLINE	ESSO SUPREME GASOLINE
EXXON MIDGRADE GASOLINE	EXXON PREMIUM GASOLINE
EXXON REGULAR GASOLINE	GASOLINE MIDGRADE UNLEADED MUL89
GASOLINE MIDGRADE UNLEADED MUL89 DCA	GASOLINE MIDGRADE UNLEADED MUL89 DCA DYED
GASOLINE MIDGRADE UNLEADED MUL89 LDCA	GASOLINE MIDGRADE UNLEADED MUL89 LDCA DYED
GASOLINE PREMIUM UNLEADED PUL91	GASOLINE PREMIUM UNLEADED PUL91 DCA
GASOLINE PREMIUM UNLEADED PUL91 DCA DYED	GASOLINE PREMIUM UNLEADED PUL91 LDCA
GASOLINE PREMIUM UNLEADED PUL91 LDCA DYED	GASOLINE RBOB BLENDSTOCK P91
GASOLINE RBOB BLENDSTOCK R87	GASOLINE REGULAR UNLEADED RUL87
GASOLINE REGULAR UNLEADED RUL87 DCA	GASOLINE REGULAR UNLEADED RUL87 DCA DYED
GASOLINE REGULAR UNLEADED RUL87 DYED	GASOLINE REGULAR UNLEADED RUL87 LDCA
GASOLINE REGULAR UNLEADED RUL87 LDCA DYED	

COMPANY IDENTIFICATION

Supplier: **Imperial Oil Downstream**
P.O. Box 2480, Station M
Calgary, ALBERTA T2P 3M9 Canada

24 Hour Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 HAZARD IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

CLASSIFICATION:

Flammable Liquids — Category 1
Skin Irritation — Category 2
Germ Cell Mutagenicity — Category 1B
Carcinogenicity — Category 1B
Reproductive Toxicity (Developmental) — Category 2
Specific Target Organ Toxicity — Single Exposure (Central Nervous System) — Category 3
Aspiration Hazard — Category 1

LABEL:
Pictogram:

Signal Word: Danger

Hazard Statements:
H224: Extremely flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H336: May cause drowsiness or dizziness. H340: May cause genetic defects. H350: May cause cancer. H361: Suspected of damaging the unborn child.

Precautionary Statements:
P101: If medical advice is needed, have product container or label at hand. P102: Keep out of reach of children. P103: Read label before use.P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233: Keep container tightly closed. P240: Ground and bond container and receiving equipment. P241: Use explosion-proof electrical, ventilating and lighting equipment. P242: Use non-sparking tools. P243: Take action to prevent static discharges. P261: Avoid breathing mist / vapours. P264: Wash skin thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection.P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P308 + P313: IF exposed or concerned: Get medical advice/attention. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P331: Do NOT induce vomiting. P332 + P313: If skin

irritation occurs: Get medical advice/attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish. P391: Collect spillage.P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up.P501: Dispose of contents and container in accordance with local regulations.

Contains: BENZENE; GASOLINE; TOLUENE

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS

Material can accumulate static charges which may cause an ignition. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. Exposure to benzene is associated with cancer (acute myeloid leukaemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders (see Section 11).

ENVIRONMENTAL HAZARDS

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

NFPA Hazard ID:	Health:	2	Flammability:	3	Reactivity:	0
HMIS Hazard ID:	Health:	2*	Flammability:	3	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 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) in Hazardous product

Name	CAS#	Concentration*	GHS Hazard Codes
ETHYL ALCOHOL	64-17-5	0 - 1%	H225, H319(2A)
GASOLINE	86290-81-5	98 - 100%	H224, H304, H336, H340(1B), H350(1B), H361(D), H315, H401, H411

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*	GHS Hazard Codes
BENZENE	71-43-2	0 - 1.5%	H225, H303, H304, H340(1B), H350(1A), H315,

			H319(2A), H372, H401, H412
CUMENE	98-82-8	0 - 1%	H226, H304, H335, H351, H401, H411
CYCLOHEXANE	110-82-7	0 - 1.5%	H225, H304, H336, H315, H400(M factor 1), H410(M factor 1)
ETHYL BENZENE	100-41-4	0 - 3.5%	H225, H304, H332, H373, H401, H412
N-HEXANE	110-54-3	0 - 5%	H225, H304, H336, H361(F), H315, H373, H401, H411
NAPHTHALENE	91-20-3	0 - 1%	H228(2), H302, H351, H400(M factor 1), H410(M factor 1)
TOLUENE	108-88-3	0 - 20%	H225, H304, H336, H361(D), H315, H373, H401, H412
XYLENES	1330-20-7	0 - 20%	H226, H303, H304, H312, H332, H335, H315, H320(2B), H373, H401, H412

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

NOTE: The concentration of the components shown above may vary substantially. In certain countries, benzene content may be limited to lower levels. Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present. Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane, and isopentane. The reportable component percentages, shown in the composition/information on ingredients section, are based on API's evaluation of a typical gasoline mixture.

SECTION 4 FIRST-AID MEASURES

INHALATION

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. 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

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. This material, or a component, may be associated with cardiac sensitization following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.

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. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. 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: Extremely Flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

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

FLAMMABILITY PROPERTIES

Flash Point [Method]: -40°C (-40°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)

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. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the 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: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H2S, 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 aromatic hydrocarbons are recommended. Note: 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: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. 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 all personal contact. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put petrol into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapour and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) during safety critical tasks, such as bulk fuel loading or unloading operations, or in storage areas where vapours may be present, unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds 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. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature,

presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The type of container used to store the material may affect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
BENZENE		STEL	1 ppm			Supplier
BENZENE		TWA	0.5 ppm			Supplier
BENZENE		STEL	2.5 ppm		Skin	ACGIH
BENZENE		TWA	0.5 ppm		Skin	ACGIH
CUMENE		TWA	5 ppm		Skin	Supplier
CUMENE		TWA	50 ppm			ACGIH
CYCLOHEXANE		TWA	100 ppm			ACGIH
ETHYL ALCOHOL		STEL	1000 ppm			ACGIH
ETHYL BENZENE		TWA	20 ppm			ACGIH
GASOLINE		STEL	200 ppm			Supplier
GASOLINE		TWA	100 ppm			Supplier
GASOLINE		STEL	500 ppm			ACGIH
GASOLINE		TWA	300 ppm			ACGIH
N-HEXANE		TWA	50 ppm		Skin	ACGIH
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH
TOLUENE		TWA	20 ppm			ACGIH
XYLENES		STEL	150 ppm			ACGIH
XYLENES		TWA	100 ppm			ACGIH

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:

Use explosion-proof ventilation equipment to stay below exposure limits.

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 protection is ordinarily required under normal 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:

Chemical resistant gloves are recommended.

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:

Chemical/oil resistant clothing is recommended.

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

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Clear (May Be Dyed)
Odour: Petroleum/Solvent
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.74

Flammability (Solid, Gas): N/A
Flash Point [Method]: -40°C (-40°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)
Boiling Point / Range: > 20°C (68°F) - 225°C (437°F)
Decomposition Temperature: N/D
Vapour Density (Air = 1): 3.2 at 101 kPa
Vapour Pressure: > 26.6 kPa (200 mm Hg) at 20ºC | 76 kPa (570 mm Hg) at 38 °C - 103 kPa (772.5 mm Hg) at 38°C
Evaporation Rate (n-butyl acetate = 1): > 10
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3
Solubility in Water: Negligible
Viscosity: <1 cSt (1 mm2/sec) at 40ºC | 0.8 cSt (0.8 mm2/sec) at 20°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Alkalies, Halogens, Strong Acids, Strong oxidizers

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

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: (Rat) 4 hour(s) LC50 > 5000 mg/m3 (Vapour)	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Acute Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 401
Skin	
Acute Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 402
Skin Corrosion/Irritation: No end point data	Irritating to the skin. Based on test data for structurally similar

for material.	materials.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: Data available.	Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available.	Caused genetic effects in laboratory animals, but the relevance to humans is uncertain. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 475 476
Carcinogenicity: Data available.	Caused cancer in laboratory animals. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 451
Reproductive Toxicity: Data available.	Caused damage to the fetus in laboratory animals, but the relevance to humans is uncertain. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	May cause drowsiness or dizziness.
Repeated Exposure: Data available.	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 410 412 453

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
ETHYL BENZENE	Inhalation Lethality: 4 hour(s) LC50 17.8 mg/l (Vapour) (Rat); Oral Lethality: LD 50 3.5 g/kg (Rat)
NAPHTHALENE	Inhalation Lethality: 4 hour(s) LC50 > 0.4 mg/l (Max attainable vapor conc.) (Rat); Oral Lethality: LD 50 533 mg/kg (Mouse)

OTHER INFORMATION

For the product itself:

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapours in the same boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats, male and female mice, or in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. In 1991, The U.S. EPA determined that the male rat kidney is not useful for assessing human risk. Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema. Exposure to this material, or one of its components, in situations where there is the potential for high levels, such as in confined spaces or with abuse, may result in abnormal heart rhythm (arrhythmia). High-level exposure to

hydrocarbons (above occupational exposure limits) may initiate arrhythmia in a worker that is undergoing stress or is taking a heart-stimulating substance such as epinephrine, a nasal decongestant, or an asthma or cardiovascular drug.

Contains:

BENZENE: Caused cancer (acute myeloid leukemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders in human studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus and cancer in laboratory animal studies. CUMENE: Repeated inhalation exposure of cumene vapour produced damage in the kidney of male rats only. These effects are believed to be species specific and are not relevant to humans. ETHANOL: Prolonged or repeated exposure to high concentrations of ethanol vapour or overexposure by ingestion may produce adverse effects to brain, kidney, liver, and reproductive organs, birth defects in offspring, and developmental toxicity in offspring. GASOLINE UNLEADED: Carcinogenic in animal tests. Chronic inhalation studies resulted in liver tumours in female mice and kidney tumours in male rats. Neither result considered significant for human health risk assessment by the United States EPA and others. Did not cause mutations in-vitro or in-vivo. Negative in inhalation developmental studies and reproductive tox studies. Inhalation of high concentrations in animals resulted in reversible central nervous system depression, but no persistent toxic effect on the nervous system. Non-sensitizing in test animals. Caused nerve damage in humans from abusive use (sniffing). NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

N-HEXANE: Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown. TOLUENE : Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects. ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

CMR Status:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	1, 4, 5
CUMENE	98-82-8	3, 4
CYCLOHEXANE	110-82-7	4
ETHYL ALCOHOL	64-17-5	4
ETHYL BENZENE	100-41-4	3, 4
GASOLINE	86290-81-5	3, 4
N-HEXANE	110-54-3	4
NAPHTHALENE	91-20-3	3, 4
TOLUENE	108-88-3	4
XYLENES	1330-20-7	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 for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

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

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile 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:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- 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)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Marine Pollutant: Yes

Special Provisions: 17, 88, 98, 150

Footnote: Marine Pollutant designation is applicable only if shipped over water.

LAND (DOT)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
ID Number: 1203
Packing Group: II
ERG Number: 128
Label(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II

SEA (IMDG)

Proper Shipping Name: MOTOR SPIRIT or GASOLINE or PETROL
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1203
Packing Group: II
Marine Pollutant: No
Label(s): 3
Transport Document Name: UN1203, MOTOR SPIRIT or GASOLINE or PETROL, 3, PG II, (-40°C c.c.)

AIR (IATA)

Proper Shipping Name: MOTOR SPIRIT or GASOLINE or PETROL
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Label(s) / Mark(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II

SECTION 15 REGULATORY INFORMATION

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

Listed or exempt from listing/notification on the following chemical inventories (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): AIIC, DSL, ENCS, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	6
CUMENE	98-82-8	6
CYCLOHEXANE	110-82-7	6
ETHYL BENZENE	100-41-4	6
N-HEXANE	110-54-3	6

NAPHTHALENE	91-20-3	6
TOLUENE	108-88-3	6
XYLENES	1330-20-7	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

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H224: Extremely flammable liquid and vapor; Flammable Liquid, Cat 1
H225: Highly flammable liquid and vapor; Flammable Liquid, Cat 2
H226: Flammable liquid and vapour; Flammable Liquid, Cat 3
H302: Harmful if swallowed; Acute Tox Oral, Cat 4
H303: May be harmful if swallowed; Acute Tox Oral, Cat 5
H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
H312: Harmful in contact with skin; Acute Tox Dermal, Cat 4
H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
H319(2A): Causes serious eye irritation; Serious Eye Damage/Irr, Cat 2A
H320(2B): Causes eye irritation; Serious Eye Damage/Irr, Cat 2B
H332: Harmful if inhaled; Acute Tox Inh, Cat 4
H335: May cause respiratory irritation; Target Organ Single, Resp Irr
H336: May cause drowsiness or dizziness; Target Organ Single, Narcotic
H340(1B): May cause genetic defects; Germ Cell Mutagenicity, Cat 1B
H350(1A): May cause cancer; Carcinogenicity, Cat 1A
H350(1B): May cause cancer; Carcinogenicity, Cat 1B
H351: Suspected of causing cancer; GHS Carcinogenicity, Cat 2
H361(D): Suspected of damaging the unborn child; Repro Tox, Cat 2 (Develop)
H361(F): Suspected of damaging fertility; Repro Tox, Cat 2 (Fertility)
H372: Causes damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 1
H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H401: Toxic to aquatic life; Acute Env Tox, Cat 2
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2
H412: Harmful to aquatic life with long lasting effects; Chronic Env Tox, Cat 3

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Composition: Component table information was modified.
GHS Health Symbol information was modified.
GHS Physical/Chemical Symbol information was modified.
Section 02: GHS Contains for LABEL_GHS codes information was modified.
Section 08: Exposure Limits Table information was modified.
Section 09 Viscosity information was added.
Section 11 Substance Toxicology table information was modified.

Section 11: Tox List Cited Table information was modified.
Section 14: Proper Shipping Name information was modified.
Section 15: Canadian List Citations Table information was modified.
Section 15: National Chemical Inventory Listing information was modified.

DGN: 5007481 (1006754)

SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: (see Section 16 for Synonyms) **LIGHT DISTILLATE**
Product Description: Petroleum Distillates
SDS Number: 8529
Product Code: 10102015
Intended Use: Fuel/solvent/blend stock

COMPANY IDENTIFICATION

Supplier: **Imperial Oil Downstream**
P.O. Box 2480, Station M
Calgary, ALBERTA T2P 3M9 Canada

24 Hour Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 HAZARD IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

CLASSIFICATION:

Flammable Liquids — Category 3
Acute Toxicity (Inhalation) — Category 4
Skin Irritation — Category 2
Carcinogenicity — Category 2
Specific Target Organ Toxicity — Single Exposure (Central Nervous System) — Category 3
Specific Target Organ Toxicity — Repeated Exposure — Category 2
Aspiration Hazard — Category 1

LABEL:
Pictogram:

Signal Word: Danger

Hazard Statements:
H226: Flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H332: Harmful if inhaled. H336: May cause drowsiness or dizziness. H351: Suspected of causing cancer. H373: May cause damage to organs through prolonged or repeated exposure. Blood, Bone marrow, Liver, Spleen, Thymus

Precautionary Statements:
P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233: Keep container tightly closed. P240: Ground and bond container and receiving equipment. P241: Use explosion-proof electrical, ventilating and lighting equipment. P242: Use non-sparking tools. P243: Take action to prevent static discharges. P260: Do not breathe mist / vapours. P264: Wash skin thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection.P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P308 + P313: IF exposed or concerned: Get medical advice/attention. P331: Do NOT induce vomiting. P332 + P313: If skin irritation occurs: Get medical advice/attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish. P391: Collect spillage.P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up.P501: Dispose of contents and container in accordance with local regulations.

Contains: KEROSENE, STRAIGHT RUN; LIGHT HYDROCRACKED DISTILLATE (PETROLEUM); NAPHTHALENE

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS

Material can accumulate static charges which may cause an ignition. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. May be irritating to the eyes, nose, throat, and lungs.

ENVIRONMENTAL HAZARDS

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

NFPA Hazard ID:	Health:	2	Flammability:	2	Reactivity:	0
HMIS Hazard ID:	Health:	2*	Flammability:	2	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 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) in Hazardous product

Name	CAS#	Concentration*	GHS Hazard Codes
KEROSENE, STRAIGHT RUN	8008-20-6	0 - 100%	H226, H304, H336, H315, H401, H411
LIGHT ATMOSPHERIC GAS OIL	64741-44-2	0 - 100%	H304, H401, H411
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	64741-77-1	0 - 100%	H304, H332, H351, H315, H373, H401, H411

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*	GHS Hazard Codes
NAPHTHALENE	91-20-3	0.8%	H228(2), H302, H351, H400(M factor 1), H410(M factor 1)

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4 FIRST-AID MEASURES

INHALATION

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. 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

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Contains hydrocarbon solvent/petroleum hydrocarbons; skin contact may aggravate an existing dermatitis.

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: Combustible. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

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

FLAMMABILITY PROPERTIES

Flash Point [Method]: 40°C (104°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
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. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the 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.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. Warn other shipping. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. 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 breathing mists or vapour. Avoid all personal contact. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds 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).

Loading/Unloading Temperature: N/D

Transport Temperature: N/D
Transport Pressure: N/D

Static Accumulator: This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

STORAGE

The type of container used to store the material may affect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Fixed storage

containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.
Storage Temperature: N/D
Storage Pressure: N/D

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
KEROSENE, STRAIGHT RUN	Stable Aerosol.	TWA	5 mg/m3		Skin	Supplier
KEROSENE, STRAIGHT RUN	Vapour.	TWA	200 mg/m3		Skin	Supplier
KEROSENE, STRAIGHT RUN [as total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m3		Skin	ACGIH
LIGHT ATMOSPHERIC GAS OIL	Stable Aerosol.	TWA	5 mg/m3		Skin	Supplier
LIGHT ATMOSPHERIC GAS OIL	Vapour.	TWA	200 mg/m3		Skin	Supplier
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	Stable Aerosol.	TWA	5 mg/m3		Skin	Supplier
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	Vapour.	TWA	200 mg/m3		Skin	Supplier
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH

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:

Use explosion-proof ventilation equipment to stay below exposure limits.

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:

Half-face filter respirator

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:

Chemical resistant gloves are recommended.

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:

Chemical/oil resistant clothing is recommended.

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

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Pale Yellow
Odour: Petroleum/Solvent
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.85
Flammability (Solid, Gas): N/A
Flash Point [Method]: 40°C (104°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: 180°C (356°F) - 320°C (608°F) [Estimated]
Decomposition Temperature: N/D
Vapour Density (Air = 1): N/D
Vapour Pressure: [N/D at 20°C] | < 1 kPa (7.5 mm Hg) at 38°C
Evaporation Rate (n-butyl acetate = 1): < 1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Negligible
Viscosity: 1.7 cSt (1.7 mm2/sec) at 40ºC
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -39°C (-38°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Strong oxidizers

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

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Moderately toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Moderately irritating to skin with prolonged exposure. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Caused cancer in laboratory animals, but the relevance to humans is uncertain. Based on assessment of the components.
Reproductive Toxicity: No end point data	Not expected to be a reproductive toxicant. Based on assessment

for material.	of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	May cause drowsiness or dizziness.
Repeated Exposure: No end point data for material.	Concentrated, prolonged or deliberate exposure may cause organ damage. Based on assessment of the components.

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
NAPHTHALENE	Inhalation Lethality: 4 hour(s) LC50 > 0.4 mg/l (Max attainable vapor conc.) (Rat); Oral Lethality: LD 50 533 mg/kg (Mouse)

OTHER INFORMATION

For the product itself:

Target Organs Repeated Exposure: Blood, Bone marrow, Liver, Spleen, Thymus

Vapour/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness and other central nervous system effects including death. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

KEROSENE: Carcinogenic in animal tests. Lifetime skin painting tests produced tumours, but the mechanism is due to repeated cycles of skin damage and restorative hyperplasia. This mechanism is considered unlikely in humans where such prolonged skin irritation would not be tolerated. Did not cause mutations in-vitro. Inhalation of vapours did not result in reproductive or developmental effects in laboratory animals. Inhalation of high concentrations in animals resulted in respiratory tract irritation, lung changes and some reduction in lung function. Non-sensitizing in animal tests. MIDDLE DISTILLATES WITH CRACKED STOCKS: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function. NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

CMR Status:

Chemical Name	CAS Number	List Citations
KEROSENE, STRAIGHT RUN	8008-20-6	4
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	64741-77-1	1, 6
NAPHTHALENE	91-20-3	3, 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 for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

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

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. 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:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- 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)

Proper Shipping Name: DIESEL FUEL

Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Marine Pollutant: Yes
Special Provisions: 88, 150

Footnote: Marine Pollutant designation is applicable only if shipped over water.

LAND (DOT)

Proper Shipping Name: DIESEL FUEL
Hazard Class & Division: 3
ID Number: 1993
Packing Group: III
ERG Number: 128
Label(s): None
Transport Document Name: UN1993, DIESEL FUEL, 3, PG III

Footnote: The flash point of this material is greater than 38ºC/100ºF. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid. This material is not regulated under 49 CFR in a container of 450 litre/119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

SEA (IMDG)

Proper Shipping Name: HEATING OIL, LIGHT
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1202
Packing Group: III
Marine Pollutant: Yes
Label(s): 3
Transport Document Name: UN1202, HEATING OIL, LIGHT, 3, PG III, (40°C c.c.), MARINE POLLUTANT

AIR (IATA)

Proper Shipping Name: HEATING OIL, LIGHT
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Label(s) / Mark(s): 3
Transport Document Name: UN1202, HEATING OIL, LIGHT, 3, PG III

SECTION 15 REGULATORY INFORMATION

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

Listed or exempt from listing/notification on the following chemical inventories (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): DSL, TSCA

Special Cases:

Inventory	Status
AIIC	Not determined
ENCS	Not determined
IECSC	Not determined
KECI	Not determined
PICCS	Not determined

The Following Ingredients are Cited on the Lists Below: None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2
3 = TSCA 5e
4 = TSCA 6
5 = TSCA 12b
6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H226: Flammable liquid and vapour; Flammable Liquid, Cat 3
H302: Harmful if swallowed; Acute Tox Oral, Cat 4
H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
H332: Harmful if inhaled; Acute Tox Inh, Cat 4
H336: May cause drowsiness or dizziness; Target Organ Single, Narcotic
H351: Suspected of causing cancer; GHS Carcinogenicity, Cat 2
H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H401: Toxic to aquatic life; Acute Env Tox, Cat 2
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Composition: Component table information was modified.
GHS Health Symbol information was modified.
GHS Physical Hazards information was modified.
GHS Physical/Chemical Symbol information was modified.
GHS Precautionary Statements - Prevention information was modified.
Section 02: GHS Contains for LABEL_GHS codes information was modified.
Section 08: Exposure Limits Table information was modified.
Section 11 Substance Toxicology table information was modified.
Section 11: Tox List Cited Table information was modified.
Section 12: information was modified.
Section 14: Special Provisions information was added.
Section 15: Special Cases Table information was modified.
Section 15: WHMIS Classification information was deleted.
Section 16: Synonyms information was modified.

SYNONYMS: AUTOMOTIVE (ON-ROAD) DIESEL FUEL, DIESEL ARCTIC, DIESEL FUEL, FURNACE FUEL LIGHT DYED, MC SOLVENT, STOVE OIL, STOVE OIL DYED, DIESEL LOW SULPHUR LIGHT, DIESEL LOW SULPHUR LIGHT DYED, DIESEL LOW SULPHUR LIGHT RAIL, DIESEL REGULAR SULPHUR LIGHT DYED, FURNACE FUEL LIGHT

DGN: 5007490 (1025510)

SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: **HYJET IV-A PLUS**
Product Description: Synthetic Base Stocks and Additives
SDS Number: 14249
Product Code: 201550303010
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier:
Imperial Oil Downstream
P.O. Box 2480, Station M
Calgary, ALBERTA T2P 3M9 Canada

24 Hour Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 HAZARD IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

CLASSIFICATION:

Acute Toxicity (Oral) — Category 4
Eye Irritation — Category 2A
Reproductive Toxicity (Developmental) — Category 2
Reproductive Toxicity (Fertility) — Category 2
Specific Target Organ Toxicity — Repeated Exposure — Category 2

LABEL:
Pictogram:

Signal Word: Warning

Hazard Statements:
H361: Suspected of damaging fertility or the unborn child. H302: Harmful if swallowed. H319: Causes serious eye irritation. H373: May cause damage to organs through prolonged or repeated exposure. Liver, Adrenal

Precautionary Statements:
P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P260: Do not breathe mist / vapours. P264: Wash skin thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection.P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308 + P313: IF exposed or concerned: Get medical advice/attention. P314: Get medical advice/attention if you feel unwell. P330: Rinse mouth. P337 + P313: If eye irritation persists: Get medical advice/attention. P391: Collect spillage.P405: Store locked up.P501: Dispose of contents and container in accordance with local regulations.

Contains: PHENOL, ISOPROPYLATED, PHOSPHATE (3:1) [TRIPHENYL PHOSPHATE > 5%]; TRIBUTYL PHOSPHATE

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS
No significant hazards.

HEALTH HAZARDS
High-pressure injection under skin may cause serious damage. When heated, the vapour/fumes given off may cause respiratory tract irritation.

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

NFPA Hazard ID:	Health:	2	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	2*	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 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) in Hazardous product

Name	CAS#	Concentration*	GHS Hazard Codes
2,6-DI-TERT-BUTYL-P-CRESOL**	128-37-0	0.1 - 1%	H400(M factor 1), H410(M factor 1)
CALCIUM ALKYLNAPHTHALENESULFONATE/CARBOXYLATE**	57855-77-3	0.1 - 1%	H315, H319(2A), H317
PHENOL, ISOPROPYLATED, PHOSPHATE (3:1) [TRIPHENYL PHOSPHATE > 5%]**	68937-41-7	7 - 13%	H361(D), H361(F), H373, H401, H410(M factor 1)
TRIBUTYL PHOSPHATE**	126-73-8	60 - 80%	H302, H315, H402, H412

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
**The exact ingredient concentration or range has been withheld as a trade secret.

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. Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. 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 for at least 15 minutes. Get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

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: May generate irritating and harmful gases/vapours/fumes when burning. Pressurised mists may form a flammable mixture. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Nitrogen oxides, Phosphorus oxides, Smoke, Fume, Sulphur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: 160°C (320°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: 400°C (752°F)

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. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the 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.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. Ventilate the area. Recover by pumping or with suitable absorbent. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Water Spill: Stop leak if you can do so without risk. Material will sink. Remove material, as much as possible, using mechanical equipment.

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 all personal contact. Avoid vapour from heated materials to prevent exposure to potentially toxic/irritating fumes. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
2,6-DI-TERT-BUTYL-P-CRESOL**	Inhalable fraction and vapour	TWA	2 mg/m3			ACGIH
TRIBUTYL PHOSPHATE**	Inhalable fraction and vapour	TWA	5 mg/m3			ACGIH

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:

Adequate ventilation should be provided so that exposure limits are not exceeded.

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 protection is ordinarily required under normal 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:

Chemical resistant gloves are recommended.

Eye Protection: Chemical goggles 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:

Chemical/oil resistant clothing is recommended.

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

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Form: Clear
Colour: Violet
Odour: Sweet
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 1.001
Flammability (Solid, Gas): N/A
Flash Point [Method]: 160°C (320°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: 400°C (752°F)
Boiling Point / Range: 288°C (550°F)
Decomposition Temperature: N/D
Vapour Density (Air = 1): N/D
Vapour Pressure: 0.067 kPa (0.5 mm Hg) at 20ºC
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/D
Log Pow (n-Octanol/Water Partition Coefficient): N/D

Solubility in Water: Negligible
Viscosity: 10.1 cSt (10.1 mm2/sec) at 40ºC | 3.5 cSt (3.5 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/D
Pour Point: < -62°C (-80°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat.

MATERIALS TO AVOID: Strong oxidizers

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

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Acute Toxicity (Rat): LD 50 1671 mg/kg	Slightly Toxic. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 401
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation (Rabbit): Data available.	Irritating and will injure eye tissue. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.

Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Caused damage to fertility in laboratory animals, but the relevance to humans is uncertain. Caused damage to the fetus in laboratory animals, but the relevance to humans is uncertain. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Concentrated, prolonged or deliberate exposure may cause organ damage. Based on assessment of the components.

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
TRIBUTYL PHOSPHATE**	Oral Lethality: LD 50 1552 ml/kg (Rat)

OTHER INFORMATION

For the product itself:

Target Organs Repeated Exposure: Liver, Adrenal

Component concentrations in this formulation would not be expected to cause skin sensitization, based on tests of the components, this formulation, or similar formulations.

Contains:

Tributyl phosphate (TBP): Studies in rats have shown an increased incidence of urinary bladder tumors following long-term feeding of TBP in the diet. No bladder tumors were observed in similar studies in mice. The relevance of these findings for humans is uncertain.

Isopropylphenyl phosphate (iPP). Reproductive / developmental toxicity screening studies in rats of products containing high concentrations of iPP adversely affected male and female reproductive performance with significant reductions in fertility and conception indices. Number of rat pups born and live litter size were decreased in groups exposed to the iPP-containing products, while pup mortality was increased.

CMR Status: None.

Chemical Name	CAS Number	List Citations
TRIBUTYL PHOSPHATE**	126-73-8	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 for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

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

Material -- Expected to be harmful to aquatic organisms.

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

Dispose of waste at an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants. Product is suitable for burning in an enclosed, controlled burner for fuel value or disposal by supervised incineration.

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

Footnote: Regulated under TDG as UN 3082, Environmentally Hazardous Substance, liquid, Class 9, Marine Pollutant, only when transported by ship.

LAND (DOT): Not Regulated for Land Transport

Footnote: This material is not regulated under 49 CFR if in a container of 119 gallon capacity or less, except when transported by vessel.

SEA (IMDG)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (PHENOL, ISOPROPYLATED, PHOSPHATE (3:1) [TRIPHENYL PHOSPHATE > 5%])
Hazard Class & Division: 9
EMS Number: F-A, S-F
UN Number: 3082
Packing Group: III
Marine Pollutant: Yes
Label(s): 9
Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (PHENOL, ISOPROPYLATED, PHOSPHATE (3:1) [TRIPHENYL PHOSPHATE > 5%]), 9, PG III

Footnote: Not subject to the provisions of UN3082 Environmentally hazardous substances liquid, n.o.s., if shipped in quantities of 5 liters or less per single or inner combination packaging as per IMDG code 2.10.2.7.

AIR (IATA)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (PHENOL, ISOPROPYLATED, PHOSPHATE (3:1) [TRIPHENYL PHOSPHATE > 5%])
Hazard Class & Division: 9
UN Number: 3082
Packing Group: III
Label(s) / Mark(s): 9, EHS
Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (PHENOL, ISOPROPYLATED, PHOSPHATE (3:1) [TRIPHENYL PHOSPHATE > 5%]), 9, PG III

[Footnote: Not subject to the provisions of UN3082 Environmentally hazardous substances liquid, n.o.s., if shipped in quantities of 5 liters or less per single or inner combination packaging as per Special Provision A197.]

SECTION 15 REGULATORY INFORMATION

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

Listed or exempt from listing/notification on the following chemical inventories (May contain substance(s) subject to notification to the EPA Active TSCA inventory prior to import to USA): AICS, DSL, IECSC, TSCA
Special Cases:

Inventory	Status
KECI	Restrictions Apply

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
CYCLOHEXANESULFONIC ACID, DECAFLUORO(PENTAFLUOROETHYL)-, POTASSIUM SALT	67584-42-3	2

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2
3 = TSCA 5e
4 = TSCA 6
5 = TSCA 12b
6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H302: Harmful if swallowed; Acute Tox Oral, Cat 4
H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
H317: May cause allergic skin reaction; Skin Sensitization, Cat 1
H319(2A): Causes serious eye irritation; Serious Eye Damage/Irr, Cat 2A
H361: Suspected of damaging fertility or the unborn child.; Repro Tox, Cat 2
H361(D): Suspected of damaging the unborn child; Repro Tox, Cat 2 (Develop)
H361(F): Suspected of damaging fertility; Repro Tox, Cat 2 (Fertility)
H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H401: Toxic to aquatic life; Acute Env Tox, Cat 2
H402: Harmful to aquatic life; Acute Env Tox, Cat 3
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
H412: Harmful to aquatic life with long lasting effects; Chronic Env Tox, Cat 3

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Updates made in accordance with implementation of GHS requirements.

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DGN: 5012375 (1028011)

SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: **DIESEL EXHAUST FLUID**
Product Description: Chemical Mixture
SDS Number: 20459
Product Code: 351010108210
Intended Use: Reducing Agent

COMPANY IDENTIFICATION

Supplier: **Imperial Oil Downstream**
P.O. Box 2480, Station M
Calgary, ALBERTA T2P 3M9 Canada

24 Hour Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 HAZARD IDENTIFICATION

This material is considered to be NON-HAZARDOUS according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

May be irritating to the eyes, nose, throat, and lungs. Mildly irritating to skin with prolonged exposure.

ENVIRONMENTAL HAZARDS

Expected to be harmful to aquatic organisms.

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

HMIS Hazard ID: Health: 1 Flammability: 0 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 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	GHS Hazard Codes
AMMONIA	7664-41-7	0.1 - < 1%	H221, H280, H331, H314(1B), H400(M factor 1)
UREA	57-13-6	30 - 50%	None

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

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. Remove contaminated clothing. Launder contaminated clothing before reuse.

EYE CONTACT

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

INGESTION

Seek immediate medical attention. Do not induce vomiting.

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: Exposure to fire can generate toxic fumes.

Hazardous Combustion Products: Ammonia, Nitrogen oxides, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >100°C (212°F) [Estimated]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
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

Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the 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.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Ventilate the area. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Water Spill: Stop leak if you can do so without risk. Warn other shipping. Material will sink. This product emulsifies, disperses or is miscible in water. Remove material, as much as possible, using mechanical equipment.

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

Remove debris in path of spill prior to oiling and remove contaminated debris from shoreline and water surface. Dispose of according to local regulations. 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 type of container used to store the material may affect static accumulation and dissipation. Store in a cool, dry place with adequate ventilation. Keep away from incompatible materials, open flames and high temperatures. Do not store in open or unlabelled containers. Keep container tightly closed and dry.
Storage Temperature: -5°C (23°F) - 30°C (86°F)

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
AMMONIA		STEL	35 ppm			ACGIH
AMMONIA		TWA	25 ppm			ACGIH
UREA	Total particulate.	TWA	10 mg/m3			OARS WEEL

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 protection is ordinarily required under normal 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:

If prolonged or repeated contact is likely, chemical-resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

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:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

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

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Colourless
Odour: Mild Ammonia-like
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 20 °C): 1.09
Flammability (Solid, Gas): N/A
Flash Point [Method]: >100°C (212°F) [Estimated]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: > 103°C (217°F)

Decomposition Temperature: N/D
Vapour Density (Air = 1): N/D
Vapour Pressure: N/D
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/D
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Complete
Viscosity: N/D
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: -11°C (12°F)
Melting Point: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Heat, sparks, flame, and build up of static electricity.

MATERIALS TO AVOID: Calcium Hypochlorite, Nitric acid, Perchlorates, Sodium hypochlorite, Strong oxidizers

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

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Mildly irritating to skin with prolonged exposure. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitisation	

Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer.
Aspiration: No end point data for material.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure. Based on assessment of the components.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
AMMONIA	Inhalation Lethality: LC50 2000 ppm (Rat); Oral Lethality: LD 50 0.35 g/kg (Rat)

OTHER INFORMATION

For the product itself:

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

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 -- Expected to be harmful to aquatic organisms.

MOBILITY

Material -- Expected to remain in water or migrate through soil.

PERSISTENCE AND DEGRADABILITY
Biodegradation:
Material -- Expected to be readily biodegradable.

BIOACCUMULATION POTENTIAL
Majority of components -- Potential to bioaccumulate is low.

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
Dispose of waste at an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. 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

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Not controlled

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

Listed or exempt from listing/notification on the following chemical inventories: DSL, TSCA

The Following Ingredients are Cited on the Lists Below: None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4	3 = TSCA 5e	5 = TSCA 12b
2 = TSCA 5a2	4 = TSCA 6	6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H221: Flammable gas; Flammable Gas, Cat 2
H280: Contains gas under pressure; may explode if heated; Pressurized Gas
H314(1B): Causes severe skin burns and eye damage; Skin Corr/Irritation, Cat 1B
H331: Toxic if inhaled; Acute Tox Inh, Cat 3
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Updates made in accordance with implementation of GHS requirements.

DGN: 7091652 (1016026)

PRODUCT SAFETY DATA SHEET

PRODUCT NAME: Energizer Battery

Type No.: L91 (AA), L92 (AAA)

Volts: 1.5

TRADE NAMES: ULTIMATE

Approximate Weight: 7.6 g. (L92) – 15 g. (L91)

CHEMICAL SYSTEM: Lithium Iron Disulfide

Designed for Recharge: No

Document Number: 12003-A

Energizer has prepared copyrighted Product Safety Datasheets to provide information on the different Eveready/Energizer battery systems. Batteries are articles as defined under the GHS and exempt from GHS classification criteria (Section 1.3.2.1.1 of the GHS). The information and recommendations set forth herein are made in good faith, for information only, and are believed to be accurate as of the date of preparation. However, ENERGIZER BATTERY MANUFACTURING, INC. MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM REFERENCE ON IT.

SECTION 1- MANUFACTURER INFORMATION

Energizer Battery Manufacturing, Inc.
25225 Detroit Rd.
Westlake, OH 44145

Telephone Number for Information:
800-383-7323 (USA / CANADA)

Date Prepared: March 2016

SECTION 2 – HAZARDS IDENTIFICATION

GHS classification: N/A

Signal Word: N/A

Hazard Classification: N/A

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful.
Inhalation: Contents of an open battery can cause respiratory irritation.
Skin Contact: Contents of an open battery can cause skin irritation.
Eye Contact: Contents of an open battery can cause severe irritation.

SECTION 3 - INGREDIENTS

IMPORTANT NOTE: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/wt.
Carbon Black (CAS# 1333-86-4)	3.5 mg/m^3 TWA	3.5 mg/m^3 TWA	0-4
1,2 Diemethoxyethane (CAS# 110-71-4)	None established	None established	2-4
1,3 Dioxolane (CAS# 646-06-0)	None established	20 ppm TWA	5-9
Graphite (CAS# 7782-42-5)	15 mg/m^3 TWA (total dust) 5 mg/m^3 TWA (respirable fraction)	2 mg/m^3 TWA (respirable fraction)	0-4
Iron Disulfide (CAS# 1309-36-0)	None established	None established	28-38
Lithium or Lithium Alloy	None established	None established	6.3-6.6 / AA 5.4-5.5 / AAA
Lithium Iodide	None established	None established	0.3-3

Non-Hazardous Components Steel (iron CAS# 65997-19-5) Plastic and Other	None established None established	None established None established	18-22 Balance

SECTION 4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give food or drink. Seek medical attention immediately. CALL NATIONAL BATTERY INGESTION HOTLINE for advice and follow-up (202-625-3333) collect day or night.
Inhalation: Provide fresh air and seek medical attention.
Skin Contact: Remove contaminated clothing and wash skin with soap and water.
Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Note: Carbon black is listed as a possible carcinogen by International Agency for Research on Cancer (IARC).

SECTION 5- FIRE FIGHTING MEASURES

In case of fire where lithium batteries are present, flood area with water or smother with a Class D fire extinguishant appropriate for lithium metal, such as Lith-X. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving lithium batteries can be controlled by flooding with water. However, the contents of the battery will react with water and form hydrogen gas. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended. A smothering agent will extinguish burning lithium batteries.

Emergency Responders should wear self-contained breathing apparatus. Burning lithium-iron disulfide batteries produce toxic and corrosive lithium hydroxide fumes and sulfur dioxide gas.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

To cleanup leaking batteries:

Ventilation Requirements: Room ventilation may be required in areas where there are open or leaking batteries.
Respiratory Protection: Avoid exposure to electrolyte fumes from open or leaking batteries.
Eye Protection: Wear safety glasses with side shields if handling an open or leaking battery.
Gloves: Use neoprene or natural rubber gloves if handling an open or leaking battery.
Battery materials should be disposed of in a leak-proof container.

SECTION 7 - HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life. In locations that handle large quantities of lithium batteries, such as warehouses, lithium batteries should be isolated from unnecessary combustibles.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult your Energizer Battery Manufacturing, Inc. representative for precautionary suggestions. Do not obstruct safety release vents on batteries. Encapsulation of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices. Damaging a lithium battery may result in an internal short circuit.
The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion.
Crushed or damaged batteries may result in a fire.
If soldering or welding to the battery is required, consult your Energizer representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

Labeling: If the Energizer label or package warnings are not visible, it is important to provide a package and/or device label stating:

WARNING: Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

Where accidental ingestion of small batteries is possible, the label should include:

WARNING: (1) Keep away from small children. If swallowed, promptly see doctor; have doctor phone (202) 625-3333 collect. (2) Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Requirements: Not necessary under normal conditions. / **Respiratory Protection:** Not necessary under normal conditions.

Eye Protection: Not necessary under normal conditions. / **Gloves:** Not necessary under normal conditions.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.):	Solid object
Upper Explosive Limits:	Not applicable for an Article
Lower Explosive Limits	Not applicable for an Article
Odor	No odor
Vapor Pressure (mm Hg @ 25°C)	Not applicable for an Article
Odor Threshold	No odor
Vapor Density (Air = 1)	Not applicable for an Article
pH	Not applicable for an Article
Density (g/cm^3)	1.7 -2.0
Melting point/Freezing Point	Not applicable for an Article
Solubility in Water (% by weight)	Not applicable for an Article
Boiling Point @ 760 mm Hg (°C)	Not applicable for an Article
Flash Point	Not applicable for an Article
Evaporation Rate (Butyl Acetate = 1)	Not applicable for an Article
Flammability	Not applicable for an Article
Partition Coefficient	Not applicable for an Article
Auto-ignition Temperature	Not applicable for an Article
Decomposition Temperature	Not applicable for an Article
Viscosity	Not applicable for an Article

SECTION 10 – STABILITY AND REACTIVITY

Lithium iron disulfide batteries contain no sulfides or cyanides and they do not meet any other reactivity criteria including "reacts violently with water" and therefore do not meet any of the criteria established in 40 CFR 261.2 for reactivity.

SECTION 11 – TOXICOLOGICAL INFORMATION

Under normal conditions of use, lithium iron disulfide batteries are non-toxic.

SECTION 12 – ECOLOGICAL INFORMATION

Issues such as ecotoxicity, persistence and bioaccumulation are not applicable for articles.

SECTION 13 – DISPOSAL CONSIDERATIONS

Lithium iron disulfide batteries are not hazardous waste per the United States Resource Conservation and Recovery Act (RCRA) - 40 CFR Part 261 Subpart C. Dispose of in accordance with all applicable federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in "strong outer packaging" that prevents spillage of contents. All original packaging for Energizer lithium batteries are compliant with these regulatory concerns.

Energizer lithium-iron disulfide batteries are exempt from the classification as dangerous goods as they meet the requirements of the special provisions listed below. (Essentially, they are properly packaged and labeled, contain less than 1 gram of lithium and pass the tests defined in UN model regulation section 38.3).

Regulatory Body	Special Provisions
ADR	188, 230, 310, 636, 656
IMDG	188, 230, 310, 957
UN	UN 3090, UN 3091
US DOT	29, A54, A100, A101
IATA 57th Edition, ICAO	Packaging Instructions 968 – 970

Energizer is registered with CHEMTREC. In the event of an incident during transport call 1-800-424-9300 (North America) or 1-703-527-3887 (International).

A global lithium label chart is provided below to summarize the current global labeling requirements.

Label Summary Chart

Shipping Mode	Li content	Net quantity wt. of batteries per package	Battery Type			
AIR	0.3g to ≤1g/cell 0.3g to ≤2g/ battery	≤2.5 kg	L91, L92, L522	YES	YES	YES
	≤0.3g/cell	≤2.5kg	All Li Coin and 2L76	NO	YES	YES
	≤0.3g/cell	>2.5kg	All Li Coin and 2L76	YES	YES	YES
Land/ Sea only	All	All	All	NO	YES	YES

SECTION 15 - REGULATORY INFORMATION

Outside of the transportation requirements noted in Section 14, lithium iron disulfide batteries marketed by Energizer Battery Manufacturing, Inc. are not regulated.

SARA/TITLE III - As an article, this battery and its contents are not subject to the requirements of the Emergency Planning and Community Right-To-Know Act.

SECTION 16 - OTHER INFORMATION

None.