Environmental Management Plan

Kununurra to Darwin Waste Transport

Mclean Enterprises

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RELIANCE, USES and LIMITATIONS

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1 INTRODUCTION

1.1 Objectives

This Environmental Management Plan (EMP) sets out the environmental management of listed waste transport operations run by McLean Enterprises Pty Ltd (MLE) between Kununurra in Western Australia (WA) and Darwin in the Northern Territory (NT). This EMP identifies the environmental risks associated with waste transport operations and outlines specific objectives and targets for minimising the potential for environmental harm. It outlines the context of the legislative requirements and the roles and responsibilities of MLE personnel for environmental management. This EMP should be treated as a dynamic document subject to annual review, updating and improvement, and forms the basis for environmental auditing.

1.2 Contact details and responsibilities

Business Name:	McLean Enterprises Pty Ltd
Entity Name:	McLean Enterprises Pty Ltd
ABN:	86071474541
Business Address:	24 Ivanhoe Rd, Kununurra WA 6743
Postal Address	PO Box 364, Kununurra WA 6743
Phone No. (business hours)	08 9169 1088
Darwin Premises	156 Winnellie Road, Winnellie NT 0820
Director:	Andrew McLean
Phone No.	0409 104 563
Email:	mclean.ent2@westnet.com.au
Emergency Contacts	
Operations Manager WA:	John McLean
Phone No.	0438 691 088
Operations Manager NT:	Nelson McLean
Phone No.	0408 691 088

1.3 Environment Protection Licence

As a commercial operation transporting listed wastes, MLE requires an Environment Protection Licence (EPL) under Schedule 2 of the NT *Waste Management and Pollution Control Act*. The EPL outlines a number of conditions MLE must meet in order to be compliant and is administered by the NT Environment Protection Authority (NT EPA).

1.4 Legal and other obligations

In regard to the environment, activities undertaken by MLE are governed by a range of Commonwealth and Northern Territory legislation, policies, and guidelines, which include (but not limited to) the following:

- *Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)*
- *Bushfires Act*
- *Dangerous Goods Act*
- *Dangerous Goods (Storage and Handling) Regulations 2000 (NT)*
- *Environmental Offences and Penalties Act*

- *Litter Act*
- *National Environment Protection Council (NT) Act*
- *Public and Environmental Health Act*
- *Public Health (General Sanitation, Mosquito Prevention, Rat Exclusion and Prevention) Regulations*
- *Road Transport Reform (Dangerous Goods) Act 1995 (Cwlth)*
- *Soil Conservation and Land Utilisation Act*
- *Territory Parks and Wildlife Conservation Act*
- *Waste Management and Pollution Control Act*
- *Water Act*
- *Workplace Health and Safety Act and Regulations*
- *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*

2 WASTE REMOVAL OPERATIONS

Waste removal operations include the transport via road train of used tyres, batteries, and waste oil, which are classified as 'listed waste' types under the NT *Waste Management and Pollution Control Act*. These wastes are collected from various sites in Kununurra WA and transported to licensed storage or disposal sites in Darwin NT. Tyres and batteries are manually, or machine handled during loading and offloading. The waste oil is contained in IBCs.

2.1 Waste collection

Waste material to be collected from clients in Kununurra are either hazardous or non-hazardous substances - classified according to the criteria of *the 4th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals, Non-Dangerous Goods according to the criteria of ADG*. These are summarised below in Table 2-1, with further detail provided in each substance Safety Data Sheet (SDS) in Appendix A.

Table 2-1. Summary of listed wastes to be transported between Kununurra and Darwin

Product name	Classification	Specific handling and storage requirements	Transport information
Battery fluid, acid or Sulfuric acid with not more than 51 percent acid	Hazardous	Store away from alkalis and oxidisers	UN number: 2796 Transport Hazard Class: 8 Packing Group: II HazChem Code: 2R
Batteries, wet, filled with acid, electric storage		Pack according to ADGC P801 Packing Instructions	UN number: 2794 Transport Hazard Class: 8 Packing Group: NA HazChem Code: NA
Tyres	Non-hazardous		UN number: NA Transport Hazard Class: NA Packing Group: NA HazChem Code: NA
Waste oil	Non-hazardous		UN number: 30XY Transport Hazard Class: NA Packing Group: NA HazChem Code: NA

2.2 Volumes

The approximate waste volumes to be transported per year are detailed in Table 2-2. The licenced facility in Darwin where wastes are to be delivered is also listed.

Table 2-2. Approximate waste volumes transported per year and its destination in Darwin

Waste Type	Estimated total quantity per year	Destination
Batteries	200,000 kg	Sell & Parker Metal Recycling Services Pty Ltd 55/61 McKinnon Rd, Pinelands NT 0828

Tyres	20,000 kg	Top End Tyre Recycling Pty Ltd 12 Spencely Rd, Humpty Doo NT 0836
Waste oil	50,000 L	Veolia Pty Ltd 13 Beaton Road Berrimah NT 0828

2.3 Handling

When handling dangerous goods, personnel must ensure as far as practicable that the goods are handled in accordance with good industrial hygiene and safety practice, in a manner that will not cause harm to a person or damage to property (including the pallets / bins themselves). Personnel must use appropriate PPE; avoid contact with skin, eyes, and clothing; wash hands after use; avoid creating/inhaling dust; and ensure there is adequate ventilation. Any additional requirements for handling specific materials are listed in Table 2-1.

2.4 Transport

Transport will be conducted according to *Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Regulations 2011*, which is intended to:

- Set out the obligations of persons involved in the transport of dangerous goods on land
- Reduce, as far as practicable, the risks of personal injury, death, property damage and environmental harm arising from the transport of dangerous goods on land
- Give effect to the standards, requirements and procedures of the Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition) so far as they apply to the transport of dangerous goods on land
- Promote consistency between the standards, requirements and procedures applying to the transport of dangerous goods by land transport and other modes of transport.

2.5 Storage

Occasionally, if trucks arrive in Darwin after business hours, the truck, which still contains the waste consignment in its trailer, may need to park overnight at the MLE premises at 156 Winnellie Road, Winnellie. The waste would be dispatched to the appropriate licenced waste facility immediately the following morning.

The MLE premises in Winnellie is zoned as General Industry.

2.6 Documentation

The consigner must carry documentation for the dangerous goods that comply with Chapter 11.1 of the *ADG Code*. Documentation must contain:

- The consignor's name and telephone number
- A description of the dangerous goods in accordance with 11.1.2.2 of the *ADG Code:*
    - The UN number of the goods
    - The proper shipping name of the goods or name of the good that appears on the packaging, article or receptacle in which it is contained
    - The Class or Division of the goods
    - Each Subsidiary Hazard (if any)
    - A description of each type of package or other receptacle to be transported, i.e. "IBC"

- The number of packages or receptacles of each type to be transported
- The aggregate quantity of the goods.

2.7 Vehicles and equipment

Transport operations will use trucks and/or trailers that comply with safety standards defined in Chapter 4.4 of the *ADG Code.* In general, the vehicles must:

- Be suitable for the transport of dangerous goods
- Be free from any defect that is likely to create risk in transporting the goods
- Be clean
- Be fitted with twistlocks or other equipment for securing the containers.

Any equipment that is on the vehicle and that is used in loading/unloading the dangerous goods on/off the vehicle must be suitable for that purpose and be free of any defect that is likely to increase the risk in loading or unloading the goods.

3 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) has been developed to identify key sources, pathways and receptors of potential contaminants and include the following considerations:

- Potential contaminants
- Inferred sources
- Pathways and mechanisms for transport
- Potential sensitive receptors.

3.1 Potential contaminants

The potential contaminants of concern that may be present during transport operations include:

- Caustic chemicals, acids and metals used in battery construction
- Tyres
- Waste oil
- Weeds

3.2 Contaminant sources

Sources of potential contaminants include the transport of listed waste materials from various sites in Kununurra along roadways to licensed waste storage and/or disposal facilities in Darwin.

Weed seeds and/or vegetative material may be picked-up by transport vehicles and taken to areas where these weeds do not yet exist.

3.3 Pathways and transport

Uncontrolled discharges to surface waters, and vertical migration through watercourses and soil into groundwater as a result of a spill.

Accidental fire leading to smoke emissions and potential airborne chemical particles.

3.4 Receptors

Potential receptors comprise environments along the transport route between the Kununurra and Darwin. If a spill was to occur, depending on where along the route it occurred, the receiving environments may include roadside flora and fauna habitats, surface waterways, groundwater, and/or roadside residences/properties. Potential receptors affected by discharges from a spill associated with these environments would include terrestrial and aquatic flora and fauna, domestic livestock and/or human health.

Similarly for weeds, the receptor would depend on where weed seeds/vegetative material became dislodged from the vehicle and entered the environment.

4 ENVIRONMENTAL RISK ASSESSMENT

The potential environmental risks associated with operational activities have been assessed. The likelihood and consequence categories adopted in the aspects and impacts register are provided in Table 4-1 and Table 4-2, and have been combined to derive an overall risk rating using the matrix in Table 4-3. The environmental risk assessment table is included as Table 4-4.

Table 4-1. Likelihood categories

Categories	Score	Likelihood Description
Remote	1	Never heard of, but not impossible
Rare	2	Highly unlikely; will only occur in exception circumstances
Unlikely	3	Could occur at some time, but unlikely
Moderate	4	Might occur at some stage; has previously occurred
Likely	5	Known to occur or will probably occur; has occurred several times
Almost certain	6	Common or repeating occurrence; is expected to occur in most circumstances

Table 4-2. Consequence categories

Categories	Score	Consequence Description
Negligible	0	No/low measurable impact on the environment
Minor	1	Some, minor, temporary environmental impact
Moderate	2	Contained temporary, or permanent minor, localised environmental damage
Severe	3	Wider and longer-term environmental impacts
Major	4	Very serious impact with long-term environmental damage
Catastrophic	5	Environmental disaster

Table 4-3. Risk matrix

		Consequence					
		0	**1**	**2**	**3**	**4**	**5**
Likelihood	**6**	Negligible (0)	Low (6)	Moderate (12)	High (18)	Extreme (24)	Extreme (30)
	5	Negligible (0)	Low (5)	Moderate (10)	High (15)	Extreme (20)	Extreme (25)
	4	Negligible (0)	Low (4)	Moderate (8)	Moderate (12)	High (16)	Extreme (20)
	3	Negligible (0)	Low (3)	Low (6)	Moderate (9)	Moderate (12)	High (15)
	2	Negligible (0)	Low (2)	Low (4)	Low (6)	Moderate (8)	Moderate (10)
	1	Negligible (0)	Low (1)	Low (2)	Low (3)	Low (4)	Low (5)

Table 4-4. Environmental risk assessment

Aspect	Potential impact	Initial risk			Management and mitigation controls (overview)	Residual risk		
		L/hood	Cons	Risk		L/hood	Cons	Risk
Fire on transport vehicle	Waste containing flammable and combustible material and the increased risk of starting a fire – leading to damage of vehicle and surrounding environment	3	3	**Mod (9)**	• Emergency response plan and procedures in place • Appropriate firefighting equipment kept and maintained in vehicles • Appropriate hazardous substance storage and handling procedures in place	2	2	**Low (4)**
Spills of dangerous goods or hazardous substances	Unsafe handing or transport operations causing contamination of soils, land, surface water and/or groundwater in receiving environment	3	2	**Low (6)**	• Training and site inductions provided to all employees • Inspect condition of batteries upon collection • Only collect batteries that are undamaged • Appropriate hazardous substance handling, storage and transport procedures • Spill kits will be onsite and in vehicles, adequately sized and stocked to respond to a spill if required • Following the 3 C's (contain, communicate, clean-up)	2	1	**Low (2)**
Movement of vehicles and equipment	Spread of weeds	3	2	**Low (6)**	• All vehicles washed down upon entry to depot and weed hygiene inspections undertaken • All vehicles to remain on designated tracks during operation • Regular inspections of depot for weed occurrence • Regular control of weeds by herbicide spraying • Regular slashing	2	1	**Low (2)**

5 ENVIRONMENTAL MANAGEMENT

This EMP provides a consolidated plan for environmental management to mitigate the environmental risks identified in Section 4. Table 5-1 identifies the potential impacts of transport operations on the environment and includes environmental objectives, management and mitigation measures, performance criteria and target indicators, corrective actions and contingencies, monitoring and reporting and record-keeping mechanisms for each aspect.

5.1 Table of provisions

Table 5-1. Environmental management summary

Aspect	POTENTIAL IMPACT	OBJECTIVE / OUTCOME	MANAGEMENT ACTION	TARGET / PERFORMANCE INDICATOR	MONITORING	Corrective actions and contingencies	Reporting and record-keeping
Transport and handling of dangerous goods and tyres	• Spills of hazardous substances • Contamination of land, soil, surface and/or groundwater	No contamination of land, soil, surface water or ground water as a result of hazardous substance spill or poor-handling	• Batteries packed for transport in accordance with P801 Packing Instructions (ADGC) • Training and induction provided to all employees • Appropriate spill kits kept in vehicles, and stocked	• No indication of spills of hazardous substances • Any spill of stored product is contained and remediated through the spill response procedure.	Regular inspection of waste transport vessel prior to and during transport	• Review storage and handling practices • Increase the number, capacity or type of spill kit materials	• Incident reporting records • Reporting through Annual return • Chemical and SDS register maintained
	• Transport of flammable and combustible waste increasing fire risk - leading to damage of vehicle and surrounding environment	No fire caused by transport operations	• Emergency response plan and procedures in place • Appropriate firefighting equipment kept and maintained in vehicles	• No fires started within transport vehicles	Regular inspection of waste materials and firefighting equipment	• Review hazardous substance storage practices (on vehicle) • Increase number or type of firefighting equipment available • Review emergency response plans	• Inspection records • Incident reporting records
Movement of vehicles and equipment	Spread of weeds	• To prevent spread of established weeds off transport sites • To prevent introduction of new weed species to transport sites	• Inspections of vehicles for weed hygiene compliance • Vehicles cleaned of any plant material and other organic matter in designated washdown area at depot and/or purpose-built facility	• No increase in the distribution of existing weed species • No introduction of new weed species	Regular weed outbreak inspections Inspections of vehicles returning to depot	Review weed control activities and frequency	• Inspection records • Incident reporting records

5.2 Roles and responsibility

Unless otherwise specified, the Director is responsible for ensuring that MLE is operating under the conditions in the EPL, and that this EMP is being implemented effectively, to ensure no environmental harm is being done.

Employees of MLE must adhere to all conditions in the EPL and requirements of this EMP.

5.3 Inductions and communication

All project personnel, subcontractors and consultants will be required to undertake an induction, which will include details on the EPL and this EMP.

MLE staff will hold regular meetings to discuss any concerns regarding the MLE operations. The Director is to report any incidents to the NT EPA as soon as possible, within 24 hours of the incident occurring.

5.4 Stakeholder consultation

External stakeholders relevant to this EMP and waste transport operations include:

- Waste generating sites engaging MLE services
- Listed waste storage and/or disposal sites
- NT EPA (as regulator and compliance monitoring of EPL)

Consultation with stakeholders is undertaken directly through written (letters, emails) or verbal communication (meetings, phone calls).

5.5 Complaints register

MLE will keep a complaints register that details the reason/type of complaint and mitigation measures put in place if required. The complaints register will record the following details:

- Date and time of complaint
- Method by which complaint was made (i.e. telephone, letter, meeting, etc.)
- Name, address, contact telephone number of complainant
- Details of complaint
- Action taken in response to the complaint, including follow up contract with the complainant
- Any monitoring to confirm the complaint has been satisfactorily resolved
- If no action was taken, the reason for no action being taken.

5.6 Inspections, audits and reporting

5.6.1 Inspections and audits

Inspection of waste material for transport and inspections of the transport vehicles are to be undertaken by the vehicle operator. Visual inspections will cover all environmental aspects as outlined in this EMP as an operational requirement and are not documented.

MLE will arrange for a transport audit to be undertaken on an annual basis, to evaluate the extent to which compliance has been achieved with the EPL.

5.6.2 Non-conformance and corrective actions

Where an inspection or audit identifies non-conformances, corrective or preventative actions that need to be addressed, these will be recorded in an action register and issued to the responsible person for rectification. The action register will detail the non-conformances, identified actions, responsible persons and due date for completion.

Non-compliance with the EPL will be managed as per Section 5.6.3 and 5.7.

5.6.3 Incidents

All environmental incidents, near-misses or EPL non-compliances must be reported to MLE as soon as practicable. Reports can be made verbally but must be followed up with a written report. Incident reports must contain the following information:

- Date, time and circumstance under which the incident became known
- Known or estimated dates and times at which the incident commenced and ended
- Details of the person initially reporting the incident
- Actual and potential causes and contributing factors to the incident
- Risk of environmental harm arising from the incident
- Actions that have or will be undertaken to mitigate any environmental harm
- Corrective actions that have or will be undertaken to prevent the incident happening again
- If no action was taken, why no action was taken

Depending on the area and severity of the incident, testing of soils and/or surface water for contamination may be necessary. This should be conducted upon advice from the NT EPA or other relevant environmental authority.

MLE will investigate each incident in order to discover the cause(s) of the incident and implement improvements and training in order to prevent a repeat incident.

A record of all environmental incidents, near-misses and EPL non-compliances will be maintained in an environmental incident register and reported to the NT EPA, if required.

5.7 Reporting and review

5.7.1 Internal

This EMP is a working document and will be updated when required. The EMP will also be reviewed at least annually by the anniversary date of the EPL.

Details of environmental incidents, non-conformances or other relevant information (including results from soil and/or water sampling, if required) are included in monthly reports which are issued to the MLE Director. Records of all incidents, inspections and reports are maintained through an electronic filing system.

5.7.2 External

MLE will report any non-compliance with the EPL by completing a Non-Compliance Notification via the NT EPA website as soon as practicable after (and in any case within 24 hours after) first becoming aware of the event.

An Annual Return will be submitted to the NT EPA on the anniversary date of the EPL to summarise the activities and outcomes of the previous 12 months, and an assessment of any environmental impacts from the MLE operations.

6 EMERGENCY RESPONSE PLAN

Emergency response planning includes responses to environmental emergencies, and operational actions that cause an environmental incident. This Emergency Response Plan outlines the environmental emergency risks, emergency preparedness, mitigation and reporting requirements specifically relating to environmental incidents for MLE.

6.1 Emergency incidents

Emergency incidents that may occur within MLE include:

- **Extreme weather event** resulting in damage to MLE facilities
- **Lightning strike** that may impact on waste transport or storage operations, or even ignite dangerous goods
- **Fuel or chemical spill** that may contaminate water or soils
- **Fire** as a result of bushfire or accidental fire as a result of operations.

6.2 Emergency contacts

The Operations Manager is the contact person for all emergencies and environmental incidents. All incidents which cause or have the potential to cause material or serious environmental harm, will be reported to the NT EPA within 24 hours as required under Section 14 of the NT *Waste Management and Pollution Control Act*.

The details of the designated contact persons responsible for on-site environmental management are included in Table 6-1. Also included are emergency contacts for reporting pollution incidents (including non-urgent problems such as dust/noise) and contacts for provision of advice.

Table 6-1. Emergency contact details

Contact	Details
Operations Manager (NT)	Nelson McLean Mobile 0408 691088 Email mclean.ent@westnet.com.au
Operations Manager (WA)	John McLean Mobile 0438 691088 Email mclean.ent@westnet.com.au
NT EPA Pollution Hotline / Pollution Reporting	GPO Box 3675, Darwin NT, 0801 Pollution Hotline: 1800 064 567 pollution@nt.gov.au
EcOz Environmental Consultants	70 Cavenagh Street, Darwin NT, 0801 08 8981 1100 ecoz@ecoz.com.au
NT Police	131 444

6.3 Objectives, targets and indicators of the Emergency Response Plan

The objectives, targets, and indicators of this Emergency Response Plan are summarised in Table 6-2.

Table 6-2. Emergency objectives, targets, and indicators summary

Objectives	Targets	Indicators
• Protect people, property and the environment	• No incidents of harm to people, property or the environment from activities associated with an environmental emergency	• Number of incidents recorded
• Identify potential environmental emergency risks	• All risks identified and management controls are in place	• Audits and inspection findings
• Identify and implement management and mitigation controls to reduce the residual risk		
• Ensure emergency response equipment requirements are able to be identified and are available	• All risks are identified and management controls are in place. • Emergency response scenarios have been identified	• Audits and inspection findings
• Ensure a high level of preparedness is maintained		
• Facilitate efficient response to emergencies to limit the impacts to the environment		
• Ensure emergency response training is relevant for the types of emergencies that MLE may experience	• Training for all employees	• Training records

6.4 Emergency response procedures

6.4.1 General emergency preparedness

MLE commit to continuous emergency preparedness through the following actions:

- Ensure that all personnel including management have received an induction that specifically covers emergency response procedures.
- The Operations Manager regularly liaises with staff to ensure that they are competent in responding to emergencies
- Conduct regular inspections on all emergency response equipment and ensure that all equipment is in good working order
- Following an emergency event, undertake an incident debrief and provide all staff with training into improved emergency response procedures or actions.

When advice is issued by authorities (i.e. severe storm or bushfire warning, evacuation order, etc.), the Operations Manager will ensure that the following steps will be undertaken:

- All employees and contractors will report to the assembly point and receive further instructions regarding preparations for the emergency or evacuation.
- Where there is sufficient preparation time:

- All essential vehicles will be fuelled, if required to evacuate employees, and non-essential vehicles will be parked, secured, and locked.
- All potentially mobile items will be secured, tied down and/or stored and locked away (site office or shed, if practicable).

Environmental conditions are monitored by the Operations Manager through the Bureau of Meteorology website, NT Police, Fire and Emergency Services announcements, social media, and local radio emergency.

6.4.2 Spills response procedure

In the case of any spills the following procedure is to be implemented:

- Locate the source to identify volume and type of spill
- Assess the risk to workers and environment to ensure appropriate PPE and measures to be implemented.
- Control and contain the spill by isolating or removing source.
- Clean the spill using spill kit and absorbent material or installing bunds.
- Dispose of contaminated spill control material appropriately.
- Report significant spills or spills that have entered stormwater to NT EPA Pollution Hotline (1800 064 567).

Spill containment equipment kits will be available in works areas (including in waste transport vehicles). All personnel on site will be trained how to use these spill kits.

6.4.3 Fire on-board vehicle

In the event of a fire on-board the waste transport vehicle the following procedure is to be implemented:

- Pull vehicle over in a safe location, preferably off the road in a paved or cleared area if available
- Assess the risk to workers and environment to ensure appropriate PPE and measures to be implemented.
- If safe to do so, extinguish the fire using appropriate firefighting equipment
- If unsafe to manage, call 000

APPENDIX A DANGEROUS GOODS SAFETY DATA SHEETS

1. PRODUCT IDENTIFICATION

Product Name	Lead Acid Battery, Wet
Other Names	Batteries, wet, filled with acid, electric storage,
Use	Automotive, Industrial Standby Power and Motive Power.
Supplier Name and Address	Century Yuasa Batteries 37-65 Cobalt St Carole Park QLD 4300
Telephone	(07) 3361 6161
Emergency (24 Hours)	(07) 3361 6707
Relevant identified uses	Starting, lighting, ignition for car, truck, etc

2. HAZARDS IDENTIFICATION

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the Model WHS Regulations and the ADG Code.

Poisons Schedule **S6** *Classified as S6:- Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)*

Signal Word **DANGER**

GHS Classification Metal Corrosion Category 1, Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 3, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1, Carcinogen Category 1A, Reproductive Toxicity Category 1A, STOT - SE (Resp. Irr.) Category 3*, STOT - RE Category 2, Acute Aquatic Hazard Category 1, Chronic Aquatic Hazard Category 1
**LIMITED EVIDENCE*

GHS Label Elements


Corrosive


Acute toxicity


Health Hazard


Environment

IN THE EVENT OF THE INTERNAL BATTERY COMPONENTS BEING EXPOSED

Hazard Statements

H290	May be corrosive to metals	**H350**	May cause cancer
H302	Harmful if swallowed	**H360**	May damage fertility or the unborn child
H314	Causes severe skin burns and eye damage	**H373**	May cause damage to organs through prolonged or repeated exposure
H318	Causes serious eye damage	**H400**	Very toxic to aquatic life
H331	Toxic if inhaled	**H410**	Very toxic to aquatic life with long lasting effects
H335	May cause respiratory irritation		

IN THE EVENT OF EXPOSURE TO INTERNAL COMPONENTS

Precautionary Statements

Prevention		***Response***	
P101	If medical advice is needed, have product container or label at hand.	**P301+P312**	IF SWALLOWED: Call a POISON CENTER/ doctor/ physician/ first aider/if you feel unwell.
P102	Keep out of reach of children	**P301+P330+P331**	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P273	Avoid release to the environment		
P103	Read label before use.	**P302+P352**	IF ON SKIN: Wash with plenty of water and soap
P280	Wear protective gloves /protective clothing/ eye protection/ face protection	**P303+P361+P353**	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.	**P304+P340**	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P271	Use only outdoors or in a well-ventilated area.	**P305+P351+P338**	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage		**P308+P313**	IF exposed or concerned: Get medical advice/attention
P405	Store locked up	**P310**	Immediately call a POISON CENTER/ doctor/ physician/ first aider
		P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
Recycle	Refer to section 13	**P342+P311**	If experiencing respiratory symptoms: Call a POISON CENTER/ doctor/ physician/ first aider
Disposal		**P363**	Wash contaminated clothing before reuse.
P501	Dispose of contents, container to authorised chemical landfill or if organic, to high temperature incineration	**P390**	Absorb spillage to prevent material damage.
		P391	Collect spillage.

3. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredient	Identification	Content % weight
Sulphuric Acid <51% (H_2SO_4)	CAS 7664-93-9	10-15%
Lead (PbO)	CAS 7439-92-1	30-40%
Lead Dioxide (PbO_2)	CAS 1309-60-0	30-40%
Inert material :- ABS resin or Polypropylene Borosilicate glass microfiber	CAS 9003-56-9 CAS 9003-07-0 CAS 65997-17-3	5-8%

4. FIRST AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

Eye contact

If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin contact

If skin contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.

Inhalation

If fumes of combustion products are inhaled:
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

Ingestion

For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do **NOT** induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

MEDICAL ATTENTION AND SPECIAL TREATMENT Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the desiccating action of the acid on proteins in specific tissues.

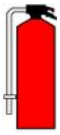
Ingestion:
- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful.
- Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

Skin:
- Skin lesions require copious saline irrigation.
- Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulphadiazine.

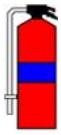
Eye:
- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjuctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.
- Cyclopaedic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

5. FIRE FIGHTING MEASURES

Recommended Extinguishing Media



Water spray or fog. ✓



Foam ✓

Dry chemical powder. ✓

Carbon dioxide. ✗

BCF\ Vaporising Liquid (Where regulations permit). ✓

Extinguishing Media Incompatibilities

- Water may cause electrical hazard If terminals not protected. .
- Use extinguishing media suitable for surrounding area.

Specific Hazards Hazardous Decomposition

- Non-combustible.
- Not considered to be a significant fire risk.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.

Fire Incompatibility

- Avoid strong bases.
- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Fire Fighting, Special Protective Equipment & Precautions

- **Do not** approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

- Avoid breathing vapours and contact with skin and eyes.

Environmental Precautions

- Prevent, by any means available, spillage from entering drains or water course.

Methods and materials for containment and cleaning up

- With a clean shovel, transfer spilled material into clean-labelled containers for disposal.
- Wash area down with excess water.
- Do not allow water to enter containers of acid as a violent reaction may occur.
- Prevent from entering drains, sewers, streams or other bodies of water. If contamination of sewers or waterways has occurred, advise the local emergency services

Protective Equipment

- Personal Protective Equipment advice is contained in Section 8 of the SDS.

Emergency Procedures

Minor Spills

- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.

Major Spills

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.

7. HANDLING AND STORAGE

Safe Handling

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Handle gently. Use good occupational work practice.
- Observe manufacturer's storage and handling recommendations contained within this SDS.
- Avoid smoking, naked lights, heat or ignition sources.
- Avoid mechanical and thermal shock and friction.
- Use in a well ventilated area.
- Avoid contact with incompatible materials.
- When handling DO NOT eat, drink or smoke.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.

Conditions for Safe Storage Includes Incompatible

- Avoid contact with moisture.
- Store in original containers.
- Keep containers securely sealed.

- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- No smoking, naked lights, heat or ignition sources.

Suitable container for Battery contents

- Battery is self-contained but it should be kept in a vertical position to prevent leakage of battery fluid
- **DO NOT** use aluminium or galvanised containers
- All packaging for Class 1 Goods shall be in accordance with the requirements of the relevant Code for the transport of Dangerous Goods.
- Class 1 is unique in that the type of packaging used frequently has a very decisive effect on the hazard and therefore on the assignment to a particular division

Storage incompatibility contents of battery

- Avoid reaction with oxidising agents
- Avoid strong bases.
- Avoid storage with reducing agents.
- Avoid reaction with metals and or water
- Contact with combustible organic matter may cause a fire.
- Avoid contact with finely divided metals.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have a pH of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.

✓ = May be stored together ⓘ = May be stored together with specific preventions ✗ = Must not be stored together

FLAMMABLES	EXPLOSIVES	ACUTE TOXIC	OXIDISERS	HARMFUL	IRRITANT	CORROSIVE
✗	✗	✓	✗	✓	✓	✓

8. EXPOSURE CONTROLS , PERSONAL PROTECTION

AUSTRALIAN EXPOSURE STANDARDS (Occupational Exposure Limits)

Ingredient	Material name	TWA	STEL
Sulphuric Acid (H_2SO_4)	Sulphuric acid	1 mg/m3	3 mg/m3
Lead (PbO)	Lead, inorganic dusts & fumes (as Pb)	0.15 mg/m3	Not Available
Lead dioxide (PbO_2)	Lead dioxide	0.15 mg/m3	Not Available

APPROPRIATE ENGINEERING CONTROLS

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:

- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

PERSONAL PROTECTION

Respirator Type

Not normally required; however if in contact with internal components:-

- Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	E-AUS P2	-	E-PAPR-AUS / Class 1 P2
up to 50 x ES	-	E-AUS / Class 1 P2	-
up to 100 x ES	-	E-2 P2	E-PAPR-2 P2 ^

^ - Full-face
E = Sulfur dioxide(SO2),

Glove Type

- Wear Elbow length chemical protective gloves, e.g. PVC.

Eye Protection

- Safety glasses with side shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.

Clothing

- Overalls.

Footwear

- Wear safety footwear or safety gumboots

Other Protection

- PVC protective suit may be required if exposure severe.
- Eyewash unit

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

The battery is a manufactured article containing a clear mobile acidic liquid. The electrolyte mixes with water.

Rectangular plastic casing with exposed terminals for electrical connections. High weight to volume ratio. The hazard of lead acid batteries include:

- CORROSIVE CONTENTS SHORT CIRCUIT - accidental discharge. Current flow by external short circuit may heat metals to welding temperatures with firehazard; Internal heat generated may boil battery acid with evolution of large amounts of highly corrosive acid mist/vapour. Boiling may develop internal pressure and cause explosion with scattering of acid contents.Battery circuits must include electrical fusible links. Terminals and external metal parts must be insulated. Do not clean terminals, battery top with conducting liquids.
- SPILL - damage to casing or overturning may cause corrosive acid contents to spill, causing skin burns on contact. Acid reacts quickly with many metals, generating highly flammable and explosive hydrogen gas; may also weaken metal structures. All lead acid batteries must be vented
- Chemical hazards relate to the contents of the battery. Yellow crystalline; does not mix well with water (1%).
- Soluble in acetone.

Odour	Not Available	**Lower explosive limits**	4.1% hydrogen gas
Odour threshold	Not Available	**Vapour pressure (kPa)**	Not Available
pH	<1 (for acid).	**Vapour density (Air = 1)**	>1
Melting point/ freezing point (°C)	Not Applicable	**Relative density (Water = 1)**	1.2-1.3 (Sulphuric acid electrolyte)
Initial boiling point and boiling range (°C)	95-95.55 °C	**Solubility in water (g,L)**	Miscible (acid)
Flash point	Not Applicable	**Partition coefficient: n-octanol/water**	Not Available
Evaporation rate	<1 BuAC = 1 (for acid)	**Auto-ignition temperature**	Not Available
Flammability	Not Applicable	**Decomposition temperature (°C)**	Not Available
Upper explosive limits	74.2%	**Viscosity**	Not Available

10. STABILITY AND REACTIVITY

Reactivity

See section 7

- Contact with alkaline material liberates heat

Chemical stability

- Product is considered stable under normal handling conditions.
- Stable under normal storage conditions.
- Hazardous polymerization will not occur.

Possibility of hazardous reactions

See section 7

- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.

Conditions to avoid

See section 7

Incompatible materials

See section 7

Hazardous decomposition products

See section 5

11. TOXICOLOGICAL INFORMATION

Inhaled

- Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects.
- Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.

Ingestion

- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.

Skin contact

- Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Eye

- If applied to the eyes, this material causes severe eye damage.
- Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely

Immediate effects

- As above

Chronic effects

- Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.
- Substance accumulation, in the human body, is likely and may cause some concern following repeated or long-term occupational exposure.
- Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.

Sulphuric Acid:

- Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyper reactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. Occupational exposures to strong inorganic acid mists of sulphuric acid:

Lead:

WARNING: Lead is a cumulative poison and has the potential to cause abortion and intellectual impairment to unborn children of pregnant workers.
An inorganic compound such as Lead is a cumulative harmful poison when exposed in small amounts can raise the body's content to toxic levels. Prolonged or repeated exposure to lead toxicity effects the nervous system (memory
loss, tiredness, headaches, fatigue, irritability, decreased libido, dizziness, depression, encephalopathy (brain damage
caused by altered brain function and structure), behavioural effects, altered mood states, disturbances in hand-eye coordination, reaction times, visual motor performance, and mental performance, disturbances to vision, changes in hearing, muscle and joint weakness of the arms and legs, (foot-drop and wrist-drop), heart / blood vessels (reduced haemoglobin synthesis and production, reduced life span and function of red blood cells, anaemia, increased blood pressure), digestive system (loss of appetite, anorexia, with severe abdominal pain, diarrhoea, inflammation of the stomach walls (gastritis) and colic, cramps, nausea, vomiting, constipation, weight loss and decreased urination, deposition of blue lead-line on the gums), kidneys / urinary system (reversible / irreversible kidney damage) and endocrine system. Increased levels of lead result in increased brain damage, coma and death in extreme cases.

- Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.
- Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.
- Lead can cross the placenta, and cause miscarriage, stillbirths and birth defects. Exposure before birth can cause mental retardation, behavioural disorders and infant death.
- Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).
- Ample evidence exists that developmental disorders are directly caused by human exposure to the material.
- Lead can accumulate in the skeleton for a very long time..

Acute Toxicity	Skin Irritation/ Corrosion	Serious Eye Damage/ Irritation	Respiratory or Skin sensitisation	Mutagenicity	Carcinogenicity	Reproductivity	STOT - Single Exposure	STOT - Repeated Exposure	Aspiration Hazard
✓	✓	✓	ⓘ	ⓘ	✓	✓	✓	✓	ⓘ

✓= Data required to make classification available ✗= Data available but does not fill the criteria for classification
ⓘ= Data Not Available to make classification

12. ECOLOGICAL INFORMATION

Ecotoxicity

- Prevent, by any means available, spillage from entering drains or water courses.
- DO NOT discharge into sewer or waterways.

Degradability

- No Data available for all ingredients

Bio-accumulative Potential

- No Data available for all ingredients

Mobility in Soil

- No Data available for all ingredients

Other Adverse Effects

- No Data available for all ingredients

13. DISPOSAL CONSIDERATIONS

Safe Handling & Disposal

- Dispose in accordance with federal, state or local regulations.

Disposal of Contaminated Packaging

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurrying in water; Neutralisation followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers.

Environmental Regulations

- Refer to section 15

14. TRANSPORT INFORMATION

REGULATED FOR TRANSPORT OF DANGEROUS GOODS ADG

UN Number 2794

Proper Shipping Name BATTERIES, WET, FILLED WITH ACID, electric storage

Transport Hazard Class Class: 8 **Sub risk:** Not Applicable

Packing group Not Applicable

Environmental Hazards No relevant data

Special Precautions Special provisions 295
Limited quantity 1 kg

Additional Information Marine Pollutant: = Yes

Hazchem Code 2R

Other Information The Australian Dangerous Goods Code (7th Edition) Special Provision 238 allows Century Yuasa Batteries Pty. Ltd. to transport non-spillable batteries as sold by the company by road and rail as non-dangerous goods. In addition, these batteries are certified as complying with UN2800 Special Provision A67 of the International Air Transport Association (IATA) Dangerous Goods Regulations. Refer to Century Yuasa Batteries office for further information.

15. REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS, LEGISLATION

Sulphuric Acid CAS 7664-93-9
Is found on the following regulatory Lists
"Australia Exposure Standards", "Australia Inventory of Chemical Substances (AICS)","International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft", "Australia Hazardous Substances Information System - Consolidated Lists"

Lead CAS 7439-92-1
Is found on the following regulatory Lists
"Australia Exposure Standards", "Australia Inventory of Chemical Substances (AICS)","International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "Australia Hazardous Substances Information System - Consolidated Lists"

Lead dioxide (PbO2) CAS 1309-60-0
Is found on the following regulatory Lists
"Australia Exposure Standards", "Australia Inventory of Chemical Substances (AICS)","International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "Australia Hazardous Substances Information System - Consolidated Lists"

16. OTHER RELEVANT INFORMATION

Revision Information

Revision N°	Date	Description
1	29/10/15	Initial SDS creation
2	01/02/2017	Adjusted to lead dioxide; included Inert material

Abbreviations

AICS	Australia Inventory of Chemical Substances
APVMA	Australian Pesticides and Veterinary Medicines Authority
AQIS	Australian Quarantine and Inspection Service
CAS #	Chemical Abstract Service Number – used to uniquely identify chemical compounds
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration- toxicity of the surrounding medium that will kill half of the sample population of a specific test-animal in a specified period through exposure via inhalation (respiration)
SDS	Safety Data Sheet- (SDS), previously called a Material Safety Data Sheet (SDS),

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