



WOLVERINE MINE

WASTE MANAGEMENT PLAN

V2010-03

QML-0006

Prepared by
Yukon Zinc Corporation

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Table of Contents

1	Background	1
1.1	Scope and Objectives	1
1.2	Definitions	2
2	Waste Infrastructure	3
2.1	Landfill Area	3
2.1.1	Landfill	3
2.1.2	Incinerator	7
2.1.3	Waste Storage and Open Burn Area	7
2.2	Camp and Industrial Complex	8
2.3	Special Waste Storage Pad	8
2.4	Procon Maintenance Shop	8
2.5	Land Treatment Facility	9
3	Solid Waste Management	10
3.1	Recyclable Material	12
3.2	Burial of Solid Waste	12
3.3	Incineration	12
3.4	Open Burning	13
3.5	Used Tires	14
4	Special Waste Management	14
4.1	Waste Oil and Filters	16
4.2	Waste Diesel	16
4.3	Waste Antifreeze	16
4.4	Waste Solvents and Lubricants	16
4.5	Contaminated Snow and Soil	17
4.6	Used Aerosol Containers	17
4.7	Used Lead-Acid Batteries	17
4.8	Medical Waste	17
4.9	Waste Mill Reagents and Containers	17
5	Inspections and Record Keeping	18

List of Figures

Figure 1-1: Location of Yukon Zinc Corporation's Wolverine Mine	1
Figure 2-1: Location of Special Waste Storage Area, Landfill and Incinerator, and Waste Storage and Open Burn Area	6
Figure 3-1: Solid and Special Waste Storage and Disposal Requirements.....	11
Figure 4-1: Mill Waste Reagent Container Disposal Methods	18

List of Tables

Table 3-1: Handling, Storage and Disposal of Solid Waste	10
Table 4-1: Storage and Disposal of Special Waste	14
Table 5-1: Inspection Requirements	18
Table 5-2: Record Keeping Requirements.....	18

List of Appendices

Appendix A: Wolverine Mine Issued Environment Act Permits	
Appendix B: Landfill Area and Incinerator Sheets	
Appendix C: Special Waste MSDS	

1 Background

Yukon Zinc Corporation's (YZC) Wolverine Mine (Mine), located in the southeast Yukon (Figure 1-1) is a zinc-silver-copper-lead-gold underground mining project that will process up to 1,700 t/d of diluted ore. The Mine is expected to be in operation for a period of about nine years. For a detailed description of all Mine components, and schedule of activities, refer to the *General Site Plan 2008-04*. Reclamation and closure activities will occur over a three-year period as described in the *Wolverine Project Reclamation and Closure Plan 2008-02*.



Figure 1-1: Location of Yukon Zinc Corporation's Wolverine Mine

1.1 Scope and Objectives

This Waste Management Plan, Version 2010-03 (WMP), an Environmental Protection Plan required by Quartz Mining License QML-0006 (QML) Section 12.1, supersedes the previous version 2009-02. QML Section 12.1 requires that the WMP include:

- a) a description of the handling, collection, storage and disposal of waste for the various waste streams generated by the Undertaking, including non-hazardous solid wastes and special wastes; and
- b) a description of the management of water treatment sludges.

At this time, there is no sludge generation on-site as all underground mine and collected surface waters are pumped directly to the tailings facility for storage. It is not predicted that there will be any sludges until approximately 2012. YZC will revise the WMP to reflect operational changes, as necessary.

All wastes will be handled, stored and disposed of according to the appropriate regulations and permits issued under the Yukon Environment Act, including Environment Act Permit 4201-81-014 (Environment Act Permit) and Land Treatment Facility Permit 4202-24-022 (LTF Permit).

All personnel associated with waste handling, storage and disposal will be knowledgeable of the contents of this plan, including the conditions and requirements of the applicable permits (included in Appendix A).

1.2 Definitions

For consistency in interpretation with the contents contained herein, the following terms are defined:

- **Bear-proof container** is a container sealed to prevent the escape of attractant odours and strong enough to exclude a bear from the contents.
- **Cell** means a discrete area of a solid waste facility or dump into which solid waste is deposited for permanent disposal and includes such areas that are no longer used for that purpose.
- **Class 9 Hazardous Wastes** are miscellaneous products, substances or organisms considered to be dangerous to life, health, property, or the natural environment¹.
- **Contaminated Material** means any soil, snow, sediment, or water that has one or more parameters in excess of applicable standards in the *Contaminated Sites Regulation*.
- **Non-putrescible Waste** means any waste that contains no more than trivial amounts of putrescible materials; examples include construction waste, cardboard, demolition debris, etc.
- **Open Burning** means the combustion of material without control of the combustion air and without a stack or chimney to vent the emitted products of combustion to the atmosphere.
- **Putrescible Waste** contains organic matter that is capable of being decomposed and may be capable of attracting or providing food for wildlife (e.g., kitchen waste).
- **Solid waste** includes waste which originates from residential, commercial, industrial or institutional sources, from the demolition or construction of buildings or other structures or is specified in a solid waste management plan to be solid waste and for greater certainty includes litter, as defined the *Environment Act*, R.S.Y. 2002, c. 76, but does not include untreated brush or wood products that are not mixed with other materials.
- **Special waste** is a waste requiring special handling, storage, or destruction and prescribed as special waste by regulation whether or not the waste has any commercial value or is capable of being used for a useful purpose¹ (e.g., waste oil).
- **Waste** includes solid and special waste.

¹ Revised Statutes of the Yukon: Environment Act *Part 10 Section 118: Hazardous Substance and Pesticides* (2002)

2 Waste Infrastructure

This section outlines infrastructure where wastes are handled, stored and disposed of, including the Landfill Area, Camp, Industrial Complex, Special Waste Storage Pad, Procon Maintenance Shop, and the Land Treatment Facility. The locations of waste infrastructure are shown on Figure 2-1.

2.1 Landfill Area

The Landfill Area is located between the Airstrip and the Industrial Complex off the access Road at KM 26.2 and is comprised of the landfill; the incinerator; and the waste storage and open burn area, described below. The Environmental Department will inspect the Landfill Area weekly and fill out the Landfill Area Inspection Log sheet (Appendix B).

2.1.1 Landfill

The landfill will accommodate non-putrescible waste generated over the life of the Mine and will be operated in a manner that will facilitate landfill closure at the cessation of Mine operation. The landfill is a flat cleared area with cells for the burial of material (Picture 2-1 and Picture 2-2). The landfill contains a sea-can container to temporarily house waste generated by contractors and/or operations personnel until it is segregated by the Site Services Department for either incineration or off-site disposal or recycling (Picture 2-3). Two containers for storing large-sized waste batteries are also positioned within the landfill enclosure (Picture 2-4).



Picture 2-1: Active (middle right of picture) and future cells within the landfill. Note the electric fence that surrounds the landfill.



Picture 2-2: Active cell containing waste with cover material adjacent to the cell.



Picture 2-3: North-east section of Landfill Area showing incinerator (far left), beverage recycling container (middle green shack), and garbage drop-off sea-can (far right).



Picture 2-4: Used lead-acid battery storage containers located within the Landfill Area.

A sign at the entrance to the landfill lists conditions for use, emergency contacts and procedures, and items that may not be disposed of within the facility such as: hazardous wastes, acids, corrosives, solvents, oily wastes, explosives, or unsterilized medical waste. As per the Environment Act Permit, a gated electric exclusion fence surrounds the landfill and is operational from May 1 to October 31 (Picture 2-5), to prevent dangerous wildlife from entering the encompassed areas of the site. If there are tracks or other signs of dangerous wildlife attempting to access the landfill, the fence will be activated between November 1 and April 30.



Picture 2-5: High Voltage Bear Fence.

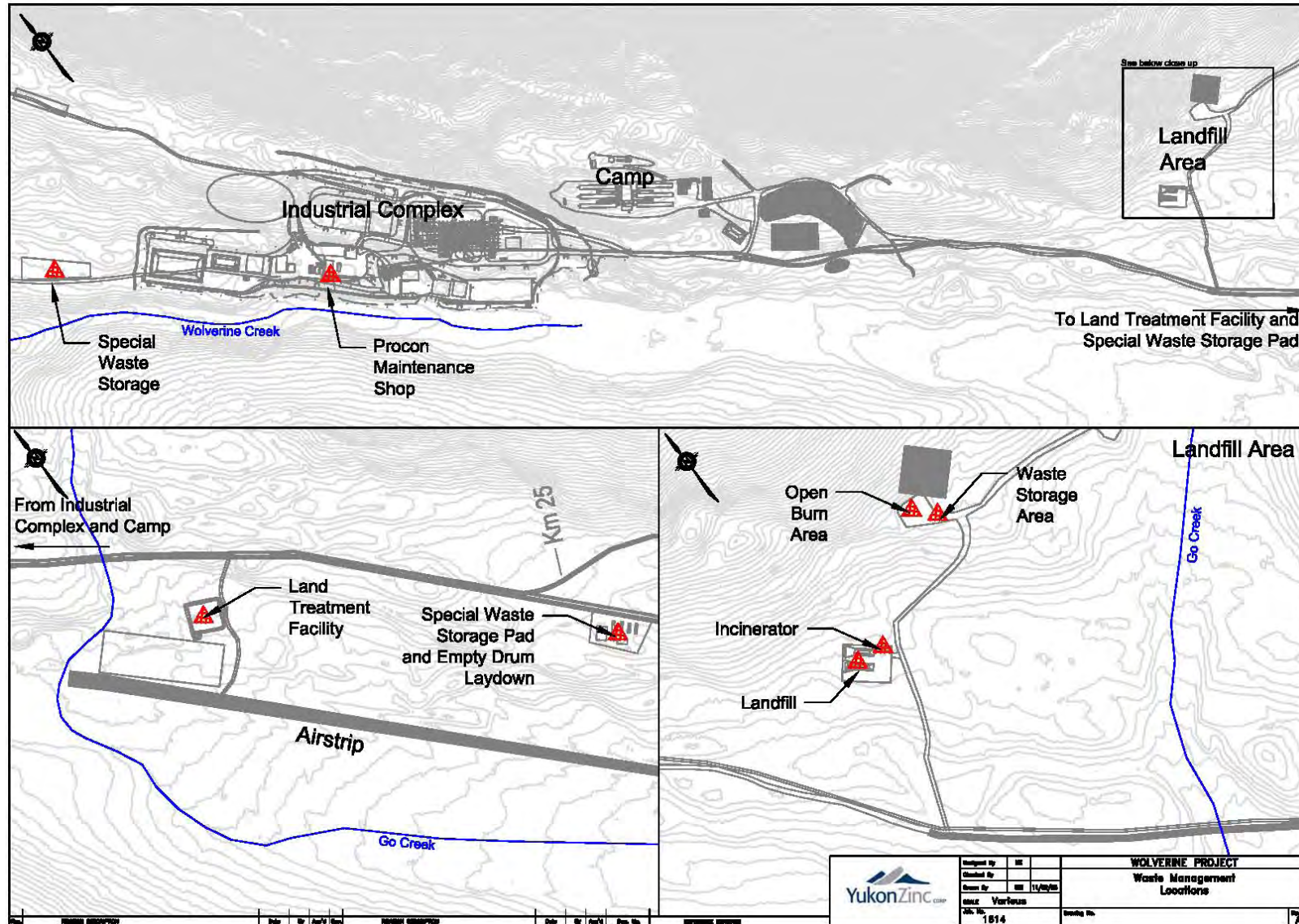


Figure 2-1: Location of Special Waste Storage Area, Landfill and Incinerator, and Waste Storage and Open Burn Area

2.1.2 Incinerator

A Westland Dual Chamber Incineration System, Model #CY-100-CA-D-O, is located within the fenced Landfill Area (Picture 2-6). Adjacent to the incinerator is an ash bin, where ash from the incinerator is transferred prior to disposal in the landfill.



Picture 2-6: Incinerator (centre right) and ash storage bin (centre left) sitting on cement slab.

2.1.3 Waste Storage and Open Burn Area

The waste storage and open burn area is located upslope of the Landfill Area. The waste storage area (Picture 2-7) stores all recyclable and potentially re-usable items that will ultimately be shipped off-site. Signs delineate the segregated piles, which include steel, tires, wood wastes and plastics. The open burn area is shown in Picture 2-8.



Picture 2-7: Sign showing direction of steel and wood piles with steel pile in background.



Picture 2-8: Open burn area.

2.2 Camp and Industrial Complex

The camp waste infrastructure serves the kitchen, office complex, dormitories and site vehicle parking lot. Bear-proof containers are located behind the kitchen facilities and in front of the office complex. Recycling bins for refundable beverage containers and aerosol container bins are located in the recreation hall, kitchen and all offices and dormitories. Used alkaline battery bins are located in the kitchen facilities, Administration Office, and the Environmental Office, all located at the Camp.

The Industrial Complex waste infrastructure serves the Portal (i.e., Procon Mining Office complex), the Crusher, the Mill, the Truck Shop and the Assay Lab. This infrastructure includes bear-proof general waste containers, recycling bins, aerosol bins, and bins for storing used alkaline batteries.

2.3 Special Waste Storage Pad

The Special Waste Storage Pad is located east of the industrial complex area at KM 29 (Figure 2-1) and is used for the storage of waste oil and diesel (in 45 gallon drums or tanks) and Class 9 items (such as aerosol containers and used batteries). In 2011, a new Special Waste Storage Pad will be prepared at the old temporary construction camp area (Figure 2-1), after which the current pad will be decommissioned. A used 45 gallon drum storage (laydown) area is currently at this new location.

2.4 Procon Maintenance Shop

The waste oil burner located in the Procon Maintenance Shop (Picture 2-9) burns waste hydrocarbons to generate heat. Waste products consumed by the burner include:

- Crankcase oil;
- Automatic transmission fluid;
- Hydraulic oil; and
- Fuel Oils #2 (truck diesel and heating oil), #4 (blend of diesel, distillate or residual fuel oil) and #5 (residual fuel oils or heavy fuel oils).



Picture 2-9: Waste Oil Burner in Procon Maintenance Shop

2.5 Land Treatment Facility

YZC operates a Multi-Use Land Treatment Facility (LTF) for the purposes of acceptance, storage and treatment of soil and/or water contaminated with 1) petroleum hydrocarbons, 2) ethylene glycol, and 3) other contaminants below the standards for industrial land use. This facility is located east of the airstrip (Figure 2-1), and is permitted by LTF Permit. It has delineated remediation areas for ethylene glycol, oil, gas and diesel hydrocarbon contaminated soil and snow, which are identified by signs (Picture 2-10). As material is remediated (i.e., meets *Yukon Contaminated Sites Regulations Numerical Soil Standards for Industrial Land Use*), it is removed from the facility for use in industrial activities, following approval from Yukon Environment.



Picture 2-10: LTF with signs that delineate the locations of different types of contaminated material.

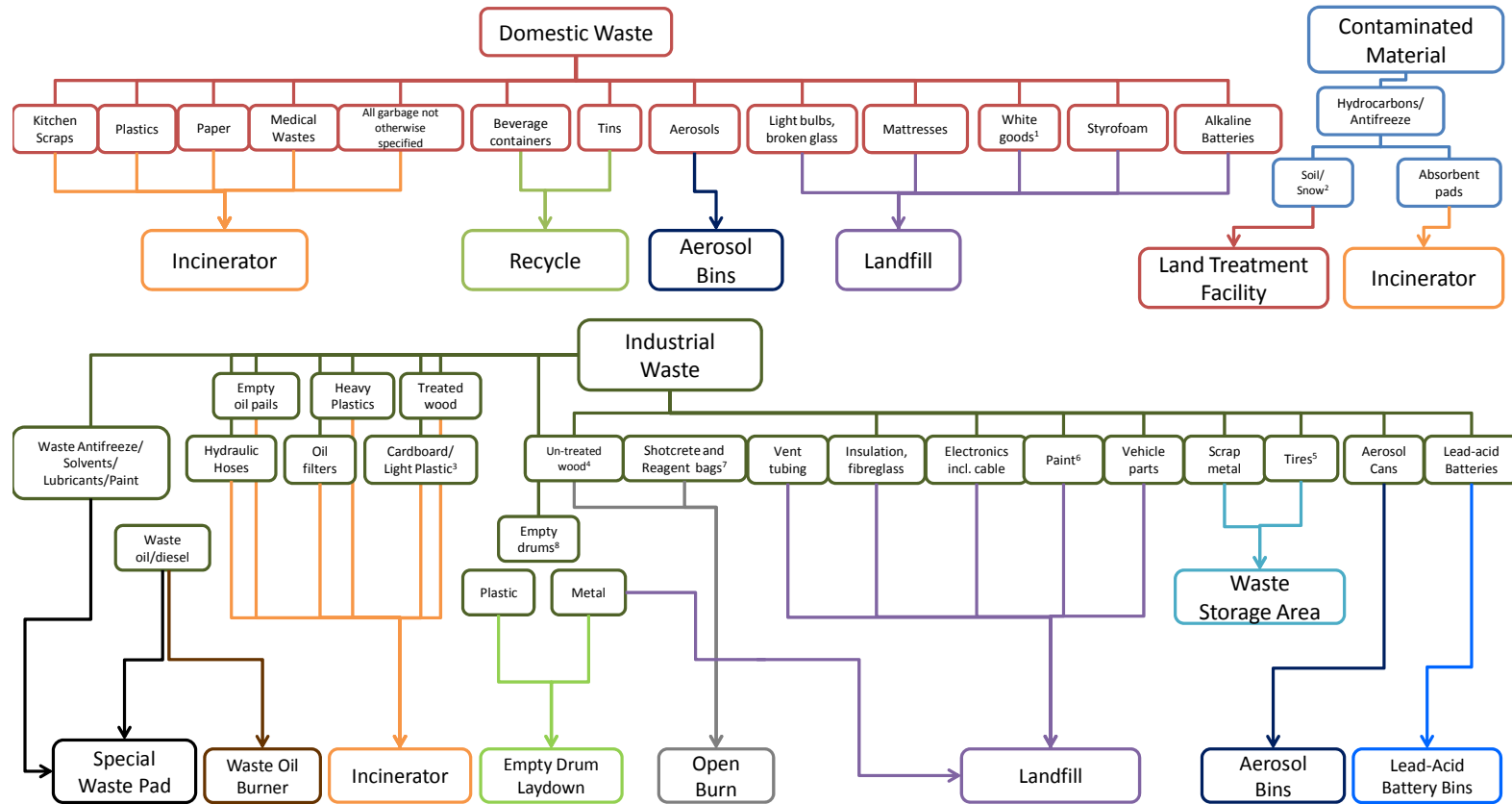
3 Solid Waste Management

This section outlines how solid wastes are handled, stored and disposed of. Non-hazardous solid waste is segregated into putrescible and non-putrescible wastes. Non-putrescible waste is further segregated into recyclable, burnable and non-burnable material. Table 3-1 outlines the handling and storage of solid waste and Figure 3-1 summarizes the disposal requirements for the wastes generated by the Mine.

Table 3-1: Handling, Storage and Disposal of Solid Waste

Type	On-site Storage Location	Disposal
Kitchen Waste	Bear-proof containers	Incinerate
Beverage Containers	Recycling Bins	Off-site disposal
Office and Dormitory Garbage	Garbage Bins/Bear-proof containers	Incinerate
Untreated Wood; Paper, Plywood & Particle Board	Open Burn Area	Open burn
Treated Wood	Waste Storage Area	Incinerate
Heavy Plastics	Waste Storage Area	Landfill/Incinerator ¹
Light Plastics/Construction Debris	Waste Storage Area	Open burn ² /Incinerator
Steel	Waste Storage Area	Off-site Disposal facility
Oil Drums (empty)	Empty drum laydown	Off-site disposal
Reagent Drums (empty)	Empty drum laydown	Landfill/Off-site disposal ³
Used reagent and shotcrete bags	Open Burn Area	Open burn ⁴ /Incinerator
Ash from Incinerator/Open burn area	Ash Bin	Landfill
Tires (rim size < 24" diameter)	Waste Storage Area	Barrier use or off-site disposal facility
Tires (rim size > 24" diameter)	Waste Storage Area	Barrier use or land filled
Alkaline batteries	Battery bins (Camp kitchen and Admin/Environmental Offices)	Landfill

1. Heavy plastics will be incinerated when safe to do so, or else will be put in landfill
2. Light plastics intermixed with construction debris may be open burned but materials should be separated as much as possible prior to burning
3. Empty reagent drums must be rinsed prior to being crushed and landfilled or sent off site for recycling
4. Empty reagent bags must be rinsed prior to incineration. If unable to incinerate safely, bags can be open-burned.



Notes:

1. Fluids (coolants, refrigerants, etc) will be drained from appliances and properly processed prior to transfer to the landfill
2. Samples will be collected by the Environmental Department prior to disposal
3. Cardboard and Light Plastics may be opened burned if mixed in with construction wastes
4. Untreated wood (including brush) open burning volumes are not limited
5. Tires with rim size >24.5" can be buried, all smaller tires may be stored at the waste storage area (for use as vehicle barriers, portal plug, etc.)
6. Paint must be hardened to be disposed of in the landfill; otherwise paint is stored at the special waste storage pad prior to shipment offsite
7. Reagent bags must be rinsed prior to burning, bags can be open burned only when it is unsafe to incinerate.
8. All reagent drums must be rinsed prior to shipping off site or crushing and landfilling

Figure 3-1: Solid and Special Waste Storage and Disposal Requirements

The following sections outline disposal procedures of solid waste, as Environment Act Permit requirements. Approval from Yukon Environment must be obtained prior to any change in waste disposal methods.

3.1 Recyclable Material

Recyclables must be washed to minimize wildlife attractants before storing. Refundable recyclable materials include:

- Aluminum and tin pop/juice cans
- Plastic beverage containers
- Glass beverage containers
- Tetra packs
- Waxed cardboard juice containers

These items will be stored in designated recycling bins until they are transported off-site for donation to a local charity for refund.

3.2 Burial of Solid Waste

Burial of solid waste in the landfill will be conducted by a trained YZC employee following these procedures:

- Cover any exposed solid waste in a cell with cover material to a depth of 0.1 metres to prevent windblown solid waste and attraction of birds after every 0.5 metres of solid waste is deposited. This procedure may not be possible between November 15 and April 15 if cover material cannot be reasonably obtained.
- Dispose of ash (from incinerator or open burning) by:
 - a) Placing it in a cell and following the cover procedures outlined above; or
 - b) Placing it in a covered metal container suitable for transporting it to a permitted solid waste disposal facility.
- Divert surface water run-off away from the landfill.
- Approval of all data analysis of any contaminated material must be obtained from the Yukon Environment Branch prior to deposition into a cell.
- Deposition of special wastes or materials containing contaminated material containing contaminants in excess of the industrial land use standards in the *Contaminated Sites Regulation* into a cell is prohibited (see Section 4 Special Waste Management)

3.3 Incineration

The incinerator is permitted to incinerate solid waste generated on site, including putrescible waste, domestic waste, hydrocarbon-contaminated absorbent pads, and industrial wastes. The maximum solid waste that may be incinerated is 99 kg per day.

Office and dormitory garbage bins will be emptied daily by cleaning staff and transferred to bear-proof containers located behind the kitchen and in front of the offices. Putrescible waste from the

camp kitchen facilities will be placed into the bear-proof containers by kitchen staff. The Site Services Department will collect and transport garbage from these bear-proof containers twice daily for incineration to minimize wildlife attraction. Putrescible waste will not be stored for a period of greater than seven days prior to incineration.

The incinerator will be inspected and maintained by the Site Services Department, and all maintenance activities will be logged.

The incinerator operator will be a trained YZC employee, familiar with the incinerator operating manual, and will follow these procedures:

- Ensure that the integral components of the incinerator including the burners, gauges, valves, lines, walls, doors and exhaust components, are maintained in accordance with the manufacturer's specifications and in such a manner as to provide optimum control of contaminant emissions during all operating periods.
- Ensure the all material is completely reduced to ash when incinerated.
- Drip dry/wring out hydrocarbon-contaminated absorbent pads (into an appropriate container) to ensure that no hydrocarbons are leaking from the pads when they are loaded into the incinerator.
- Complete the Incinerator Log and Incinerator Pre-Operational Check sheets (Appendix B) for any incineration activities. The Incinerator Log sheets will be provided to the Environmental Department weekly. The Incinerator Pre-Operational Check sheets will be provided to the Site Services Supervisor.

Approval from Yukon Environment is required prior to:

- Incinerating any type of waste that is not identified above;
- Any change to existing incineration equipment, including the addition, removal or replacement of any equipment; or
- Any change in location of the incineration equipment.

3.4 Open Burning

Open burning will be conducted by a trained YZC employee who will follow these procedures:

- Open burning of solid waste generated on site is only permitted until December 31, 2011.
- The maximum mass of solid waste that will be open burned is 49 kg per day (excluding untreated brush or wood products). Approval from Yukon Environment must be obtained prior to open burning greater than 49 kg of solid waste per day.
- Ensure a natural or artificially induced draft is present when solid waste is burned, that all material is completely reduced to ash and that no combustibles are allowed to smolder (burn and smoke without flame).
- Divert surface water run-off from the active burning area.
- Do not use waste petroleum products to assist with open burning of solid waste.
- Other than waste plywood and particle board, do not open burn treated wood products including but not limited to wood products that have been treated with creosote, chromium copper arsenate [CCA], pentachlorophenol [PCP] or any type of paint.

- Open burn waste reagent bags and shotcrete bags as incinerating them poses some risk to incinerator operator safety. Rinse reagent bags thoroughly before incineration.

3.5 Used Tires

Used tires will be collected and stored at the waste storage area. Tires not used for the purpose of protection barriers or other on-site uses will be hauled off-site and disposed of in accordance with the Yukon Used Tire Management Program². Tires will be kept reasonably clean and not buried or burned, with the exception of tires with rim size greater than 24.5", which are buried at the landfill.

4 Special Waste Management

This section outlines the handling, storage and disposal of special wastes. Special wastes include waste oil, waste oil filters, waste diesel, waste anti-freeze, hydrocarbon/antifreeze contaminated adsorbent material (absorbent pads, snow and soil), waste solvents and lubricants (and containers in which they are contained), used aerosol containers, used hydraulic hoses, used lead-acid batteries, medical wastes, and some waste mill reagents. Figure 3-1 summarizes the special waste storage and disposal requirements for the Mine and Table 4-1 outlines the storage and disposal of special waste.

Table 4-1: Storage and Disposal of Special Waste

Type	On-site Storage Location	Disposal
Waste oil	Special Waste Storage Pad	Off-site disposal facility
	Procon Maintenance Shop	Waste Oil Burner
Waste oil filters and hydraulic hoses	Special Waste Storage Pad	Incinerator
Waste diesel	Special Waste Storage Pad	Off-site disposal facility
	Procon Maintenance Shop	Waste Oil Burner
Waste antifreeze	Special Waste Storage Pad	Off-site disposal facility
Waste solvents/lubricants	Special Waste Storage Pad	Off-site disposal facility
Hydrocarbon/antifreeze contaminated adsorbent pads	Clean up from spills	Incinerator
Hydrocarbon/antifreeze contaminated snow/soil	Clean up from spills	Land Treatment Facility
Used aerosol containers	Class 9 bins – Special Waste Storage Pad	Puncture and incinerate
	Class 9 bins – Landfill Area	
Used lead-acid batteries	Battery bins (Procon Maintenance Shop/Special Waste Storage Pad/Landfill Area)	Off-site disposal facility
Medical wastes	Medical waste containers (Mining and Medic offices)	Incinerator
Waste Mill Reagents	Special Waste Pad	Off-site disposal facility
		Tailings waste stream

² <http://www.environmentyukon.gov.yk.ca/pdf/dmrone.pdf>

YZC will handle and store special waste separately from solid waste to the extent practicable, and in the following manner to prevent endangering human and wildlife health and the environment:

- Waste oil from piston aircraft will not be mixed with other waste oil.
- Special waste will not be mixed with any other material unless authorized by the Yukon Environment Branch as an acceptable treatment/disposal option.
- All drums, and any other portable containers containing special wastes, will be covered to prevent container degradation from the sun or contamination by water from snow or rain. They will also be stored off the ground to prevent container degradation by ground moisture.
- Incompatible substances will be stored separately to prevent contamination, fires, explosions, gaseous emissions, leaching or other discharges, or other dangerous conditions. Refer to the Material Safety Data Sheets (MSDS) for more information. Master copy MSDS binders for all hazardous substances are available at the Environmental, Security and Medic offices and where products are used and stored. MSDS copies for area specific hazardous substances are located in the Mill, the Procon Maintenance Shop and the Assay lab. Special waste MSDS are provided in Appendix C.
- The contents of all storage containers will be clearly marked. Containers used for storage of special waste will be made of materials that will not adversely react with the special waste.
- The residue at the bottom of any container used for the storage of special wastes will not be drained to the environment. Such residue will be segregated and treated as a special waste until proven otherwise.
- During storage or transport of any special waste, the container will be closed at all times and will not be opened, handled or stored in a manner which may cause it to leak. Any special waste stored in leaking containers will be immediately removed or transferred to intact containers.
- Every closed container that
 - i. has a capacity of more than 230 litres;
 - ii. is designed to be installed in a fixed location; and
 - iii. will contain special wastewill be certified by a testing agency recognized by the Standards Council of Canada prior to putting special waste in the container.

Stored special waste will be shipped off-site to an acceptable disposal or recycling facility and YZC will participate in Environment Yukon's annual commercial special waste collection, occurring in late summer/early fall, as appropriate³.

YZC will transport and transport special waste in the following manner:

- No special wastes will be transported by YZC other than within the Mine site.
- All special wastes transported off-site will be in accordance with applicable transport laws, to a facility permitted in the Yukon or other jurisdiction to receive them, by a carrier permitted in the Yukon or another jurisdiction to receive and transport special wastes. If the facility is in the Yukon, both the facility and the carrier must be permitted in the Yukon according to the *Transportation of Dangerous Goods Regulations (SOR/2008-34)*.

³ <http://www.environmentyukon.gov.yk.ca/monitoringenvironment/specialwastecollection.php>

- A movement control document (manifest) will be completed to document each shipment of special waste (including volume), as per *TDG Regulations* noted above.
- All special wastes will be transported and transferred in such a manner as to prevent their release into the environment.
- All vehicles carrying any special waste will be secured to prevent access to unauthorized personnel.

4.1 Waste Oil and Filters

The major sources of waste oil are from mobile equipment and power plant generators. The most common types of used oil are crank case oil, gear oil, transmission fluid, and hydraulic oil.

Waste oil will be handled in two ways: by collection and disposal of via incineration in the Waste Oil Burner (located in the Procon Maintenance Shop) for the purpose of space heating, or stored at the Special Waste Storage Pad and periodically removed from site.

The waste oil incinerated must conform to the *Standards for Acceptable Contaminant Levels in Waste Oil* as shown in Section 10.5 of the Environment Act Permit. The waste oil feedstock will be analyzed if directed by an environmental protection officer to do so. Oil from piston aircraft will not be incinerated, unless analyses are performed and the oil meets the standards noted above.

Waste oil filters and hydraulic hoses will be drained of oil and incinerated. Steps required for proper disposal include puncturing the top of the filter, setting the filter in a tray and allowing the oil to drain for approximately 24 hours before incineration.

Empty oil drums will be drained, and stored at the empty drum laydown (Figure 2-1) prior to being shipped offsite to a designated recycling facility.

4.2 Waste Diesel

Waste diesel will either be stored at the Special Waste Storage Pad and periodically shipped to a disposal facility or temporarily stored at the Procon Maintenance Shop and burned in the Waste Oil Burner.

4.3 Waste Antifreeze

Waste antifreeze will be stored in containers that are leak-free and have tight closures to prevent spills. The containers will be stored at the Special Waste Storage Pad and periodically shipped to a disposal facility.

4.4 Waste Solvents and Lubricants

Small quantities of miscellaneous waste solvents and lubricants will be generated through routine site, equipment, and vehicle maintenance and repairs. Most of these liquids are flammable and toxic. Solvents will be recycled (e.g., paint thinners and strippers, varsols, degreasing fluids, mineral spirits and petroleum distillates) or collected and stored in appropriate drums for regular shipment to a licensed recycle or disposal facility. The latter will be done for lubricants. Containers will be covered to protect them from precipitation and will be kept separate from other waste products.

4.5 Contaminated Snow and Soil

Spills on-site may include hydrocarbons (i.e., diesel, waste oil, and hydraulic oil), antifreeze, solvents and lubricants and other hazardous materials. These items each have specific disposal methods:

- Hydrocarbon and antifreeze contaminated soil and snow will be excavated and transported to the LTF – samples will be taken by the Environmental Department to ensure compliance with the LTF Permit.
- Hydrocarbon and antifreeze contaminated absorbent pads will be incinerated.
- Solvents and lubricants have specific disposal requirements as per the MSDS provided in Appendix C.

For further information, please refer to YZC's Spill Contingency Plan V2010-03.

4.6 Used Aerosol Containers

Used aerosol containers will be stored in leak proof bins located at the Procon Maintenance Shop, Special Waste Storage Pad, and landfill. These containers will be punctured before incineration to release their pressure and remaining contents. The scrap metal resulting from the incineration will be disposed of in the landfill.

4.7 Used Lead-Acid Batteries

Lead-acid batteries from vehicles and heavy equipment will be stored in designated leak proof bins or on lined wooden pallets, located at the Procon Maintenance Shop, Landfill Area, and the Special Waste Storage Pad, and periodically shipped to a licensed recycle or disposal facility. The following steps must be adhered to in order to prevent acid leaks and spills, and to avoid contamination of the storage site:

- Batteries will be placed on wooden pallets in secondary containment (i.e., on a liner or berm) to prevent the escape of acid.
- Before putting waste batteries on the pallet, plastic sheeting will be placed on it to completely enclose all of the batteries in a continuous sheet of plastic. All sides will be wrapped to protect the batteries from the weather and to prevent any acid from being discharged into the environment.
- Batteries will not be stacked more than three layers thick and each layer will be separated with a sheet of plywood or other suitable material.

4.8 Medical Waste

A small amount of medical waste (such as bandages) will be generated at the first aid rooms at the Mining and Medic Offices. This waste will be collected in designated purpose-built containers, and then transported by the Site Services Department to the landfill for incineration.

4.9 Waste Mill Reagents and Containers

Figure 4-1 outlines the management of waste reagent containers generated by the mill.

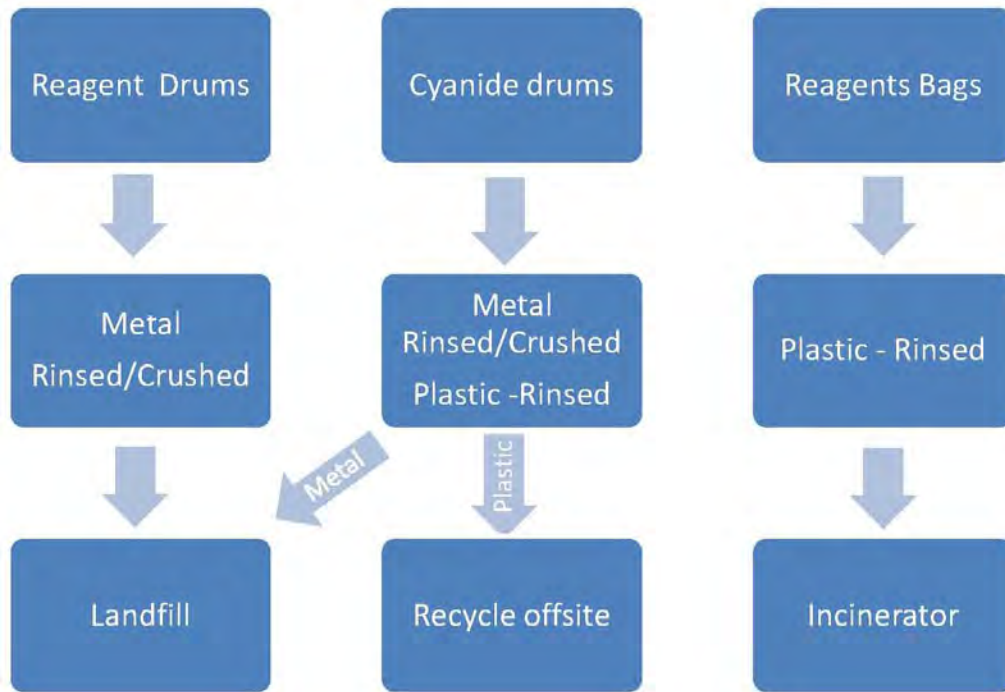


Figure 4-1: Mill Waste Reagent Container Disposal Methods

5 Inspections and Record Keeping

Regular inspections and record keeping will be conducted as per Environment Act Permit requirements, as outlined in Table 5-1 and Table 5-2, respectively.

Table 5-1: Inspection Requirements

Inspection Item	Requirement	Frequency
Electric Fence at Landfill Area	<ul style="list-style-type: none"> The fence is sufficiently charged to deter wildlife; and There is no vegetation or windblown litter or other items along the perimeter of the fence, that may act as ground 	Weekly (during period of activation)
Waste Storage Areas	Verify correct segregation of wastes and mitigate accordingly	Weekly
Incinerator and Waste Oil Burner	Visual inspection and maintenance on all incinerator components, and tanks, and piping supplying fuel to the incinerator	Monthly
Surface Water Runoff at Landfill Area	Qualitative observations regarding flow rate, general flow direction, and any noticeable affects the run-off is having on the facility	Spring melt, or as required by Environmental Protection Officer

Table 5-2: Record Keeping Requirements

Records ¹	Requirement	Frequency
Copy of Plans	Each plan developed under the permit, and any amendments to and approvals (if applicable) of each plan	As appropriate
All Inspections	<p>Include: Name, date, observations, actions taken, date of each action:</p> <ul style="list-style-type: none"> • Repair the damage or take other actions as required to bring site into compliance. • List any and all deficiencies remedied above and how and when they were remedied. 	Each inspection
Incinerator stack tests	Test results	As Required
Spills or Leaks	Include: substance involved, estimated quantity, date of observation, and cleanup procedures implemented	As required (see Spill Contingency Plan V2010-3)
Detailed Landfill Area Site Plan	Locations of all active and closed cells and segregation areas.	Updated as required
Incinerator Operation	<p>Daily Log:</p> <ul style="list-style-type: none"> • Name of operator monitoring each burn; • Dates, times and length of operation of the incinerator of the incinerator each burn; • Content of each load (type, mix and mass); • Volumes and location of ash disposed; and • All maintenance activities, including dates and results of visual inspections and regular maintenance on all incinerator components and tanks and piping supply fuel to the incinerator. 	Daily (see Appendix B)
Incinerator Malfunction	<p>In the event of an incinerator malfunction, a record must be made of the following:</p> <ul style="list-style-type: none"> • Dates times and length of any emergency shutdown and/or malfunction; • Volumes and location of ash disposed of; and • The log entry date and name of person entering information. 	As required
Special Waste	<ul style="list-style-type: none"> • Estimated volumes of each type of special waste and their storage locations; • Inspections noted above for special waste; • Results of all required waste oil feedstock samples (as directed by an Environmental Protection Officer); • Name of any company that transports listed special waste from Mine site; and • A copy of any waste manifests used to transport special waste to or from the Mine site. 	As required

¹ – Records to be kept for a minimum of three years and to be available upon request for inspection by an Environmental Protection Officer

Appendix A: Wolverine Mine Issued Environment Act Permits

- **Environment Act Permit 4201-81-014**
- **Land Treatment Facility Permit 4202-24-022**



Permit No: 4201-81-014

ENVIRONMENT ACT PERMIT

Issued Pursuant to
the *Environment Act*, the *Solid Waste Regulations*, the
Air Emissions Regulations, and the *Special Waste Regulations*

Permittee: Yukon Zinc Corporation

Mailing Address: 701-475 Howe Street, Vancouver, BC, V6C 2B3

Site Location: Wolverine Mine, 280 km northeast of Whitehorse, 130°07'W, 61°25'N

Phone/Fax: (604) 682-5474 ext 246 / (604) 682-5404 (Vancouver office)
(604) 678-4948 ext 2 / (604) 639-5703 (Wolverine office)

Authorized Representative: Pamela O'Hara **Email:** pohara@yukonzinc.com


Effective Date: Date of Director's Signature

Expiry Date: December 31, 2011

This permit replaces permit #4201-81-014 issued 29 March 2010, permit #4201-60-021 issued 18 January 2010, and permit #4201-43-046 issued 16 December 2009.

- Scope of Authorization:** In accordance with your application, you are authorized to:
- operate a dump for the disposal of solid waste generated by commercial activities or enterprises;
 - open burn solid waste in an amount greater than 5 kilograms per day;
 - operate an incinerator capable of burning, according to the manufacturer's specifications, more than 5 kg of solid waste per day, antifreeze-contaminated soil, and biosolids;
 - generate, store, or otherwise handle waste oil, waste diesel, waste batteries, and waste antifreeze; and
 - operate equipment for the incineration of special waste (waste oil and waste diesel),
at the above site location (the "site"), as set out in the terms and conditions of this permit.

Dated this 17 day of JANUARY, 2011



Director, Environmental Programs Branch
Environment Yukon

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ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original

Date: 25 JAN 2011 Initials: BP

1. DEFINITIONS

1. In this permit,

“Act” means the *Environment Act*, R.S.Y. 2002, c. 76;

“approved plan” means a plan that is submitted by the permittee and approved by an environmental protection analyst under this permit and includes any terms and conditions specified by the environmental protection analyst in the approval;

“associated personnel” means all employees, contractors and volunteers involved in the permitted activities;

“Branch” means the Environmental Programs Branch, Environment Yukon;

“cell” means a discrete area of a solid waste facility or dump into which solid waste is deposited for permanent disposal and includes such areas that are no longer used for that purpose;

“contaminated material” means any soil, snow, sediment, or water that has one or more parameters in excess of applicable standards in the *Contaminated Sites Regulation*;

“dangerous wildlife” means wildlife so defined in the *Wildlife Act*, R.S.Y. 2002, c. 229;

“disposal areas” means the locations of the solid waste pit, the garbage/biosolids/soil incinerator, and the waste oil incinerator;

“listed special waste” means waste oil, waste diesel, waste batteries, and waste antifreeze;

“open burning” means the combustion of material without control of the combustion air and without a stack or chimney to vent the emitted products of combustion to the atmosphere;

“Regulations” means the *Air Emissions Regulations*, O.I.C. 1998/207, the *Spills Regulations*, O.I.C. 1996-193, the *Solid Waste Regulations*, O.I.C. 2000/11, the *Contaminated Sites Regulation*, O.I.C. 2002/171, and the *Special Waste Regulations*, O.I.C. 1995/047;

“site office” means the office of the permittee located in Yukon;

“solid waste” includes waste which originates from residential, commercial, industrial or institutional sources, from the demolition or construction of buildings or other structures or is specified in a solid waste management plan to be solid waste and for greater certainty includes litter, as defined in the *Act*, but does not include untreated brush or wood products that are not mixed with other materials;

“spill” means a spill in excess of the amounts specified in Schedule A of the *Spills Regulations*;

“vehicle” has the same meaning as in the *Motor Vehicles Act*, R.S.Y. 2002, c. 153; and

“waste manifest” means the shipping document required to be completed by the permittee as set out in this permit in the form approved by an environmental protection analyst.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
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Date: 25 JAN 2011 Initials: SP

2. Any term not defined in this permit that is defined in the Act or the Regulations has the same meaning as in the Act or the Regulations.

2. GENERAL

1. The permittee shall ensure that all associated personnel:
 - a) have access to a copy of this permit;
 - b) are knowledgeable of the terms and conditions of this permit; and
 - c) receive the appropriate training for the purposes of carrying out the requirements of this permit.
2. The permittee shall provide notice in writing to an environmental protection analyst from the Branch prior to any significant change of circumstances at the site, including without limitation:
 - a) discontinuation of or any change to any regulated activity at the site;
 - b) change of ownership of the site; or
 - c) change to the mailing address or phone number of the permittee.
3. The permittee shall obtain approval from an environmental protection analyst from the Branch **prior** to:
 - a) incinerating any type of waste that is not identified in this permit;
 - b) any change to existing incineration equipment, including the addition, removal or replacement of equipment;
 - c) any change in location of the incineration equipment;
 - d) any change in waste disposal methods; and
 - e) an increase in the quantity of solid waste open burned to greater than 49 kg/day.
4. Where conflicts exist between this permit, the permit application or any plans, this permit shall prevail.
5. If an inspection reveals that the site is in any way not in compliance with this permit or approved plans, the permittee shall repair the damage or take other actions as required to bring the site into compliance.

3. PLANS

1. The permittee shall develop and maintain the following plans:
 - a) a fire safety/emergency plan which includes notification procedures and a list of emergency phone numbers relevant to the site; and
 - b) a spill response plan for the site.
2. All associated personnel involved with the handling or management of any wastes covered by the this permit shall be familiar with the plans listed in paragraph 3.1 above.
3. Prior to undertaking any work toward the partial or full closure of a cell, including progressive capping and reclamation of inactive cells, the permittee shall submit a cell closure plan.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
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Date: 25 JAN 2011 Initials: BP

4. No later than six months prior to the planned closure of the dump, the permittee shall submit a dump closure plan for approval.
5. The permittee shall submit to an environmental protection analyst from the Branch for approval, by June 1, 2011, a pollution prevention plan which includes, but is not limited to, the following:
 - a) a detailed assessment of current waste disposal practices, including types of waste generated, the approximate mass of each waste type incinerated, and current waste handling procedures; and
 - b) steps that will be taken to reduce toxic emissions from the incinerator (for example, development of a waste management strategy, installation of emissions controls, equipment upgrades, etc.).
6. The permittee shall implement the approved pollution prevention plan within 3 months of approval.
7. When the permittee is required to submit a plan under this permit, the permittee shall:
 - a) ensure the plan meets the requirements for that type of plan as directed by an environmental protection analyst from the Branch in writing;
 - b) submit the plan in writing to an environmental protection analyst from the Branch;
 - c) not undertake any of the activities described in the plan until the plan is approved in writing by an environmental protection analyst from the Branch; and
 - d) implement the plan as of the date it is approved in writing by an environmental protection analyst from the Branch, or as otherwise directed in this permit.
8. If the permittee wants to amend an approved plan, the permittee shall submit the proposed amendment to an environmental protection analyst from the Branch as if the amendment were a plan under paragraph 3.7 of this permit.
9. If an environmental protection analyst from the Branch directs in writing that an approved plan be amended, the permittee must prepare the required amendment by the date specified and submit it as if it were a plan referred to in paragraph 3.7 of this permit.
10. The permittee shall permanently retain at the site office an updated site plan showing the location of the waste oil incinerator, garbage/biosolids/soil incinerator, the open burn area, and the active and closed cells (if applicable), and shall produce this site plan upon request for inspection by an environmental protection officer.

4. FENCING AND SECURITY

1. The permittee shall install and maintain, in accordance with the manufacturer's operating and maintenance instructions and recommendations, an electric exclusion fence(s) and gates that encompass all putrescible waste storage and disposal areas at the dump and any other areas of the site that become or may become an attractant to animals. The fence and gates shall be adequate to prevent dangerous wildlife from entering the encompassed areas of the site.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
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Date: 25 JAN 2011 Initials: BP

2. The fences and gates referenced in paragraph 4.1 above must be:
 - a) activated continuously from May 1 to October 31 of each year;
 - b) activated between November 1 and April 30 of each year if there are tracks or other signs of dangerous wildlife attempting to access the dump; and
 - c) activated upon the written request of an environmental protection officer.
3. The permittee shall obtain written approval from an environmental protection officer prior to deactivating or failing to activate the electric fence for any reason and for any length of time during the periods referenced in paragraph 4.2 above.
4. The permittee shall ensure that all gates are closed and secured every time personnel leave the area bounded by the electric fence.
5. The permittee shall install and maintain fencing or other comparable measures to prevent the release of solid waste from the dump.

5. STORAGE OF SOLID WASTE

1. The permittee shall ensure that putrescible solid wastes are stored in bear-proof containers and that they are not stored for a period of greater than seven days prior to being transferred off-site, buried in a cell, open burned, or incinerated in accordance with this permit.
2. The permittee shall ensure that tires with a rim size of 24.5" or less are kept reasonably clean and not buried or burned, and that they are taken periodically to a municipal or community dump or other permitted tire depot.

6. BURIAL OF SOLID WASTE

1. The permittee shall ensure that the base of each cell is no closer than three metres above the highest observed groundwater level.
2. The permittee shall ensure that any new cell is located at least 100m from the high-water mark of any water body.
3. The permittee shall cover any exposed solid waste in a cell with soil or other comparable material to a depth of 0.1 metres or any other depth that an environmental protection officer considers necessary to prevent windblown solid waste and attraction of birds after every 0.5 metres of solid waste is deposited.
4. Ash from incinerating or open-burning solid waste is considered to be solid waste and shall be disposed of by:
 - a) placing it in a cell on-site and immediately covering it with a layer of soil or other comparable material to a depth of 0.1 metres, or any other depth that an environmental protection officer considers necessary to prevent windblown ash or attraction of wildlife; or

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 25 JAN 2011 Initials: BP.....

- b) placing it in a covered metal container suitable for transporting it to a permitted solid waste disposal facility.
- 5. Paragraphs 6.3 and 6.4(a) do not apply between November 15 and April 15 of each year if soil or other comparable cover material cannot reasonably be obtained.
- 6. The permittee shall submit to an environmental protection analyst from the Branch for approval all data analysis of any contaminated material before depositing it into a cell.
- 7. The permittee shall not allow special wastes or materials containing contaminants in excess of the industrial land use standards in the Contaminated Sites Regulation to be deposited into a cell.
- 8. The permittee may dispose of tires with a rim size of greater than 24.5" by burial in a cell.
- 9. The permittee shall divert excess surface water run-off away from any area of the dump where waste is deposited into cells.

7. INCINERATION OF SOLID WASTE

- 1. The permittee shall only incinerate solid waste in the following incinerator, and shall do so in accordance with the manufacturer's specifications and operating & maintenance manuals:
 - a) Westland Dual Chamber Incinerator System, Model #CY-100-CA-D-O
 - 2. The permittee shall only use the incinerator for the incineration of solid waste generated on site, including kitchen garbage, domestic waste, hydrocarbon-contaminated absorbent pads, industrial wastes, biosolids from the onsite sewage treatment plant, and antifreeze-contaminated soil.
 - 3. The maximum mass of solid waste that may be incinerated under this permit is 99 kg per day.
 - 4. Within one year of the implementation date, the permittee shall conduct one of the following measures to demonstrate the effectiveness of the pollution prevention plan:
 - a) Audit of the waste diversion program that has been implemented to reduce the amount of waste being incinerated; or
 - b) Pollution control upgrading; or
 - c) One-time stack test to determine the level of particulate matter, dioxins/furans and mercury in the emissions from the source; or
 - d) Other measures as directed by an environmental protection officer from the Branch.
 - 5. The permittee shall ensure that the integral physical components of the incinerator, including the burners, gauges, valves, lines, monitoring equipment (if applicable), walls, doors and exhaust components, are maintained in accordance with the manufacturer's
- DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 25. JAN 2011 Initials: BP

specifications and in such a manner as to provide optimum control of air contaminant emissions during all operating periods.

6. The permittee shall ensure that the initial start-up of the incinerator does not take place during periods of thermal inversion, so that smoke from such burning will not accumulate in populated areas.
7. The permittee shall ensure that all material when incinerated, is completely reduced to ash.
8. Prior to incinerating hydrocarbon-contaminated absorbent pads, the permittee shall drip them dry and/or wring them out to ensure that no hydrocarbons are leaking from the pads when they are loaded into the incinerator.
9. Prior to incinerating antifreeze-contaminated soil, the permittee must ensure that samples are analyzed for total metals, and must submit the results to an environmental protection analyst from the Branch for approval. Antifreeze-contaminated soil not meeting the Standards for Allowable Contaminant Levels (as shown in Table 1 of this permit) must be disposed of by another method.
10. The permittee shall have a sample of any batch of antifreeze-contaminated soil analyzed as directed by an environmental protection officer, and shall allow an environmental protection officer to obtain a sample of the contaminated soil for the purpose of submitting it for analysis.
11. Results of all analyses performed in accordance with this permit must be submitted to an environmental protection analyst from the Branch by the date specified in the direction to submit a sample for analysis.
12. All analyses performed in accordance with this section must be acceptable to an environmental protection analyst from the Branch. In particular, the permittee shall ensure that the detection limit of the test method used is lower than the standards set forth in Table 1.

8. OPEN BURNING OF SOLID WASTE

1. The permittee is authorized to open burn solid waste generated on site only until **December 31st, 2011**.
2. The maximum mass of solid waste that may be open burned under this permit is 49 kg per day.
3. The permittee shall ensure that the initial start-up of the burning does not take place during periods of thermal inversion, so that smoke from such burning will not accumulate in populated areas.
4. The permittee shall ensure that all material when burned, is completely reduced to ash.

ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original

Date: 25 Jan 2011 Initials: BP

Date: 25 Jan 2011 Initials: BP

5. The permittee shall ensure that a natural or artificially-induced draft is present when solid waste is to be burned.
6. The permittee shall not allow combustibles to smoulder (burn and smoke without flame).
7. The permittee shall divert excess surface water run-off from the active burning area.
8. The permittee may be authorized to use specific waste petroleum products to assist with the burning of solid waste, as approved in advance in writing by an environmental protection analyst from the Branch.
9. Other than plywood and particle board, the permittee shall not burn treated wood products, including but not limited to wood products that have been treated with creosote, chromium copper arsenate (CCA), pentachlorophenol (PCP), or any type of paint.

9. STORAGE AND HANDLING OF SPECIAL WASTE

1. The permittee shall not handle special wastes other than listed special wastes.
2. The permittee shall not discard, destroy, treat, process, or recycle special wastes, except for mixing or dilution authorized by an environmental protection officer pursuant to paragraph 9.3(k) below, except for the incineration of waste oil, in accordance with paragraph 10 below.
3. The permittee shall:
 - a) cover or store out of inclement weather all drums and other portable containers containing special wastes;
 - b) store all drums and other portable containers containing special wastes off the ground;
 - c) immediately remove all special wastes stored in leaking containers or transfer them to intact containers;
 - d) to the extent practicable, handle and store special wastes separately from solid waste;
 - e) store special wastes in a manner that will prevent incompatible substances from reacting adversely with each other;
 - f) post signs identifying examples of common special wastes with information on appropriate disposal options for those materials or with phone number(s) or website(s) to consult for information on appropriate disposal options, whether or not those materials are collected onsite;
 - g) ensure that all containers used for the storage of special waste are clearly marked to identify what special waste the container is intended to hold;
 - h) ensure that containers used for the storage of special waste are made of materials that will not adversely react with the special waste;
 - i) not allow any residue at the bottom of a container used for the storage of special wastes to be released to the environment. Such residue shall be collected by the

Date: 25 JAN 2011 Initials: SP

- permittee, separated from other waste and treated as a special waste until proven by testing to not be special waste;
- j) not mix waste oil from piston engine aircraft with other waste oil;
 - k) only mix or dilute a special waste with any other material where such mixing or dilution is authorized by an environmental protection officer from the Branch as an acceptable treatment/disposal option for the special waste;
 - l) keep all containers used to store special waste closed at all times during storage and not open, handle or store the container in a manner which may cause it to leak or rupture; and
 - m) have every closed container that
 - (i) has a capacity of more than 230 litres;
 - (ii) is designed to be installed in a fixed location; and
 - (iii) will contain special wastecertified by a testing agency recognized by the Standards Council of Canada prior to putting special waste in the container.

10. INCINERATION OF WASTE OIL

1. Waste oil shall only be disposed of through incineration for the purpose of space heating.
2. Waste oil shall only be incinerated in an appliance which is approved or certified to burn waste oil by the Canadian Standards Association (CSA), Underwriters Laboratory Inc., USA (UL), or Underwriters Laboratory, Canada (ULC), or as otherwise approved by the Government of Yukon, Protective Services Branch.
3. The appliance for incinerating waste oil shall be installed and operated in accordance with **CSA Standard B.140.0-03**, as amended from time to time, and the manufacturer's instructions.
4. The permittee shall have a sample of their waste oil feedstock analyzed as directed by an environmental protection officer, and shall allow an environmental protection officer to obtain samples of their waste oil feedstock for the purpose of submitting them for analysis.
5. When submitting a sample of waste oil feedstock for laboratory analysis the permittee shall ensure that the laboratory uses the methods specified in Table 1 below, or equivalent, as amended from time to time, for each listed substance.

TABLE 1: ACCEPTABLE ANALYSIS METHODS AND CONTAMINANT LEVELS IN WASTE OIL

SUBSTANCE	FOR USE AS FUEL IN WASTE OIL FURNACES ppm	ACCEPTABLE EPA METHOD
Arsenic	5	3050/3051 & 7060
Cadmium	2	3050/3051 & 7000/7131
Chromium	10	3050/3051 & 7000/7191

	FOR USE AS FUEL IN WASTE OIL FURNACES	ACCEPTABLE EPA METHOD
Lead	100	3050/3051 & 7000/7421
Total Organic Halogens	1000	9020 or 9022
PCBs	2	3540/3541 & 8082

6. The permittee shall not incinerate any waste oil in which one or more contaminants exceeds the standards specified in Table 1.
7. All analyses performed in accordance with this permit must be acceptable to an environmental protection analyst from the Branch. In particular, the permittee shall ensure that the detection limit of the test method used is lower than the standards set forth in Table 1.
8. Results of all analyses performed in accordance with this permit must be submitted to an environmental protection officer from the Branch by the date specified in the direction to submit a sample for analysis.
9. Prior to blending contaminated waste oil with uncontaminated waste oil, the permittee shall submit analytical results for both the contaminated and uncontaminated oil, as well as a plan for handling and blending the oil in accordance with the Guidelines for Waste Oil Blending, to an environmental protection analyst from the Branch, and shall obtain written authorization to blend the oils.
10. Oil containing levels of PCBs above the limit specified in Table 1 shall not be incinerated or blended with other waste oil.
11. Oil from piston engine aircraft shall be assumed to contain lead contamination in excess of the maximum level specified in Table 1 unless proven otherwise.

11. TRANSPORT AND TRANSFER OF SPECIAL WASTE

1. The permittee shall not transport or transfer special wastes other than within the site.
2. The permittee shall ensure that all listed special wastes are transported and transferred in such a manner as to prevent their release into the environment.
3. The permittee shall ensure that special wastes are transported to a permitted special waste management facility in the Yukon or another jurisdiction by a carrier permitted in the Yukon to receive and transport the special wastes.
4. The permittee shall complete a waste manifest documenting each shipment of special wastes from the site. The permittee shall distribute copies of the waste manifest in the manner described thereon.

DEPARTMENT OF ENVIRONMENT
 ENVIRONMENTAL PROGRAMS
 Whitehorse, Yukon
 Certified true copy of original
 Date: 25 JAN 2011 Initials: BP

5. The permit number **YG81-014** shall be used as the Provincial Identification Number on waste manifests used for the transport of the listed special wastes.
6. The permittee shall ensure that all vehicles operated by the permittee and carrying any special wastes are secured to prevent access by unauthorized persons.

12. SPILLS

1. The permittee shall contact either an environmental protection officer, or the 24-hour Yukon Spill Report Centre (**867-667-7244**) as soon as possible under the circumstances in the event of a release, spill, unauthorized emission, discharge, or escape of any of the listed special wastes.
2. The permittee shall ensure that appropriate clean-up equipment (such as sorbent, shovel, broom, bucket, gloves, boots, etc.) is in a readily available location at all locations where the listed special wastes are handled or stored.
3. The permittee shall ensure that emergency spill procedures are posted at all locations where the listed special wastes are handled or stored, and that all personnel (employees, contractors or volunteers) are familiar with those procedures.

13. INSPECTIONS

1. The permittee shall conduct weekly inspections of all electric fences and shall maintain them as necessary during periods of activation as specified in paragraph 4.2 to ensure that:
 - a) the fence is sufficiently charged to deter wildlife; and
 - b) there is no vegetation or windblown litter or other items along the perimeter of the fence, or contacting the fence, that may act as a ground.
2. The permittee shall conduct weekly visual site inspections to verify the correct segregation of wastes and shall transfer all identified improperly segregated wastes to their appropriate segregation areas.
3. The permittee shall conduct monthly visual inspections and maintenance on all incinerator components, and tanks and piping supplying fuel to the incinerator.
4. The permittee shall ensure that surface water run-off is inspected during spring melt and as required by an environmental protection officer. Such inspections shall include, but not be limited to, qualitative observations regarding flow rate, general flow direction, and any noticeable effects the run-off is having on the dump.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: 25 JAN 2011 Initials: BP

14. RECORDS

1. The permittee shall keep all records required under this permit in a format acceptable to an environmental protection officer for a minimum of three years and make them available for inspection by an environmental protection officer upon request.
2. The permittee shall submit a report to an environmental protection analyst from the Branch describing the effectiveness of the implementation of the pollution prevention plan, including quantifiable data showing the reduction in the amounts and/or types of waste incinerated, pollution control equipment added and the associated reductions in emissions, and the results from emissions testing, as applicable. This report shall be submitted by December 31, 2012.
3. The permittee shall keep the following records at the site office:
 - a) a copy of each plan developed under this permit, and any amendments to and approvals (if applicable) of each plan;
 - b) summaries of all inspections carried out under this permit which include the name of the person conducting the inspection, the date of each inspection, any observations recorded during the inspection, actions taken as a result of those observations, and the date each action was taken;
 - c) results of any incinerator stack tests, if required;
 - d) notes concerning any spills or leaks occurring at the site, including substance involved, estimated quantity, date of observation of the spill or leak, and clean-up procedures implemented;
 - e) the types of special wastes segregated at the site, their estimated volumes, and their storage location(s) at the site;
 - f) any and all deficiencies remedied in accordance with paragraph 2.5, and how and when they were remedied; and
 - g) a copy of any waste manifests used to transport special wastes to or from the site;
 - h) the name of the incinerator operator monitoring each burn;
 - i) the dates, times and length of operation of the incinerator for each burn;
 - j) the types of solid waste incinerated in each batch (eg. Kitchen/putrescibles, cardboard, construction waste, etc.);
 - k) the volumes and location of ash disposed;
 - l) the dates, times and length of any emergency shutdown and/or malfunction of the incinerator(s), and any corrective actions taken;
 - m) the dates and results of visual inspections and monthly maintenance on all incinerator components and tanks and piping supplying fuel to the incinerator;
 - n) the volumes and location of ash disposed; and
 - o) the log entry date and name of the person entering the information.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
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Date: 25 JAN 2011 Initials: BP



Permit No: 4202-24-022

LAND TREATMENT FACILITY PERMIT

Issued for the Operation of a Land Treatment Facility Pursuant to the *Environment Act*
and Part 5 of the *Contaminated Sites Regulation*

Permittee: Yukon Zinc Corporation
Mailing Address: #701-475 Howe Street, Vancouver, BC V6C 2B3
Site Location: Wolverine Project, 280 km E/NE of Whitehorse
(Lat 61°25'N, Long. 130°7'W)
Phone/Fax: (604) 682-5474 / (604) 682-5404

In accordance with your application:

Yukon Zinc Corporation, represented by yourself, is hereby permitted to operate a Multi-Use Land Treatment Facility (a "facility") for the acceptance, storage and treatment of

- soil and water contaminated with petroleum hydrocarbons and soil contaminated with ethylene glycol, including soil also containing other contaminants below the standards for those contaminants for industrial land use; and

hereinafter referred to as contaminated material, subject to the following definitions and conditions:

PART 1. DEFINITIONS

1. In this permit, the following terms shall have the following meanings:
 - a) "Branch" is the Environmental Programs Branch of Environment Yukon;
 - b) "facility" is the entire area of the Land Treatment Facility, including the staging cells, treatment cells and all access roads;
 - c) "treatment cell" is a bermed area into which contaminated material is placed for treatment after analytical results confirm it is suitable for bioremediation; and
 - d) "free-phase petroleum hydrocarbons" are petroleum hydrocarbons that exist in a distinct layer or phase when present with water or other liquid; and are considered to be special waste.

PART 2. GENERAL CONDITIONS

1. The permittee shall comply with applicable requirements in all federal, territorial and municipal legislation.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original

Date: ... JUL 1 9 2010 Initials:

2. Only contaminated material generated by the permittee's own activities may be collected, stored or treated at the facility.
3. The permittee shall ensure that all personnel (employees, contractors or volunteers) involved with the operation of the facility are knowledgeable of the conditions and requirements specified in this permit. A copy of this permit shall be available to all personnel working at the site.
4. The permittee shall ensure that all personnel (employees, contractors or volunteers) working at the facility receive the appropriate training for the purposes of operating the facility, handling contaminated material and carrying out the requirements of this permit.
5. The permittee shall allow an environmental protection officer, at any reasonable time, to enter any place or premise under the permittee's ownership or occupation, other than a private dwelling, and inspect any activity which is subject to this permit.
6. The permittee shall provide notice in writing to the Branch prior to any significant change of circumstances at a permitted operation, site or business, including without limitation:
 - a) closure of the facility;
 - b) a change in the ownership of the facility; or
 - c) a change in the mailing address, site location or phone number of the permittee.
7. The permittee shall ensure that the facility is operated as described in the permit application, accompanying documents, land treatment facility plans and closure plans, except where conflicts exist between such documents and this permit, in which case the permit shall prevail.
8. All sampling must be conducted in accordance with all protocols pursuant to the *Contaminated Sites Regulation* that pertain to sampling and analysis. Sample collection must be carried out by trained personnel using appropriate equipment and procedures.
9. All analytical testing required by this permit must be performed by a laboratory accredited as described in *Protocol 2: Analysis of Samples Taken in Relation to the Contaminated Sites Regulation*.

PART 3. FACILITY CONSTRUCTION

1. The permittee shall not construct or operate a facility on any portion of land where:
 - a) The slope is greater than 6%;
 - b) The seasonal high water table is less than 3 metres below the surface;
 - c) The facility would be within 100 metres of a surface water body;
 - d) The land is identified as being within a 25 year floodplain; or
 - e) Residential property lines or buildings are less than 60 metres away.
2. The permittee shall ensure that a UV-resistant impermeable liner of a minimum 30 mil thickness (30 thousandths of an inch) is placed beneath all treatment cells, installed according to the manufacturer's specifications, and firmly anchored in the berms on all sides of each cell.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
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Date: **JUL 19 2010** Initials:.....

3. In accordance with the permit application and supporting documents:
 - a) the facility shall consist of:
 - i. one treatment cell, with a maximum interior dimension of 50 metres by 55 metres;
 - ii. one treatment cell, with a maximum interior dimension of 35 metres by 55 metres;
 - b) the maximum height of piles of contaminated material within the facility shall be 0.5 metres; and
 - c) the facility shall be contained within the boundaries of the site location.
4. Prior to altering the size or number of cells or the capacity of the facility, the permittee shall apply for and obtain an amendment to this permit from the Branch.
5. The permittee shall construct berms to prevent the escape of contaminated material, runoff or leachate from the cells. The height and permeability of such berms must be sufficient to contain all contaminated material, runoff, and leachate in the cells.
6. Berms surrounding treatment cells shall not be removed or breached except as instructed or approved by an environmental protection officer.
7. The permittee shall construct ramps to allow equipment to access the cells without damaging or degrading the berms or the liner(s).
8. The permittee shall construct diversion berms and/or ditches, as required, to ensure that runoff cannot enter the cells.
9. The permittee shall secure the facility to prevent access by unauthorized persons.
10. The permittee shall post a sign at the entrance to the facility identifying that the facility contains contaminated material.

PART 4. FACILITY MAINTENANCE

1. The permittee shall ensure that:
 - a) the liner, berms, ditches, tanks, fencing, signage, and all other facility components are properly maintained and repaired;
 - b) the facility is inspected every two weeks from April 1 to October 31 of each year; and
 - c) the Branch is notified of any deficiencies at the facility.The permittee shall undertake appropriate remedial action as soon as practicable upon noting any deficiencies, or as directed by an environmental protection officer.
2. The permittee shall take all reasonable measures to ensure that wildlife, including waterfowl, is not attracted to the site. These measures may include, but need not be limited to, fencing, the use of bird scare devices, removal of suitable habitat (e.g. standing water and vegetation), or the installation of netting over the cells.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: JUL 19 2010 Initials:

3. The permittee shall ensure that the contaminated soil in the facility is watered as required to minimize dust, and that dust does not create a hazard or nuisance for site workers or nearby property users.

PART 5. INTAKE OF CONTAMINATED SOIL

1. The permittee shall obtain a permit amendment before collecting, storing or treating materials other than those authorized by this permit.
2. The permittee shall ensure that samples of incoming contaminated material from each source are analyzed for all contaminants of concern, and that the results of those analyses are received, before the material is accepted at the facility.
3. If the permittee has reasonable grounds to believe that incoming contaminated material may contain contaminants other than those authorized by this permit, the permittee shall contact the Branch prior to accepting the contaminated material and shall follow the direction provided by the Branch.
4. The permittee shall not accept contaminated material known or suspected to be special waste without first obtaining a special waste permit.
5. Should analysis of incoming contaminated material show that it contains contaminants other than those authorized by this permit, the permittee shall contact the Branch for direction on the disposal of the material within 5 days of receipt of the analytical results, and shall remove the material from the facility within 30 days of receipt of the analytical results or as directed by the Branch.

PART 6. SOIL HANDLING AND STOCKPILING

1. The permittee shall ensure that contaminated material from different sources or containing different types of contamination is handled, stored and treated separately except as authorized by this permit or as directed by an environmental protection officer.
2. The permittee shall ensure that no contaminated material is mixed with special waste material, treated material or non-contaminated material, except as authorized by this permit or as directed by an environmental protection officer.
3. If contaminated soil is to be treated in layers, the permittee shall ensure that the depth of each layer of contaminated material in the facility is no greater than 0.5 metres and that the total height of all layers within the facility is no greater than the maximum pile height of 0.5 metres, as specified in 3.3(b) above.
4. The permittee shall ensure that contaminated material is handled and stored in a manner that prevents its release into the environment.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original

Date: JUL 19 2010 Initials:.....

5. The permittee shall ensure that deposits of contaminated material within a cell are placed a sufficient distance from all berms to prevent contaminated material, runoff or leachate from escaping the cell.
6. The permittee shall ensure that there is sufficient separation between piles or windrows of contaminated material to allow equipment to access each pile or windrow and to prevent inadvertent mixing of piles or windrows of contaminated material from different sources or containing different levels or types of contamination.
7. The permittee shall ensure that no contaminated material is placed on the ramp(s) into the cells or on access road(s) into or within the facility.

PART 7. MONITORING

1. The permittee shall develop and implement a sampling and monitoring program for all contaminated material being treated at the facility, in accordance with all guidelines and protocols pursuant to the *Contaminated Sites Regulation* that pertain to the sampling, analysis and monitoring of contaminated material within a Land Treatment Facility.
2. The permittee shall ensure that samples of contaminated material from each source are taken and analyzed at least once every three years in order to assess remediation progress.
3. The permittee shall ensure that the pH of the contaminated material is tested whenever other analyses are performed or as otherwise required by the Branch.

PART 8. REMOVAL OF REMEDIATED SOIL

1. The permittee shall not remove any material from the facility without first:
 - a) submitting a written request to the Branch to remove the material;
 - b) providing information on the land use at the receiving site;
 - c) providing analytical results demonstrating that the material to be removed is suitable for use at the receiving site;
 - d) providing the date on which the soil was last tilled;
 - e) receiving the written approval of the Branch for the removal; and
 - f) obtaining a relocation permit for the relocation of the remediated material, if applicable.
2. Prior to taking confirmatory samples from a pile of contaminated soil in support of a request to remove the soil from the facility, the permittee shall till or turn the material at least once using appropriate equipment.
3. The permittee shall ensure that any contaminated material not remediated by the permittee is transported, in accordance with applicable transport laws, to a facility permitted in the Yukon or another jurisdiction to receive the contaminated material.
4. The permittee shall ensure that contaminated material previously identified as containing contaminants other than petroleum hydrocarbons is analyzed again for those contaminants

before the material is removed from the facility, and that the material is suitable for use at the receiving site.

PART 9. MANAGEMENT OF CONTAMINATED WATER

1. The permittee shall ensure that all runoff within cells, including rain water and snow and ice melt, is either contained within the berms of each cell while still leaving a minimum of 30 cm freeboard or is removed from the cells and is contained within the facility in aboveground storage tanks of sufficient volume.
2. All liquid contaminated materials, other than runoff from soil in the facility, shall be stored in aboveground storage tanks equipped with secondary containment or stored within the treatment cell in other suitable containers. All liquid contaminated materials shall be stored in accordance with the National Fire Code requirements for flammable and combustible liquids.
3. Prior to using any contaminated liquid, other than runoff from soil in the facility, to provide moisture to remediating soil, the permittee shall ensure that the liquid is collected in a storage tank, that the liquid does not contain free-phase petroleum hydrocarbons, that a sample is analyzed for total metals and any other contaminants of concern, and that the results do not exceed the applicable special waste criteria.
4. Prior to discharging any contaminated liquid to the environment, including runoff from soil in the facility and liquid that has been treated or filtered, the permittee shall:
 - a. collect a representative sample of the liquid proposed for discharge;
 - b. submit a written request to the Branch to discharge the water;
 - c. provide analytical results demonstrating that hydrocarbons, total metals, and any other contaminants of concern are below applicable *Contaminated Site Regulation* standards.This condition does not apply to liquids applied to remediating soil from within the facility, which are subject to condition 9.3 above.
5. Notwithstanding item 9.4 above, the permittee may remove snow from the facility and discharge it to the environment without sampling, provided that the snow is from an area of the facility where no contaminated soil is present and that the snow has not come into contact with contaminants or contaminated material.
6. The permittee shall ensure that a sample of the contaminated liquid referred to in 9.3 and 9.4 above is collected when no additional material is to be added to the storage tank and shall ensure that no additional material is added to that storage tank between the collection of the sample and the use or disposal of the sampled liquid.
7. Free-phase petroleum hydrocarbons shall be disposed of in accordance with all applicable regulations and shall not be sprayed onto soil in the facility.
8. Any contaminated liquid at the facility found to exceed special waste criteria for any contaminant other than petroleum hydrocarbons shall not be sprayed onto soil in the facility. Such liquid shall be disposed of in accordance with all applicable regulations.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: **JUL 19 2010** Initials:.....

9. On an annual basis, or more often if necessary, the permittee shall monitor the level of solids in each liquid storage tank. The solids shall be removed as necessary to ensure that the tanks do not fill with sediment.
10. The permittee shall ensure that solids being removed from tanks used to contain contaminated liquids are sampled and analyzed for all contaminants of concern. If suitable for bioremediation, the solids may be placed in a treatment cell. If unsuitable for bioremediation, the solids must be disposed of at an approved facility. The solids may not be discharged to the environment unless all contaminants are present at concentrations below any applicable standards in the *Contaminated Sites Regulation*.

PART 10. SPILLS

1. The permittee shall ensure that substances are stored or handled so as not to cause spills, leakage, leaching or other discharges or releases of the substances from their storage containers, equipment, or other sources.
2. The permittee shall contact either an Environmental Protection Officer or the 24-hour Yukon Spill Report Centre (867-667-7244), as soon as possible under the circumstances, in the event of a release, spill, unauthorized emission, discharge or escape of any material as defined in s.132 of the *Environment Act* and/or as listed in the *Spills Regulations*.
3. The permittee shall ensure that appropriate clean-up equipment (such as sorbent, shovel, broom, bucket, gloves, boots, etc.) is in a readily available location on site.
4. The permittee shall ensure that emergency spill procedures are written down and available to all personnel when working on-site and that all personnel are familiar with those procedures.

PART 11. REPORTING AND RECORD KEEPING

1. The permittee shall maintain records detailing:
 - a) the origin of all contaminated material being treated;
 - b) the volume of contaminated material accepted from each source;
 - c) a figure(s) showing the entire facility including the location within the facility of contaminated material from each source;
 - d) the total volume of contaminated material in the facility;
 - e) soil and/or water analysis results for samples from any contaminated material accepted for treatment or removed from the facility;
 - f) soil and/or water analysis results for any interim samples taken in order to assess remediation progress;
 - g) results of any water analyses conducted on runoff from the facility;
 - h) details of any nutrients added (including type, dates, and quantity);
 - i) soil and/or water analysis results for any confirmatory samples taken for the purpose of determining if the soil or water was remediated;

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
JUL 19 2010
Date:..... Initials:.....

- j) details of any handling of special waste (including volumes accepted or removed from the facility);
 - k) the volume of material removed from the facility, the location and applicable land use(s) of the receiving site(s), and the written approval of the Branch for removal of the material; and
 - l) details of all inspections of the facility undertaken by the permittee pursuant to section 4.1 of this permit, including the dates of inspection and observations.
2. The permittee shall submit an annual report to the Branch on or before March 31 of each year which includes but need not be limited to:
 - a) a description of all activities undertaken at the facility in the previous calendar year;
 - b) all records required to be maintained under section 11.1 as they pertain to the previous calendar year and reflective of conditions as of the end of that year, including original laboratory reports for all sample results reported;
 - c) a sampling and monitoring plan for the current calendar year, pursuant to section 7.1 of this permit; and
 - d) a workplan for the entire facility for the current calendar year.
 3. Notwithstanding the reporting requirements listed in section 11.2, analysis results for samples from contaminated or remediated material accepted for treatment or removed from the facility need not be included in the annual report where these results have previously been submitted in support of a relocation permit or a request for authorization to remove material. Additionally, authorizations received from the Branch (such as for the removal of treated soil) need not be included in the annual report. All other applicable information pertaining to this material (e.g. volumes, sources, etc.) must still be included in the report.
 4. The permittee shall ensure that the annual report described in section 11.2 notes and describes any case where a requirement of section 11.1 does not apply (for example, if no nutrients were added in the previous calendar year). The permittee shall submit the annual report described in section 11.2 even if no activity was undertaken in the previous calendar year.
 5. The permittee shall keep all records required by section 11.1 for a minimum of three years, and shall make them available upon request for inspection by an environmental protection officer.

PART 12. DECOMMISSIONING

1. At least 30 days prior to the intended closure of the facility or of any individual cells, the permittee shall submit a detailed decommissioning plan to the Branch which includes:
 - a) a schedule for decommissioning the facility or cells;
 - b) the results of sampling demonstrating the levels of contaminants in all soil in the facility or in the individual cells to be decommissioned;
 - c) details of the intended or actual use and receiving location of all soil in the facility or in the individual cells to be decommissioned;
 - d) a description of intended future land uses for the site location;
 - e) a description of the methods to be used to restore the site or to prepare the site for its future uses; and
 - f) any other information required by the Branch.

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: JUL 19 2010 Initials:.....

2. The permittee shall obtain the Branch's written approval of the decommissioning plan prior to the commencement of any work to decommission the facility or any individual cells.
3. All work to decommission the facility or any individual cells shall be carried out in accordance with the decommissioning plan approved by the Branch.
4. If sampling indicates that all the contaminated material in the facility has been remediated and when no further contaminated material is to be accepted at the facility, the permittee shall:
 - a) conduct confirmatory sampling in accordance with *Protocol 11: Sampling Procedures for Land Treatment Facilities*, if the previous sampling was not confirmatory sampling;
 - b) submit the results of the confirmatory sampling to the Branch and request approval to remove the remediated contaminated material;
 - c) remove the remediated contaminated material in accordance with the approval granted by the Branch;
 - d) submit a decommissioning plan, as described in section 12.1 above, to the Branch within six months of removing the remediated contaminated material from the facility; and
 - e) decommission the facility in accordance with the approved decommissioning plan within six months of receiving approval from the Branch or as directed by the Branch.

THIS PERMIT REPLACES PERMIT #24-022 ISSUED ON DECEMBER 16, 2009, IS EFFECTIVE FROM THE DATE OF THE DIRECTOR'S SIGNATURE, AND SHALL EXPIRE ON DECEMBER 31, 2012.

S. Jensen
A/ Director, Environmental Programs Branch
Department of Environment

July 16/10
Date

I, Pamela Ullhava [print name clearly], certify that I am an authorized representative of Yukon Zinc Corporation, and that I have read and understood the terms and conditions of this permit.

[Signature]
Authorized Representative
Yukon Zinc Corporation

July 15, 2010
Date

DEPARTMENT OF ENVIRONMENT
ENVIRONMENTAL PROGRAMS
Whitehorse, Yukon
Certified true copy of original
Date: **JUL 19 2010** Initials:.....

Appendix B: Landfill Area and Incinerator Sheets

- **Landfill Area Inspection Log**
- **Incinerator Log**
- **Incinerator Pre-Operational Check Sheet**



Incinerator Log

DATE	Name of Operator	Incinerator Start time	Incinerator End time	Incinerator Use							Open Burning		Description of all maintenance and inspections (including fueling)
				Kitchen/Putrescible waste	General waste	Animal solids	Contaminated waste	Volume of waste into incinerator (Kg) (Max. amount < 99 kg/day)	Volume of Ash removed prior to disposal into landfill (kg)	Average Temp. in secondary chamber (degrees C)	Volume of Solid Waste open burned (kg) (must be < 49 kg/day)	Volume of Untreated Wood open-burned (kg) (no quantity limit)	
07-Feb-11	Sparky Burns-a-Lot	7:30	10:30	X	X		X	35	10	820	25	50	Fueled tank, pre-op inspection done, small leak on feed door gasket, needs repairing, inspected fuel line and cleaned blowers
07-Feb-11	Sparky Burns-a-Lot	19:30	20:30	X	X			25	6	790	-	-	no maintenace done on second burn

Kitchen/Putrescible waste: Food, animal and vegetable wastes
General waste: Rubbish and garbage; office trash
Animal solids: Carcasses, medical waste, biosolids
Contaminated waste: Industrial processes wastes, spill pads, oil filters, hydraulic hoses
Open burning of solid waste: Cardboard and plastics



Incinerator Pre-Operational Check Sheet

The purpose of the walk-around check is to ensure the incinerator is ready and safe for production operations. The walk-around check must be performed by the qualified Operator designated to use the equipment prior to operation. Operators are to inform the Supervisor if machine problems are found during walk-around checks. The Supervisor will arrange for maintenance, as required.

- The appropriate P.P.E. is worn for working with the incinerator.
- The burner chamber is cleaned out and no hot ambers or flames are present.
- The seal around the door frame is inspected for rips, tears or absent sections.
- The blower safety relay switch is not stuck and the retract spring is in good working order
- The fire extinguisher is present and operational
- The fuel shut off is free moving and not seized.
- All fuel lines are inspected for leaks or abrasions.
- No flammable material is in the immediate area of the incinerator.

Operator Name: _____ Date: _____

Appendix C: Special Waste MSDS

VINYL INDUSTRIAL PAINTS, INC.

Vinyl Coating Development & Custom Color Matching

Material Safety Data Sheet Aerosol Cans – Paint

SECTION I	
Manufacturer's Name Vinyl Industrial Paints, Inc.	Emergency Telephone Number 248-476-7264
Address (Number, Street, City, State and ZIP) 1401 Sycamore Wyandotte, MI 48192	Telephone Number for Information 734-284-3536
Dot Category Consumer Commodity ORM-D	Date Prepared January 1, 2008
	Signature of Preparer M. T. Muscat

SECTION II – Hazardous Ingredients/Identity Information				
Hazardous Components [Specific Chemical Identity, Common Name(s)]	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
25086-48-0 Vinyl Chloride Resin	None Hazardous		Units	2.30
80-62-6 Acrylic Resin	None Hazardous			1.90
117-81-7 Dioctyl Phthalate Plasticizer	5mg/m ³	10mg/m ³		0.18
Pigment (No Pb,Cd Nor Cr)	None Hazardous			13.00
112926-00-8 Flattening Agent 5110	Unknown	Unknown		16.22
1330-20-7 Xylene	100	150	PPM	13.65
108-88-3 Toloul	50	100	PPM	5.10
78-93-3 Methyl Ethyl Ketone	200	200	PPM	6.30
108-10-1 Methyl Isobutyl Ketone	50	50	PPM	8.15
67-64-1 Acetone	750	750	PPM	23.24
74-98-6 Propane (propellant)	1000		PPM	6.64
763-69-9 Ethyl 3 – Ethoxyproionate	Not Established			3.32

VOC as a percent by weight – 74

SECTION III – Physical/Chemical Characteristics			
Boiling Point	0 - 395°F	Specific Gravity (H₂O = 1)	N/A
Vapor Pressure (mm Hg.)	760	Melting Point	N/A
Vapor Density (AIR = 1)	Heavier than Air	Evaporation Rate (Butyl Acetate = 1)	Faster than Ether
Solubility in Water	N/A		
Appearance and Odor	Paint - Solvent Odor		

SECTION IV – Fire and Explosion Hazard Data			
Flash Point (Method Used) Below 21°F	Flammable Limits	LEL 0.5	UEL 36.5

Extinguishing Media

Carbon Dioxide, Dry Chemical, Foam

Special Fire Fighting Procedures

Full protective equipment including self-contained breathing apparatus. Water may be ineffective. Water may be used to cool containers to prevent pressure build-up and possible auto ignition or explosion when exposed to extreme heat.

Unusual Fire and Explosion Hazards

Closed containers may explode (due to build-up of pressure) when exposed to extreme heat.

SECTION V – Reactivity Data			
Stability	Unstable		Conditions to Avoid
	Stable	X	Avoid excessive heat and open flame, strong oxidizing agents

Incompatibility (Materials to Avoid)

None Known

Hazardous Decomposition or Byproducts

By fire – carbon dioxide, carbon monoxide, oxides of metals

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Material Safety Data Sheet
Aerosol Cans - Paint
Page 2

SECTION VI – Health Hazard Data

Route(s) of Entry	Inhalation? Yes	Skin? Yes	Ingestion? Yes
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Health Hazards (Acute and Chronic)
 Irritation to eyes, skin and respiratory system due to over-exposure. Extreme over-exposure may result in unconsciousness and possibly death. Chronic prolonged exposure to solvents listed in Section II may cause adverse effect to liver, urinary, cardiovascular and reproductive systems. May increase the nervous system effects of other solvents.

Carcinogenicity	NTP? No	IARC Monographs? No	OSHA Regulated? No
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No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Signs and Symptoms of Exposure
 Headache, dizziness, nausea and loss of coordination. Redness and itching or burning sensation may indicate eye or skin exposure.

Medical Conditions Generally Aggravated by Exposure
 None generally recognized.

Emergency and First Aid Procedures
 Inhalation: Remove from exposure. Restore breathing, keep warm and quiet.
 Skin Contact: Wash area thoroughly with soap and water.
 Eye Contact: Wash with water for 15 minutes. Seek medical attention.
 Ingestion: Never give anything by mouth to an unconscious person. Do not induce vomiting. Give several glasses of water and seek medical attention.

SECTION VII – Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled
 Remove all sources of ignition. Ventilate and remove with inert absorbent.

Waste Disposal Method
 Do not incinerate. Depressurize container, dispose of in accordance with Federal, State and Local regulations regarding pollution.

Precautions to Be Taken in Handling and Storage
 Extremely flammable. Keep away from heat, sparks and open flame. Vapors will accumulate readily and ignite explosively. Keep area well ventilated. Do not smoke. Extinguish all flames or anything else that may be a source of ignition. Contents under pressure. Do not puncture, incinerate or expose to temperatures above 120°F. Do not take internally. Keep out of reach of children. Intentionally ingesting or inhaling contents can be harmful or fatal.

SECTION VIII – Control Measures

Respiratory Protection (Specify Type)
 Local exhaust preferable.

Ventilation	Local Exhaust	Special
	Yes	Organic Vapor/Particulate – NIOSH/MSHA
	Mechanical (General)	Other
	Fan 1500 CFM	Dust/Mist Respirator

Protective Gloves Recommended by glove supplier for Section II	Eye Protection Safety spectacles with perforated side shields
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Other Protective Clothing or Equipment
 Impervious apron

SECTION IX – Other Information

Suggested HMIS Ratings	Health	Fire	Reactivity	P.P.E.
	2	3	0	G

Section 1 - Chemical Product and Company Identification

Product Name: Waste NON-RCRA Liquid (Antifreeze) – Profile #335918
Part Number(s): None
CAS Number: NOT APPLICABLE TO MIXTURES
Product Class: Acuson Waste
Waste Stream: Dicing and other general facilities
Manufacturer: Acuson Corporation, 8357 Canoga Ave , Canoga Park, CA 91304
Information Phone No.: (818) 734-4920 **Emergency Phone No.:** (818) 594-9437 pager

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% wt
Water	none	90-98
Monoethanolamine		<1
Diethanolamine		<1
Triethanolamine		<1
Copper		<1
Nickel		<1
Dirt/Debris		1-2

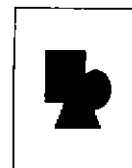
Section 3 - Physical and Chemical Properties

Physical State: Liquid
Appearance and Odor: one layer
Vapor Density (Air=1): N/A
Specific Gravity (@ 20 °C): 1.1
Density: N/A

Boiling Range: N/A
Refractive Index (@ 25 °C): N/A
% Volatile: N/A
Evaporation Rate: N/A
Vapor Pressure (@ 68 °F): N/A

Section 4 - Fire-Fighting Measures

Flash Point: >200
Flash Point Method: N/A
LEL: N/A
Flammability Classification: None
Extinguishing Media: N/A
Unusual Fire or Explosion Hazards: N/A
Special Fire-Fighting Procedures: None



Section 5 - Stability and Reactivity

Stability: Stable.
Polymerization: Hazardous polymerization will not occur
Incompatibilities & Conditions to Avoid: N/A
Hazardous Decomposition Products: N/A

Section 6 - Health Hazard Information

Potential Health Effects

Primary Entry Routes: Skin, inhalation.
Target Organs: N/A
Effects of Overexposure: N/A
Carcinogenicity: N/A.
Chronic Effects: N/A

Emergency and First Aid Procedures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately.
Eye Contact: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists
Skin Contact: Immediately wash skin with soap and plenty of water.
Ingestion: GET MEDICAL ATTENTION IMMEDIATELY

Section 7 - Spill, Leak, and Disposal Procedures

Spill/Leak Procedures: Wear appropriate personal protective equipment. Transfer to disposal containers. Do not release into sewers or waterways
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations

Section 8 - Exposure Controls / Personal Protection

Ventilation: Provide general or local exhaust ventilation systems
Administrative Controls: N/A
Respiratory Protection: N/A.
Protective Clothing/Equipment: Wear chemically protective gloves and aprons to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Special Precautions and Comments

Handling Precautions: Use in well-ventilated area. Wash thoroughly after handling
Storage Requirements: Keep container closed when not in use.
California Proposition 65: This product contains the following chemicals known to the state of California to cause cancer and/or reproductive toxicity: None

DOT Transportation Data (49 CFR 172.101):

PART NUMBER(S) SHIPPING NAME HAZARD CLASS ID NO. PACKING GROUP

Non-RCRA Hazardous Waste, Liquid (Diethanolamine, Boric Acid)_

SARA TITLE III SECTION 313 SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-To-Know-Act of 1986 & of 40CFR 372

Chemical Name CAS Number % wt.

None

Prepared By: Behnaz Partovi 2/26/01

Disclaimer: All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product. Users also assume all risks in regards to the publications of use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or process.



MATERIAL SAFETY DATA SHEET

March 22, 2010

MSDS NUMBER W-3060

EMERGENCY TELEPHONE NUMBERS	COMPANY 405-665-6565	CHEMTREC 800/424-9300
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I. PRODUCT IDENTIFICATION

PRODUCT ULTRA LOW SULFUR DIESEL FUEL (DYED)	CHEMICAL NAME AND SYNONYMS Petroleum Hydrocarbon Mixture, Distillate,		
CHEMICAL FAMILY Petroleum Hydrocarbon Distillate	FORMULA C11 - C20		
National Fire Protection Association Hazard Rating Codes Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4	HEALTH CODE 0	FIRE CODE 2	REACTIVITY CODE 0

II. SUMMARY OF HAZARDS

CAUTION! COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF INHALED AND MAY CAUSE DELAYED LUNG INJURY. CAN CAUSE NERVOUS SYSTEM DEPRESSION. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. Keep away from heat and flame. Avoid breathing vapor. Use ventilation adequate to keep vapor below recommended exposure limits. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

NIOSH, EPA, & current literature have indicated that breathing whole diesel exhaust over a working lifetime may cause cancer in humans. Animals exposed to whole diesel exhaust over a lifetime have developed lung tumors (cancer). Diesel exhaust may cause eye irritation, headache, light-headedness, nausea, vomiting, heartburn, weakness, numbness, tingling in the extremities, chest tightness and wheezing. Cough and labored breathing have been reported in garage workers without adequate ventilation (air circulation) in the garage.

DOT Hazardous Material YES	DOT SHIPPING NAME AND NUMBER Diesel Fuel, 3, NA1993, III	DOT HAZARD CLASS 3 (Flammable Liquid)
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III. HAZARDOUS COMPONENTS

INGREDIENT	% RANGE	PEL/TLV	HAZARD
Straight Run Middle Distillate (CAS # 64741-44-2)	60 to 100 %	Petroleum Distillate TWA - 400 ppm	Combustible Acute Health Chronic Health
Light Catalytic Cracked Distillate (CAS # 64741-59-9)	0 to 40 %	Petroleum Distillate TWA - 400 ppm	

Diesel exhaust contains: Nitrogen Dioxide, Sulfuric Acid, Sulfur Dioxide, Aliphatic Aldehydes, Soot containing Polynuclear Aromatic Hydrocarbons, Carbon Monoxide, Hydrogen Sulfide.

IV. HEALTH INFORMATION

EXPOSURE BY ROUTE OF ENTRY	EXPOSURE CHARACTERISTICS AND FIRST AID	
INHALATION	EFFECTS	Acute: Headache, nasal and respiratory irritation, nausea, drowsiness, breathlessness, fatigue, central nervous system depression, convulsions, and loss of consciousness.
	FIRST AID	Move exposed person to fresh air. If breathing has stopped, perform artificial respiration. Get medical attention as soon as possible.
SKIN	EFFECTS	Acute: irritation Chronic: dermatitis
	FIRST AID	If clothing soaked, immediately remove clothing and wash skin with soap and water. Launder clothing before wearing. Get medical attention promptly.
EYES	EFFECTS	Acute: irritation
	FIRST AID	Immediately flush eyes with water for a minimum of 15 minutes, occasionally lifting the lower and upper lids. Get medical attention promptly.
SWALLOWING INGESTION	EFFECTS	Acute: aspiration hazard, headache, nausea, drowsiness, fatigue, pneumonitis, pulmonary edema, central nervous system depression, convulsions and loss of consciousness.
	FIRST AID	Call a physician immediately, ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person

Medical conditions Generally

Agravated by Exposure

N/AV

LISTED AS POTENTIAL CARCINOGEN OR CARCINOGEN	NOT LISTED <u> X </u> INTERNATIONAL Agency for Research on Cancer _____	NATIONAL TOXICOLOGY PROGRAM _____ OSHA _____
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V. EMPLOYEE PROTECTION

RESPIRATORY PROTECTION (NIOSH APPROVED RESPIRATORS SEE OSHA STD. 1910.134)

Up to 4000 ppm, half-mask organic vapor respirator. Up to 20,000 ppm, full-face organic vapor respirator or full-face supplied air respirator. Greater than 20,000 ppm, fire fighting, or unknown concentration, self-contained breathing apparatus with positive pressure.

	EYE	Safety glasses, chemical goggles or face shield as appropriate.
	SKIN	Gloves: Nitrile, neoprene or other material resistant to distillate.

VENTILATION

Maintain local or dilution ventilation to keep air concentration below 400 ppm. Loading, unloading, tank gauging, etc., remain upwind. Request assistance of safety and industrial hygiene personnel to determine air concentrations.

VI. FIRE PROTECTION INFORMATION

FLASH POINT AND METHOD	AUTOIGNITION TEMPERATURE ESTIMATED	FLAMMABLE LIMITS % VOLUME IN AIR ESTIMATED	LOWER	UPPER
Tag Closed Cup 130 °F	490 °F		0.7	6

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical, or foam. Water stream may spread fire, use water spray only to cool containers exposed to fire. If leak or spill has not ignited, use water spray to disperse the vapors.

HAZARDOUS DECOMPOSITION PRODUCTS

Incomplete combustion can yield carbon monoxide and various hydrocarbons.

FIRE AND EXPLOSION HAZARDS

Can form combustible mixtures with air when heated.

STORAGE

Do not store with strong oxidizers. Store as OSHA Class II combustible liquid.

HAZARDOUS POLYMERIZATION

WILL NOT OCCUR MAY OCC

STABILITY

STABLE UNSTABLE

VII. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT	Reid VAPOR PRESSURE (RVP) at 100 °F ESTIMATED	EVAPORATION (ETHYL ETHER = 1) ESTIMATED
330 - 675 °F	less than 0.1 pound	slower
PERCENT VOLATILE BY VOLUME (%)	AVG. MOLECULAR WEIGHT	APPEARANCE
100	N/A	May be clear to yellow-brown
ODOR	DROP POINT	ESTIMATED VAPOR DENSITY (AIR = 1)
Diesel Fuel	Pour Point -25 to +10 °F	6
SPECIFIC GRAVITY	VISCOSITY	SOLUBILITY (G/100g WATER AT 20° C)
0.8 to 0.9	2 to 4 cs at 100°F	Negligible

VIII. ENVIRONMENTAL PROTECTION

S P I L L S	Notify emergency response personnel. Evacuate area and remove ignition sources. Build dike to contain flow. Remove free liquid, do not flush to sewer or open water. Pick up with inert absorbent and place in closed container for disposal.
D W I A S S P T O E S A L	Utilize licensed waste disposal company. Consider recycling or incineration. Utilize permitted hazardous waste disposal site or industrial waste disposal site as appropriate.

ADDITIONAL INFORMATION

The following chemicals are subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and reauthorization Act of 1986 and 40 CFR Part 372:

PREPARED BY	DATE PREPARED
Johnnie L. Ray	March 22, 2010

DISCLAIMER

The information and recommendations contained in this publication have been compiled from sources believed to be reliable and to represent the best current opinion on the subject at the time of publication. Since we cannot anticipate or control the many different conditions under which this information or our products may be used, we make no guarantee that the recommendations will be adequate for all individuals or situations. Each user of the product described herein should determine the suitability of the described product for his particular purpose and should comply with all federal and state rules and regulations concerning the described product.

ABBREVIATIONS

CAS #	Chemical Abstracts Service Number
N/A	Not Applicable
N/AV	Not Available
ppm	Parts per million
PEL	Permissible Exposure Limit
TLV	Threshold Limit Value
	Both the OSHA PEL and the American Conference of Governmental Industrial Hygienists TLV were reviewed. Where a difference existed, the more restrictive of the two was selected.
STEL	Short Term Exposure Limit
TWA	Time-Weighted Average

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID

(US, CN, EU Version for International Trade)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Lead Acid Battery Wet, Filled With Acid
OTHER PRODUCT NAMES: Electric Storage Battery, SLI or Industrial Battery, UN2794

MANUFACTURER: East Penn Manufacturing Company, Inc.
DIVISION: Deka Road
ADDRESS: Lyon Station, PA 19536 USA

EMERGENCY TELEPHONE NUMBERS: US: CHEMTREC 1-800-424-9300
 CN: CHEMTREC 1-800-424-9300
 Outside US: 1-703-527-3887

NON-EMERGENCY HEALTH/SAFETY INFORMATION: 1-610-682-6361

CHEMICAL FAMILY: This product is a wet lead acid storage battery. May also include gel/absorbed electrolyte type lead acid battery types.

PRODUCT USE: Industrial/Commercial electrical storage batteries.

This product is considered a Hazardous Substance, Preparation or Article that is regulated under US-OSHA; CAN-WHMIS; IOSH; ISO; UK-CHIP; or EU Directives (67/548/EEC-Dangerous Substance Labelling, 98/24/EC-Chemical Agents at Work, 99/45/EC-Preparation Labelling, 2001/58/EC-MSDS Content, and 1907/2006/EC-REACH), and an MSDS/SDS is required for this product considering that when used as recommended or intended, or under ordinary conditions, it may present a health and safety exposure or other hazard.

Additional Information

This product may not be compatible with all environments, such as those containing liquid solvents or extreme temperature or pressure. Please request information if considering use under extreme conditions or use beyond current product labelling.


SECTION 2: HAZARDS IDENTIFICATION

GHS Classification:

Health	Environmental	Physical
Acute Toxicity – Not listed (NL) Eye Corrosion – Corrosive* Skin Corrosion – Corrosive* Skin Sensitization – NL Mutagenicity/Carcinogenicity – NL Reproductive/Developmental – NL Target Organ Toxicity (Repeated) – NL	Aquatic Toxicity – NL	NFPA – Flammable gas, hydrogen (during charging) CN - NL EU - NL

*as sulfuric acid

GHS Label: Lead Acid Battery, Wet

Symbols: C (Corrosive)		
Hazard Statements Contact with internal components may cause irritation of severe burns. Irritating to eyes, respiratory system, and skin.	Precautionary Statements Keep out of reach of children. Keep containers tightly closed. Avoid heat, sparks, and open flame while charging batteries. Avoid contact with internal acid.	

EMERGENCY OVERVIEW: May form explosive air/gas mixture during charging. Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin. Prolonged

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID

(US, CN, EU Version for International Trade)

inhalation or ingestion may result in serious damage to health. Pregnant women exposed to internal components may experience reproductive/developmental effects.

POTENTIAL HEALTH EFFECTS:

EYES: Direct contact of internal electrolyte liquid with eyes may cause severe burns or blindness.
SKIN: Direct contact of internal electrolyte liquid with the skin may cause skin irritation or damaging burns.
INGESTION: Swallowing this product may cause severe burns to the esophagus and digestive tract and harmful or fatal lead poisoning. Lead ingestion may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints.
INHALATION: Respiratory tract irritation and possible long-term effects.

ACUTE HEALTH HAZARDS:

Repeated or prolonged contact may cause mild skin irritation.

CHRONIC HEALTH HAZARDS:

Lead poisoning if persons are exposed to internal components of the batteries. Lead absorption may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints. Other effects may include central nervous system damage, kidney dysfunction, and potential reproductive effects. Chronic inhalation of sulfuric acid mist may increase the risk of lung cancer.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Respiratory and skin diseases may predispose the user to acute and chronic effects of sulfuric acid and/or lead. Children and pregnant women must be protected from lead exposure. Persons with kidney disease may be at increased risk of kidney failure.

Additional Information

No health effects are expected related to normal use of this product as sold.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENTS (Chemical/Common Names):</u>	<u>CAS No.:</u>	<u>% by Wt:</u>	<u>EC No.:</u>
Lead, inorganic	7439-92-1	43-70 (average: 65)	231-100-4
Sulfuric acid	7664-93-9	20-44 (average: 25)	231-639-5
Antimony	7440-36-0	0-4 (average: 1)	231-146-5
Arsenic	7440-38-2	<0.01	231-148-6
Polypropylene	9003-07-0	5-10 (average: 8)	NA
NA: Not applicable; ND: Not determined			

Additional Information

These ingredients reflect components of the finished product related to performance of the product as distributed into commerce.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush eyes with large amounts of water for at least 15 minutes. Seek immediate medical attention if eyes have been exposed directly to acid.
SKIN CONTACT: Flush affected area(s) with large amounts of water using deluge emergency shower, if available, shower for at least 15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.
INGESTION: If swallowed, give large amounts of water. Do NOT induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death.
INHALATION: If breathing difficulties develop, remove person to fresh air. If symptoms persist, seek medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE/UNSUITABLE EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water, foam. Do not use water on live electrical circuits.

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID
(US, CN, EU Version for International Trade)

SPECIAL FIREFIGHTING PROCEDURES & PROTECTIVE EQUIPMENT:

Use appropriate media for surrounding fire. Do not use carbon dioxide directly on cells. Avoid breathing vapours. Use full protective equipment (bunker gear) and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Batteries evolve flammable hydrogen gas during charging and may increase fire risk in poorly ventilated areas near sparks, excessive heat or open flames.

SPECIFIC HAZARDS IN CASE OF FIRE:

Thermal shock may cause battery case to crack open. Containers may explode when heated.

Additional Information

Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Avoid Contact with Skin. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium bicarbonate, or very dilute sodium hydroxide solutions.

ENVIRONMENTAL PRECAUTIONS:

Prevent spilled material from entering sewers and waterways.

SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS:

Add neutralizer/absorbent to spill area. Sweep or shovel spilled material and absorbent and place in approved container. Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.

Additional Information

Lead acid batteries and their plastic cases are recyclable. Contact your East Penn representative for recycling information.

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING AND STORAGE:

- Keep containers tightly closed when not in use.
- If battery case is broken, avoid contact with internal components.
- Do not handle near heat, sparks, or open flames.
- Protect containers from physical damage to avoid leaks and spills.
- Place cardboard between layers of stacked batteries to avoid damage and short circuits.
- Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.

OTHER PRECAUTIONS (e.g.; Incompatibilities):

Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS/SYSTEM DESIGN INFORMATION:

Charge in areas with adequate ventilation.

VENTILATION:

General dilution ventilation is acceptable.

RESPIRATORY PROTECTION:

Not required for normal conditions of use. See also special firefighting procedures (Section 5).

EYE PROTECTION:

Wear protective glasses with side shields or goggles.

SKIN PROTECTION:

Wear chemical resistant gloves as a standard procedure to prevent skin contact.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Chemically impervious apron and face shield recommended when adding water or electrolyte to batteries.

Wash Hands after handling.

EXPOSURE GUIDELINES & LIMITS:

MATERIAL SAFETY DATA SHEET

LEAD ACID BATTERY WET, FILLED WITH ACID

(US, CN, EU Version for International Trade)

EXPOSURE GUIDELINES & LIMITS:

OSHA	Permissible Exposure Limit (PEL/TWA)	Lead, inorganic (as Pb)	0.05 mg/m ³	
		Sulfuric acid	1.00 mg/m ³	
ACGIH	2007 Threshold Limit Value (TLV)	Antimony	0.50 mg/m ³	
		Arsenic	0.01 mg/m ³	
		Lead, inorganic (as Pb)	0.05 mg/m ³	
		Sulfuric acid	0.20 mg/m ³	
		Antimony	0.50 mg/m ³	
Quebec	Permissible Exposure Value (PEV)	Arsenic	0.01 mg/m ³	
		Lead, inorganic (as Pb)	0.15 mg/m ³	
		Sulfuric acid	1.00 mg/m ³	TWA
			3.00 mg/m ³	STEV
Ontario	Occupational Exposure Level (OEL)	Antimony	0.50 mg/m ³	
		Arsenic	0.10 mg/m ³	
		Lead (designated substance)	0.10 mg/m ³	
		Sulfuric acid	1.00 mg/m ³	TWAEV
			3.00 mg/m ³	STEV
Netherlands	Maximaal Aanvaarde Concentratie (MAC)	Antimony	0.50 mg/m ³	
		Arsenic (designated substance)	0.01 mg/m ³	
		Lead, inorganic (as Pb)	0.15 mg/m ³	
Germany	Maximale Arbeitsplatzkonzentrationen (MAK)	Sulfuric acid	1.00 mg/m ³	
		Lead, inorganic (as Pb)	0.10 mg/m ³	
United Kingdom	Occupational Exposure Standard (OES)	Sulfuric acid	1.00 mg/m ³	TWA
			2.00 mg/m ³	STEL
		Antimony	0.50 mg/m ³	
		Lead	0.15 mg/m ³	
		Arsenic	0.50 mg/m ³	
		Arsenic	0.10 mg/m ³	

TWA: 8-Hour Time-Weighted Average; STE: Short-Term Exposure; mg/m³: milligrams per cubic meter of air; NE: Not Established; STEV: Short-Term Exposure Value; TWAEV: Time-Weighted Average Exposure Value; STEL: Short-Term Exposure Limit

Additional Information

- Batteries are housed in polypropylene cases which are regulated as total dust or respirable dust only when they are ground up during recycling. The OSHA PEL for dust is 15 mg/m³ as total dust or 5 mg/m³ as respirable dust.
- May be required to meet Domestic Requirements for a Specific Destination(s).

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Industrial/commercial lead acid battery
ODOUR:	Odourless
ODOUR THRESHOLD:	NA
PHYSICAL STATE:	Sulfuric Acid: Liquid; Lead: solid
pH:	<1
BOILING POINT:	235-240° F (113-116° C) (as sulfuric acid)
MELTING POINT:	NA
FREEZING POINT:	NA
VAPOUR PRESSURE:	10 mmHg
VAPOUR DENSITY (AIR = 1):	> 1
SPECIFIC GRAVITY (H₂O = 1):	1.27-1.33
EVAPORATION RATE (n-BuAc=1):	< 1
SOLUBILITY IN WATER:	100% (as sulfuric acid)
FLASH POINT:	Below room temperature (as hydrogen gas)
AUTO-IGNITION TEMPERATURE:	NA
LOWER EXPLOSIVE LIMIT (LEL):	4% (as hydrogen gas)
UPPER EXPLOSIVE LIMIT (UEL):	74% (as hydrogen gas)

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID

(US, CN, EU Version for International Trade)

PARTITION COEFFICIENT: NA
VISCOSITY (poise @ 25° C): Not Available
DECOMPOSITION TEMPERATURE: Not Available

FLAMMABILITY/HMIS HAZARD CLASSIFICATIONS (US/CN/EU): As sulfuric acid
HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 2

SECTION 10: STABILITY AND REACTIVITY

STABILITY: This product is stable under normal conditions at ambient temperature.
INCOMPATIBILITY (MATERIAL TO AVOID): Strong bases, combustible organic materials, reducing agents, finely divided metals, strong oxidizers, and water.
HAZARDOUS DECOMPOSITION BY-PRODUCTS: Thermal decomposition will produce sulfur dioxide, sulfur trioxide, carbon monoxide, sulfuric acid mist, and hydrogen.
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Overcharging, sources of ignition

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (Test Results Basis and Comments):

Sulfuric acid: LD50, Rat: 2140 mg/kg
LC50, Guinea pig: 510 mg/m³
Lead: No data available for elemental lead

SUBCHRONIC/CHRONIC TOXICITY (Test Results and Comments):

Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood lead levels of 50 µg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

Additional Information

- Very little chronic toxicity data available for elemental lead.
- Lead is listed by IARC as a 2B carcinogen: possible carcinogen in humans. Arsenic is listed by IARC, ACGIH, and NTP as a carcinogen, based on studies with high doses over long periods of time. The other ingredients in this product, present at equal to or greater than 0,1% of the product, are not listed by OSHA, NTP, or IARC as suspect carcinogens.
- The 19th Amendment to EC Directive 67/548/EEC classified lead compounds, but not lead in metal form, as possibly toxic to reproduction. Risk phrase 61: May cause harm to the unborn child, applies to lead compounds, especially soluble forms.

SECTION 12: ECOLOGICAL INFORMATION

PERSISTENCE & DEGRADABILITY:

Lead is very persistent in soils and sediments. No data available on biodegradation.

BIOACCUMULATIVE POTENTIAL (Including Mobility):

Mobility of metallic lead between ecological compartments is low. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants, but very little bioaccumulation occurs through the food chain. Most studies have included lead compounds, not solid inorganic lead.

AQUATIC TOXICITY (Test Results & Comments):

Sulfuric acid: 24-hour LC50, fresh water fish (*Brachydanio rerio*): 82 mg/l
96-hour LOEC, fresh water fish (*Cyprinus carpio*): 22 mg/l (lowest observable effect concentration)
Lead (metal): No data available

Additional Information

- No known effects on stratospheric ozone depletion.
- Volatile organic compounds: 0% (by Volume)
- Water Endangering Class (WGK): NA

SECTION 13: DISPOSAL CONSIDERATIONS

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
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(US, CN, EU Version for International Trade)

WASTE DISPOSAL METHOD: Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

HAZARDOUS WASTE CLASS/CODE: US - Not applicable to finished product as manufactured for distribution into commerce.
 CN - Not applicable to finished product as manufactured for distribution into commerce.
 EWC - Not applicable to finished product as manufactured for distribution into commerce.

Additional Information
 Not Included - **Recycle** or dispose as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

SECTION 14: TRANSPORT INFORMATION

GROUND - US-DOT/CAN-TDG/EU-ADR/APEC-ADR:

Proper Shipping Name	Batteries, Wet, Filled with Acid		
Hazard Class	8	ID Number	UN2794
Packing Group	III	Labels	Corrosive

AIRCRAFT - ICAO-IATA:

Proper Shipping Name	Batteries, Wet, Filled with Acid		
Hazard Class	8	ID Number	UN2794
Packing Group	II	Labels	Corrosive

Reference IATA packing instructions 800

VESSEL - IMO-IMDG:

Proper Shipping Name	Batteries, Wet, Filled with Acid		
Hazard Class	8	ID Number	UN2794
Packing Group	III	Labels	Corrosive

Reference IMDG packing instructions P801

Additional Information

Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped.

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS:

All components are listed on the TSCA; EINECS/ELINCS; and DSL, unless noted otherwise below.

U.S. FEDERAL REGULATIONS:

TSCA Section 8b - Inventory Status: All chemicals comprising this product are either exempt or listed on the TSCA Inventory.

TSCA Section 12b - Export Notification: If the finished product contains chemicals subject to TSCA Section 12b export notification, they are listed below:

<u>Chemical</u>	<u>CAS #</u>
None	NA

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)

Chemicals present in the product which could require reporting under the statute:

<u>Chemical</u>	<u>CAS #</u>
Lead	7439-92-1
Sulfuric acid	7664-93-9

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

The finished product contains chemicals subject to the reporting requirements of Section 313 of SARA Title III.

<u>Chemical</u>	<u>CAS #</u>	<u>% wt</u>
Lead	7439-92-1	65
Sulfuric acid	7664-93-9	25

CERCLA SECTION 311/312 HAZARD CATEGORIES: Note that the finished product is exempt from these regulations, but lead and sulfuric acid above the thresholds are reportable on Tier II reports.

Fire Hazard	No
Pressure Hazard	No

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID

(US, CN, EU Version for International Trade)

Reactivity Hazard	No
Immediate Hazard	Yes (Sulfuric acid is Corrosive)
Delayed Hazard	No

Note: Sulfuric acid is listed as an Extremely Hazardous Substance.

STATE REGULATIONS (US):

California Proposition 65

The following chemicals identified to exist in the finished product as distributed into commerce are known to the State of California to cause cancer, birth defects, or other reproductive harm:

<u>Chemical</u>	<u>CAS #</u>	<u>% Wt</u>
Arsenic (as arsenic oxides)	7440-38-2	<0.1
Strong inorganic acid mists including sulfuric acid	NA	25
Lead	7439-92-1	65

California Consumer Product Volatile Organic Compound Emissions

This Product is not regulated as a Consumer Product for purposes of CARB/OTC VOC Regulations, as-sold for the intended purpose and into the industrial/Commercial supply chain.

INTERNATIONAL REGULATIONS (Non-US):

Canadian Domestic Substance List (DSL)

All ingredients remaining in the finished product as distributed into commerce are included on the Domestic Substances List.

WHMIS Classifications

Class E: Corrosive materials present at greater than 1%

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

NPRI and Ontario Regulation 127/01

This product contains the following chemicals subject to the reporting requirements of Canada NPRI +/-or Ont. Reg. 127/01:

<u>Chemical</u>	<u>CAS #</u>	<u>% Wt</u>
Lead	7439-92-1	65
Sulfuric acid	7664-93-9	25

European Inventory of Existing Commercial Chemical Substances (EINECS)

All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC.

R-Phrases

35, 36, 38

S-Phrases

1/2, 26, 30, 45

Additional Information

This product may be subject to Restriction of Hazardous Substances (RoHS) regulations in Europe and China, or may be regulated under additional regulations and laws not identified above, such as for uses other than described or as-designed/as-intended by the manufacturer, or for distribution into specific domestic destinations.

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:

Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

Sources of Information:

International Agency for Research on Cancer (1987), *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7*, Lyon, France.

Ontario Ministry of Labour Regulation 654/86. Regulations Respecting Exposure to Chemical or Biological Agents.

RTECS – Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health.

MSDS/SDS PREPARATION INFORMATION:

DATE OF ISSUE: **29 November 2010**

SUPERCEDES: **10 July 2010**

DISCLAIMER:

This Material Safety Data Sheet is based upon information and sources available at the time of preparation or revision date.

MATERIAL SAFETY DATA SHEET
LEAD ACID BATTERY WET, FILLED WITH
ACID

(US, CN, EU Version for International Trade)

The information in the MSDS was obtained from sources which we believe are reliable, but are beyond our direct supervision or control. We make no Warranty of Merchantability, Fitness for any particular purpose or any other Warranty, Expressed or Implied, with respect to such information and we assume no liability resulting from its use. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. It is the obligation of each user of this product to determine the suitability of this product and comply with the requirements of all applicable laws regarding use and disposal of this product. For additional information concerning East Penn Manufacturing Co., Inc. products or questions concerning the content of this MSDS please contact your East Penn representative.

END

Section 1 - Chemical Product and Company Identification

Product Name: Waste NON-RCRA Liquid (Antifreeze) – Profile #335918
Part Number(s): None
CAS Number: NOT APPLICABLE TO MIXTURES
Product Class: Acuson Waste
Waste Stream: Dicing and other general facilities
Manufacturer: Acuson Corporation, 8357 Canoga Ave , Canoga Park, CA 91304
Information Phone No.: (818) 734-4920 **Emergency Phone No.:** (818) 594-9437 pager

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% wt
Water	none	90-98
Monoethanolamine		<1
Diethanolamine		<1
Triethanolamine		<1
Copper		<1
Nickel		<1
Dirt/Debris		1-2

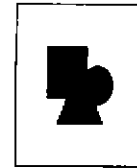
Section 3 - Physical and Chemical Properties

Physical State: Liquid
Appearance and Odor: one layer
Vapor Density (Air=1): N/A
Specific Gravity (@ 20 °C): 1.1
Density: N/A

Boiling Range: N/A
Refractive Index (@ 25 °C): N/A
% Volatile: N/A
Evaporation Rate: N/A
Vapor Pressure (@ 68 °F): N/A

Section 4 - Fire-Fighting Measures

Flash Point: >200
Flash Point Method: N/A
LEL: N/A
Flammability Classification: None
Extinguishing Media: N/A
Unusual Fire or Explosion Hazards: N/A
Special Fire-Fighting Procedures: None



Section 5 - Stability and Reactivity

Stability: Stable.
Polymerization: Hazardous polymerization will not occur
Incompatibilities & Conditions to Avoid: N/A
Hazardous Decomposition Products: N/A

Section 6 - Health Hazard Information

Potential Health Effects

Primary Entry Routes: Skin, inhalation.
Target Organs: N/A
Effects of Overexposure: N/A
Carcinogenicity: N/A.
Chronic Effects: N/A

Emergency and First Aid Procedures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately.
Eye Contact: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists
Skin Contact: Immediately wash skin with soap and plenty of water.
Ingestion: GET MEDICAL ATTENTION IMMEDIATELY

Section 7 - Spill, Leak, and Disposal Procedures

Spill /Leak Procedures: Wear appropriate personal protective equipment. Transfer to disposal containers. Do not release into sewers or waterways
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations

Section 8 - Exposure Controls / Personal Protection

Ventilation: Provide general or local exhaust ventilation systems
Administrative Controls: N/A
Respiratory Protection: N/A.
Protective Clothing/Equipment: Wear chemically protective gloves and aprons to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Special Precautions and Comments

Handling Precautions: Use in well-ventilated area. Wash thoroughly after handling
Storage Requirements: Keep container closed when not in use.
California Proposition 65: This product contains the following chemicals known to the state of California to cause cancer and/or reproductive toxicity: None

DOT Transportation Data (49 CFR 172.101):

PART NUMBER(S) SHIPPING NAME HAZARD CLASS ID NO. PACKING GROUP

Non-RCRA Hazardous Waste, Liquid (Diethanolamine, Boric Acid)_

SARA TITLE III SECTION 313 SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-To-Know-Act of 1986 & of 40CFR 372

Chemical Name CAS Number % wt.

None

Prepared By: Behnaz Partovi 2/26/01

Disclaimer: All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product. Users also assume all risks in regards to the publications of use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or process.

WASTE OIL

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Black to brown liquid
ODOUR: Petroleum
SOLUBILITY: Generally insoluble
VAPOUR: Few vapours emitted
DENSITY:

FLASH POINT: 100 to 200° C
FREEZING PT: -30 to -400° C
VISCOSITY: Medium (200-300cSt)
SPECIFIC
GRAVITY: Floats on water (0.9)

SAFETY MEASURES

WARNINGS

- Vapours are heavier than air but are unlikely to form.
- Toxic gas can form in fire and at high temperatures.
- CO, CO₂ and dense smoke are produced upon combustion.
- Oil mist or vapour from hot oil can cause irritation of the eyes and respiratory tract.

PERSONAL PROTECTION

- Always wear impervious, chemical-resistant clothing, gloves, footwear, and goggles; nitrile and Viton are suitable protective materials (DO NOT USE NATURAL RUBBER, NEOPRENE, OR PVC).
- Use of organic vapour cartridge respirator is highly unlikely.

PRECAUTIONS

- Avoid excessive heat, which can cause formation of vapours.
- Avoid contact with strong oxidizers, such as nitric acid, sulphuric acid, chlorine, ozone, and peroxides.
- Eliminate ignition sources.
- Restrict access and work upwind of spill.

RESPONSE TO FIRES

CONSIDER ACTION ONLY IF SAFETY PERMITS!

- Wear SCBA and eye protection when responding to waste oil fires.
 - Shut off fuel supply.
 - Extinguish fire with CO₂, dry chemical, alcohol foam or water fog.
- NOTE: Water or foam may cause frothing.
- Use water to cool containers exposed to fire.



WHMIS (Pictograms) 	WHMIS (Classification) Not controlled	Protective Clothing 	TDG (pictograms)
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Section 1. Chemical Product and Company Identification			
Product Name	DURON[®] XL 0W-30 ENGINE OIL	Code	420-050, DXL03
Synonym	RDL3283	Validated on	8/9/2002.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	DURON [®] XL 0W30 is an engine oil for use in 4-stroke compression and spark ignition engines under extended ambient conditions, including temperatures below -40°C. Mobile equipment applications include heavy duty highway and off-highway operations, as well as smaller trucks and cars. The product may also be used in many types of wet clutch transmissions and hydraulic systems.		

Section 2. Composition and Information on Ingredients					
			<i>Exposure Limits (ACGIH)</i>		
Name	CAS #	% (W/W)	TLV-TWA(8 h)	STEL	CEILING
1) Mixture of severely hydrotreated and hydrocracked base oil, synthetic hydrocarbons and other proprietary, non-hazardous additives.	Mixture	100	5 mg/m ³ (oil mist)	10 mg/m ³ (oil mist)	Not established
Manufacturer Recommendation	Not applicable				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification.	
Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.

Section 4. First Aid Measures	
Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures			
Flammability	May be combustible at high temperature.	Flammable Limits	Not available.
Flash Points	OPEN CUP: 231°C (447.8°F) (Cleveland)	Auto-Ignition Temperature	Fire Point: 249°C (480.2°F)
Fire Hazards in Presence of Various Substances	Low fire hazard. This material must be heated before ignition will occur.	Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.
Products of Combustion	Carbon oxides (CO, CO ₂), sulphur oxides (SO _x), CaO _x , ZnO _x , smoke and irritating vapours as products of incomplete combustion.		

Fire Fighting Media and Instructions	NAERG96, GUIDE 171, Substances (low to moderate hazard). If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (0.5 mile) in all directions; also, consider initial evacuation for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. SMALL FIRE: use DRY chemicals, foam, water spray or CO ₂ . LARGE FIRE: use water spray, fog or foam. For small outdoor fires, portable fire extinguishers may be used, and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.
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Section 6. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 171, Substances (low to moderate hazard). ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if without risk. Contain spill. Absorb with inert absorbents, dry clay, or diatomaceous earth. Avoid inhaling dust of diatomaceous earth for it may contain silica in very fine particle size, making this a potential respiratory hazard. Place used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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Section 7. Handling and Storage

Handling	Avoid inhalation and skin contact especially when handling used oil. Keep away from sources of ignition. DO NOT reuse empty containers without commercial cleaning or reconditioning. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles.

Section 8. Exposure Controls/Personal Protection

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

Section 9. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid.	Viscosity	69 cSt @ 40°C
Colour	Amber.	Pour Point	<-51°C
Odour	Mild petroleum oil like.	Softening Point	Not applicable.
Odour Threshold	Not available.	Dropping Point	Not applicable.
Boiling Point	Not available	Penetration	Not applicable.
Density	0.8427 kg/L @ 15°C (59°F).	Oil / Water Dist. Coefficient	Not available
Vapour Density	Not available.	Ionicity (in water)	Not available
Vapour Pressure	Negligible at ambient temperature and pressure.	Dispersion Properties	Not available
Volatility	Non-volatile.	Solubility	Insoluble in water.

Section 10. Stability and Reactivity

Corrosivity	Copper corrosion, 3h, 100°C (ASTM D0130): 1a.		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Incompatible with oxidizing agents, acids, halogens and halogen compounds.	Decomposition Products	CO _x , H ₂ S, aldehydes, alkyl mercaptans, sulfides, methacrylate monomers, smoke and irritating vapours as products of incomplete combustion.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Based on toxicity of components. Acute oral toxicity (LD50): >5000 mg/kg (rat). Acute dermal toxicity (LD50): >2000 mg/kg (rabbit). Acute inhalation toxicity (LC50): >2500 mg/m ³ /4h (rat).
Chronic or Other Toxic Effects	
Dermal Route:	Prolonged or repeated contact may cause skin irritation characterized by dermatitis or oil acne.
Inhalation Route:	Negligible breathing hazard at normal temperatures (up to 38°C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists or fumes. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.
Oral Route:	Low toxicity; has laxative effect.
Eye Irritation/Inflammation:	Repeated or prolonged contact may cause transient irritation, but no permanent damage.
Immunotoxicity:	Not available.
Skin Sensitization:	This product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.
Respiratory Tract Sensitization:	This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.
Mutagenic:	Based on actual test results of base oils and results of similar products, severely hydrotreated base oils give negative results when tested for: (a) Salmonella Typhimurium TA98 using the Modified Ames Assay for Petroleum Product; (b) Salmonella-Escherichia coli/Mammalian-Microsome Reverse Mutation Assay (Ames test) with a Confirmatory Assay; (c) Structural Chromosomal Aberrations in Chinese Hamster Ovary (CHO) Cells.
Reproductive Toxicity:	This product is not expected to be a reproductive hazard, based on the available data and the known hazards of the components.
Teratogenicity/Embryotoxicity:	This product is not expected to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.
Carcinogenicity (ACGIH):	This product is not known to contain any chemicals at reportable quantities that are listed as A1 or A2 carcinogens by ACGIH.
Carcinogenicity (IARC):	This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.
Carcinogenicity (NTP):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS):	Not available.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	All components listed in Annex 1 to which Note L applies, and contained in the product, have been shown to contain less than 3% DMSO extractables as measured by IP346.

Section 12. Ecological Information

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


Section 13. Disposal Considerations

Waste Disposal	Spent/used/waste oil may meet the requirements of a hazardous waste. Consult your local or regional authorities. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.
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Section 14. Transport Information

TDG Classification	Not controlled under TDG (Canada).	Special Provisions for Transport	Not applicable.
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Section 15. Regulatory Information

Other Regulations		<p>This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).</p> <p>All components of this formulation are listed on the US EPA-TSCA Inventory.</p> <p>All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).</p> <p>This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.</p> <p>Please contact Product Safety for more information.</p>																					
DSD/DPD (Europe)	Not classified under the Dangerous Substances or Dangerous Preparations Directives.	HCS (U.S.A.)	Not controlled under the HCS (United States).																				
ADR (Europe) (Pictograms)	<p>NOT EVALUATED FOR EUROPEAN TRANSPORT</p> <p>NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.</p>	DOT (U.S.A) (Pictograms)																					
HMIS (U.S.A.)	<table border="1"> <tr> <td>Health Hazard</td> <td>(1)</td> </tr> <tr> <td>Fire Hazard</td> <td>(1)</td> </tr> <tr> <td>Reactivity</td> <td>(0)</td> </tr> <tr> <td>Personal Protection</td> <td>(B)</td> </tr> </table>	Health Hazard	(1)	Fire Hazard	(1)	Reactivity	(0)	Personal Protection	(B)	NFPA (U.S.A.)	<table border="1"> <tr> <td>Health</td> <td>0</td> <td>Fire Hazard</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>Reactivity</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>Specific hazard</td> <td></td> </tr> </table>	Health	0	Fire Hazard	0			Reactivity	0			Specific hazard	
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		Reactivity	0																				
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		Rating	<p>0 Insignificant</p> <p>1 Slight</p> <p>2 Moderate</p> <p>3 High</p> <p>4 Extreme</p>																				

Section 16. Other Information

References	<p>Available upon request.</p> <p>* Marque de commerce de Petro-Canada - Trademark</p>
Glossary	<p>ACGIH - American Conference of Governmental Industrial Hygienists</p> <p>ADR - Agreement on Dangerous goods by Road (Europe)</p> <p>ASTM - American Society for Testing and Materials</p> <p>BOD5 - Biological Oxygen Demand in 5 days</p> <p>CAN/CGA B149.2 - Propane Installation Code</p> <p>CAS - Chemical Abstract Services</p> <p>CEPA - Canadian Environmental Protection Act</p> <p>CERCLA - Comprehensive Environmental Response, Compensation and Liability Act</p> <p>CFR - Code of Federal Regulations</p> <p>CHIP - Chemicals Hazard Information and Packaging Approved Supply List</p> <p>COD5 - Chemical Oxygen Demand in 5 days</p> <p>CPR - Controlled Products Regulations</p> <p>DOT - Department of Transport</p> <p>DSCCL - Dangerous Substances Classification and Labeling (Europe)</p> <p>DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)</p> <p>DSL - Domestic Substance List</p> <p>EEC/EU - European Economic Community/European Union</p> <p>EINECS - European Inventory of Existing Commercial Chemical Substances</p> <p>EPCRA - Emergency Planning and Community Right to Know Act</p> <p>FDA - Food and Drug Administration</p> <p>FIFRA - Federal Insecticide, Fungicide and Rodenticide Act</p> <p>HCS - Hazardous Communication System</p> <p>HMIS - Hazardous Material Information System</p> <p>IARC - International Agency for Research on Cancer</p> <p>IRIS - Integrated Risk Information System</p> <p>LD50/LC50 - Lethal Dose/Concentration kill 50%</p> <p>LDLo/LCLo - Lowest Published Lethal Dose/Concentration</p> <p>NAERG'96 - North American Emergency Response Guide Book (1996)</p> <p>NFPA - National Fire Prevention Association</p> <p>NIOSH - National Institute for Occupational Safety & Health</p> <p>NPRI - National Pollutant Release Inventory</p> <p>NSNR - New Substances Notification Regulations (Canada)</p> <p>NTP - National Toxicology Program</p> <p>OSHA - Occupational Safety & Health Administration</p> <p>PEL - Permissible Exposure Limit</p> <p>RCRA - Resource Conservation and Recovery Act</p> <p>SARA - Superfund Amendments and Reorganization Act</p> <p>SD - Single Dose</p> <p>STEL - Short Term Exposure Limit (15 minutes)</p> <p>TDG - Transportation Dangerous Goods (Canada)</p> <p>TDLo/TCLo - Lowest Published Toxic Dose/Concentration</p> <p>TLm - Median Tolerance Limit</p> <p>TLV-TWA - Threshold Limit Value-Time Weighted Average</p> <p>TSCA - Toxic Substances Control Act</p> <p>USEPA - United States Environmental Protection Agency</p> <p>USP - United States Pharmacopoeia</p> <p>WHMIS - Workplace Hazardous Material Information System</p>
For Copy of MSDS	<p>Internet: www.petro-canada.ca</p> <p>Lubricants: Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564 Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285 Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285</p>
	<p>Prepared by Product Safety - JDW on 8/9/2002.</p> <p>Data entry by Product Safety - JDW.</p>
For Product Safety Information:	(905) 804-4752

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



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

1 PRODUCT AND COMPANY IDENTIFICATION

Additives Experimental
2000 Market Street
28th Floor
Philadelphia, PA 19103-3222

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service Number	(800) 331-7654	8:00 AM - 5:00 PM

Product Name WASTE OCTYL SOLVENT
Product Synonym(s)

Chemical Family
Chemical Formula
Chemical Name
EPA Reg Num
Product Use Waste

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical %	OSHA
Octene	25377-83-7	36-48% By Wt.	Y
Dibutyl ether	142-96-1	15-30% By Wt.	Y
Heptane, 3-methylene-	1632-16-2	9-12% By Wt.	Y
Butane	106-97-8	4-8% By Wt.	Y
1-Butanol	71-36-3	2-4% By Wt.	Y
Hydrochloric acid	7647-01-0	0.25-1% By Wt.	Y
Unidentified organotins	NE	0.1-2% By Wt.	Y
Water	7732-18-5	0.5-2% By Wt.	N

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview
Clear liquid with solvent odor

DANGER!
CAUSES EYE AND SKIN BURNS. MAY CAUSE BLINDNESS.
CAN CAUSE RESPIRATORY TRACT IRRITATION
PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION.

Potential Health Effects



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Based on its composition, it is anticipated to be highly to moderately toxic if swallowed and moderately toxic if absorbed through skin or inhaled and corrosive to eyes and skin. If swallowed, this material may cause severe irritation and injury characterized by pain in the mouth, throat and stomach, and difficulty in swallowing. Prolonged or repeated contact may remove oils from the skin and may dry skin and cause irritation, redness and rash. High vapor concentrations may be irritating to the eyes and respiratory tract, and may result in central nervous system (CNS) effects such as headache, dizziness, nausea, drowsiness, and in severe exposures, loss of consciousness and death. Mild to severe lung injury may occur if this material is drawn into the lungs (aspirated) during swallowing, or during vomiting after swallowing. Symptoms of injury may include increased breathing and heart rate, coughing and related signs of respiratory distress. Medical conditions that may be aggravated by exposure to this material include lung disease or limited respiratory capacity.

4 FIRST AID MEASURES

GENERIC FIRST AID, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, induce vomiting immediately as directed by medical personnel. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	NA	
Flash Point	< 73 Deg F	Flash Point Method
Flammable Limits- Upper	NA	
Lower	NA	

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fight fire with large amounts of water from a safe distance. Use water spray to cool containers exposed to fire. Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use. After a fire, wait until the material has cooled to room temperature before initiating clean up activities.

Fire and Explosion Hazards

When burned, the following hazardous products of combustion can occur:
Carbon monoxide
Carbon dioxide

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Ventilate the area. Contain spill by building a dike using absorbent material. Consult with environmental



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

6 ACCIDENTAL RELEASE MEASURES

engineer or professional to determine if neutralization is appropriate and for handling procedures for residual materials. Do not use solid bleach for neutralization, as fire or violent reaction can occur. Collect the liquid and solid absorbent into a drum approved for waste disposal. Flush area with water. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Do not get in eyes, on skin or clothing. Wash thoroughly after handling.

Keep container closed.

Use only with adequate ventilation.

CONTAINER HAZARDOUS WHEN EMPTY. Emptied container retains vapor and product residue. Follow labeled warnings even after container is emptied. RESIDUAL VAPORS MAY EXPLODE ON IGNITION. DO NOT CUT, DRILL GRIND OR WELD ON OR NEAR THIS CONTAINER. Improper disposal or reuse of this container may be dangerous and/or illegal.

Storage

Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly rated, grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate and create a fire hazard. All storage containers, including containers such as drums, cylinders and IBC's, must be bonded and grounded during filling and emptying operations. Store away from oxidizers and reactive materials. Keep container tightly closed. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes which pertain to the specific local conditions of storage and use, including OSHA 29 CFR 1910.106 and NFPA 30, 70, 77, and 497.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Eye / Face Protection

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Engineering Controls

Investigate engineering techniques to reduce exposures. Provide ventilation if necessary to minimize exposures. If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Respiratory Protection

Avoid breathing vapor or mist. Where airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. If exposures cannot be



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

kept at a minimum with engineering controls, consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit		Value
1-Butanol		
ACGIH TWA	-	20 ppm
OSHA TWA PEL	-	100 ppm (300 mg/m ³)
Hydrochloric acid		
ACGIH CEILING	-	2 ppm
OSHA Ceiling PEL	-	5 ppm 7 mg/m ³
Unidentified organotins		
ACGIH Skin designator	-	Y
ACGIH STEL	-Organic tin compounds, as Sn	0.2 mg/m ³
ACGIH TWA	-Organic tin compounds, as Sn	0.1 mg/m ³
OSHA TWA PEL	-Organic tin compounds, as Sn	0.1 mg/m ³
Butane		
ACGIH TWA	-As Aliphatic Hydrocarbon Gases: Alkane [C1-C4]	1000 PPM

-Only those components with exposure limits are printed in this section.

-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.

-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Clear liquid with solvent odor
pH	< 3
Specific Gravity	NE
Vapor Pressure	NE
Vapor Density	NE
Melting Point	NA
Freezing Point	NE
Boiling Point	NE
Solubility In Water	NE



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Hazardous Polymerization

Does not occur.

Incompatibility

None Known.

Hazardous Decomposition Products

When burned, the following hazardous products of combustion can occur:

Carbon monoxide

Carbon dioxide

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

1-Hexene

Single exposure (acute) studies indicate that this material is moderately toxic to rats when inhaled, slightly irritating to rabbit eyes and moderately irritating to rabbit skin.

Butane

Single exposure (acute) studies indicate that this material is practically non-toxic to rats (4-hour LC50 658 mg/l), mice (2-hour LC50 680 mg/l), and dogs (LC50 474-592 mg/l), non-irritating to rabbit eyes and moderately irritating to rabbit skin. A 10-minute exposure at 10,000 ppm (1%) butane gas results in drowsiness, but no other evidence of systemic effects. Butane is characterized by its narcosis-producing potential at high exposure levels. Sudden death may occur when n-butane is inhaled at high concentrations. Chronic exposure to n-butane has been reported to cause some symptoms in the central nervous system. n-Butane is reported to be a weak cardiac sensitizer in the dog.

1-Butanol

Single exposure (acute) studies indicate that this material is slightly toxic if swallowed (rat LD50 700-2,510 mg/kg), practically non-toxic to slightly toxic if absorbed through skin (rabbit LD50 3,400-5,300 mg/kg), practically non-toxic if inhaled (rat 4-hr LC50 24.6 mg/l), severely irritating to rabbit eyes and moderately irritating to rabbit skin (24-hr exposure). Acute oral administration or inhalation by rats and mice produced irritation and narcosis. In repeat inhalation studies (guinea pigs, rats), this material produced changes in lung, kidney and liver, narcosis and blood cell effects. Following repeated oral dosing, reduced activity and loss of coordination were observed in rats. A slight increase in skeletal defects was observed in the offspring of rats exposed by inhalation during pregnancy at a level which produced adverse effects on the mother and reduced fetal weights. No genetic changes were observed in tests using bacteria and animal or human cells.

Hydrochloric Acid (HCl)

Single exposure (acute) studies indicate that this material is slightly toxic if swallowed (rat LD50 700 mg/kg) or inhaled (rat 4-hr LC50 4.66 mg/l), practically non-toxic if absorbed through skin (rabbit LD50 >5,010 mg/kg) and corrosive to rabbit eyes and skin. Repeated inhalation produced irritation and decreased liver and body weights in laboratory animals. Lifetime inhalation in rats did not produce lung tumors. No genetics changes were observed in tests using bacteria. Both positive and negative responses were observed in tests using animal cells.

Organotin Stabilizers



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

11 TOXICOLOGICAL INFORMATION

Single exposure (acute) studies indicate that this material is moderately to highly toxic if swallowed (rat LD50s ranging from 8.5-224 mg/kg), moderately toxic if absorbed through skin (rabbit LD50s around 500 mg/kg) or inhaled (rat 1-hr LC50s ranging from 0.2-0.4 mg/l), and severely irritating or corrosive to rabbit eyes and skin. Certain organotin compounds are recognized as potent human and animal neurotoxins. The area of the brain affected is associated with emotions (like rage and fear), learning and memory. Similar to the effects reported in humans, this material has also been reported to produce high frequency hearing loss with morphological changes in rats and guinea pigs after acute exposure. Repeated and long-term animal studies involving organotin compounds have generally shown effects on the immune system (primarily the thymus) following oral and inhalation exposure. Other effects noted include inflammation of the lungs, effects on the liver and kidney, depression of the immune system and mild anemia. Birth defects and other adverse effects have been observed in the offspring of rats following oral exposure during pregnancy. Both positive and negative responses have been observed in genetic tests using bacteria, animal cells or animals.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Dibutyl Ether

This material is slightly toxic to *Daphnia magna* (48-hr LC50 26 mg/l), fathead minnow (96-hr LC50 32.3 mg/l) and killifish (48-hr LC50 30.7 mg/l). It is practically non-toxic to sheepshead minnow (96-hr LC50 >430 ppm).

Butane

This material inhibits the growth of some bacteria, mold, fungi, and plant seeds. It also inhibits enzymatic lysis of bacterial spores.

1-Butanol

This material is practically non-toxic to brine shrimp (24-hr LC50 2,950 mg/l), creek club (24-hr LC50 1,900-2,300 mg/l), goldfish (24-hr LC50 1,900 mg/l), *Daphnia magna* (24-hr LC50 1,880 mg/l; 48-hr EC50 1,983 mg/l), clawed toad (48-hr LC50 1,200 mg/l), golden orfe (48-hr LC50 1,200 mg/l), fathead minnow (96-hr LC50 1,730-1,910 mg/l), bleak (96-hr LC50 2,250-2,400 mg/l) and harpacticoid copepod (96-hr LC50 1,900-2,300 mg/l). The 8-day no observable effect levels for green algae and blue-green algae are 875 and 100 mg/l, respectively.

Organotin Stabilizers

Organotin compounds are generally highly toxic to aquatic organisms: *Daphnia magna* (24-hr EC50 0.47 mg/l; 48-hr LC50 0.87 mg/l); golden orfe (48-hr LC50 1 mg/l); guppy and rainbow trout (LC50 0.02-0.021 mg/l); oysters, shrimp and copepod (LC50 0.006-0.004 mg/l); sheepshead minnow, Atlantic silverside, mummichog and Atlantic menhaden (LC50 0.0045-0.026 mg/l); and algae (72-hr LC50 >0.5 mg/l). One organotin compound has an EC50 in a 21-day life-cycle test with *Daphnia magna* of 70 ppb. In a 110-day early life-stage study with rainbow trout the NOEL for this organotin compounds was 40 ppb.

Chemical Fate Information

Data on this material and/or its components are summarized below.

Dibutyl Ether

This material has a log Pow of 3.08, a 28-day BOD of 3% and a BCF of 47-83 in carp.

1-Butanol

This material is readily biodegradable (98% after 19-days). It is slightly adsorptive in soil and sediment (log Koc 1.85) and practically not bioaccumulable (log Pow 0.88). It has a half-life of 22.6 hours in air.

Organotin Stabilizers

Some organotin compounds have been reported to bioaccumulate with factors up to 10,000 for marine fish and



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

12 ECOLOGICAL INFORMATION

marine shellfish. Organotin compounds are poorly biodegraded and rates of hydrolysis and photolysis are low. Organotin compounds also readily absorb to soils and sediments and do not leach through soil columns.

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Recover, reclaim or recycle when practical.

Disposal via incineration is recommended. Appropriate pretreatment and disposal in an authorized landfill is acceptable. In all cases, dispose of material in accordance with all applicable federal, state, and local laws and regulations. Consult appropriate regulatory officials or your attorney for information on such disposal.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Flammable Liquid, Corrosive, n.o.s.
DOT Technical Name	(Butanol, Hydrochloric acid)
DOT Hazard Class	3,8
UN Number	UN2924
DOT Packing Group	PG II
RQ	See Below
DOT Special Information	RQ - Butanol = 5000 lbs. Hydrochloric acid = 5000 lbs.

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	Y
Delayed (Chronic) Health	Y	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
1-Butanol	5000 LBS	
Hydrochloric acid	5000 LBS	500 LBS
Water	NE	
Dibutyl ether	100 LBS	
Octene	NE	NE
Heptane, 3-methylene-	NE	NE
Butane	NE	NE



WASTE OCTYL SOLVENT

Material Safety Data Sheet

Arkema Inc.

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

1-Butanol

Hydrochloric acid

SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremely Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Hydrochloric acid

DEA - precursor element

This product does contain the following chemical(s), as indicated below, currently on the DEA Final Precursors and Essential Chemicals Listed Components list.

Hydrochloric acid

Massachusetts Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

1-Butanol

Butane

Dibutyl ether

Hydrochloric acid

Octene

New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

1-Butanol

Butane

Dibutyl ether

Hydrochloric acid

Pennsylvania Environmental Hazard

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

1-Butanol

Hydrochloric acid

Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

1-Butanol

Butane

Dibutyl ether

Hydrochloric acid

16 OTHER INFORMATION

Revision Information

Revision Date 25 FEB 2005 Revision Number 1

Supersedes Revision Dated

Revision Summary

New Waste material

Key

NE= Not Established NA= Not Applicable (R) = Registered Trademark



WASTE OCTYL SOLVENT

Material Safety Data Sheet

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