Woodlawn Leachate Treatment Plant Emergency Response Plan

(Incorporating the Pollution Incident Response Management Plan)

Woodlawn Leachate Treatment Plant
619 Collector Road, Tarago NSW 2580

Quality Information

Rev	Revision Details	Prepared by	Review by	Authorised By	Date
1	Final for submission to DPE	Harneet Puarr Woodlawn Environmental Officer	Ramona Bachu NSW Environment Officer	Henry Gundry Woodlawn Facilities Manager	30 August 2018

Contents

Pollution Incident Response Management Plan requirements

Summary	The purpose of the ERP is to provide a planned and coordinated strategy to Site Personnel in the event of an emergency situation at the NSW Woodlawn Bioreactor & MBT Facility, Crisps Creek Intermodal Facility, Leachate Treatment Plant and Pylara Farm. The strategy that is outlined considered both Work Health & Safety and Environmental Management requirements. The plan has been developed by identifying key potential hazard scenarios that could be encountered at the facility through Risk Management Programs. If a hazard scenario is encountered that is not addressed in this document, the Safety, Health, Environment and Quality (SHEQ) Division must be informed and the document will be reviewed and amended. The Veolia State Crisis Management Plan should be consulted to deal with a crisis as defined in the document. For any significant environmental harm as defined in the document the NSW Pollution Incident Response Management Manual should be consulted.	Section 1
Description and likelihood of hazards [clause 98C (1)(a) and (b)]	A register of hazards is contained with the Woodlawn Risk Register and Site Management Plan, which combined contain: · Identified environmental aspects · Potential impacts · Inherent (before taking existing controls into account) risk level for each impact · Residual (after taking existing controls into account) risk level for each impact Where high or extreme residual risks have been identified on site, these have been signed appropriate controls as detailed in the register and/or site management plan. Should any other such risk be identified they will be escalated to the attention of the site (and Veolia senior management) and dealt with in accordance with the Veolia Risk Management standard (ELE-COL-000-012).	Noted
Pre-emptive actions to be taken [clause	Pre-emptive actions are detailed in the Woodlawn Risk Register and are referred to as Controls, with appropriate supporting procedures referenced.	Noted

98C(1)(c)]		
Inventory of pollutants **[clause 98C(1)(d) and (e)]**	A full list of the bulk chemicals, their storage quantities and locations are detailed in the NSW Woodlawn Bio-Energy Hazardous Substances and Dangerous Goods Register	Noted
Safety equipment **[clause 98C(1)(f)]**	The site is equipped with safety devices such as safety showers, chemical decontamination kits, breathing equipment, first aid stations, spill kits, etc. Where additional PPE is required (eg. chemical suits) the requirements are spelled out in the relevant task-specific work instructions. MSDSs are located throughout the site in close proximity to the chemical they apply to.	Noted
Contact details **[clause 98C(1)(g) and (h)]**	The names, position titles and 24-hour contact details of key individuals who are responsible for activating the emergency plans and managing the responses are detailed in the Emergency Contact List (refer Section 5 and Appendix A of the ERP). The contact details of the EPA, the local council, fire and emergency services, as well as other relevant regulatory authorities are also contained in this section.	Section 5
Communicating with neighbours and the local community **[clause 98C(1)(i)]**	The mechanisms that will be used for providing early warnings and regular updates to the owners and occupiers of premises who may be affected by a pollution incident occurring on site are detailed in the Pollution Incident Response Management Manual, which is accessible on the Veolia website	Noted

Minimising harm to persons on the premises [clause 98C(1)(j)]	To minimise the risk of harm to any persons who may be on the premises should an incident occur a number of incident response procedures have been developed. The response procedures detailed in Section 6 of the ERP and include potential emergencies and incidents such as: · Bomb threats · Dam breaches, fault or overflow · Explosions · Electrocutions or power failure · Fires · Gas Line extraction system failures or leakage · Geotechnical instability · Leachate - exposure · Lone Worker and medical emergencies · Railway collision or derailment · Spills · Vehicle accidents · Operations during severe weather	Section 6 and 7
Maps **[clause 98C(1)(k)]**	A set of maps and diagrams have been prepared for the site (refer Appendix D and E of ERP). The following typical details are included: · The location of the premises and the surrounding area that is likely to be affected by a pollution incident; · The location of potential pollutants on the premises	Appendix D and E
Actions to be taken during or immediately after a pollution incident **[clause 98C(1)(l)]**	The ERP includes detailed descriptions of the actions that will be taken immediately after a pollution incident to reduce or control any pollution. In addition, detailed chemical and hazardous material management procedures have been developed. The procedures include spill/emissions response and clean up/remediation instructions. Further information regarding the site's readiness for incidents and emergencies can be found in the ERP, including the notification requirements.	Section 7.7

Staff training **[clause 98C(1)(m)]**	All relevant employees are trained in Incident and Emergency management (refer Section 6 of the ERP). The training consists of two major components: · Theoretical module – ERP training · Practical component – participation in both desktop and incident and emergency scenario simulation drills. Training records will be maintained on the site training database and in the staff personnel folders.	Section 6

1. Emergency Response Plan, Purpose and Scope

Emergency response planning is the act of anticipating and preparing for emergency situations which may occur and impact the business. The basic principle of emergency response planning is to ensure the health and safety of workers and minimise any adverse effects to the environment and Veolia ANZ or client's property.

This document aims to ensure the Woodlawn Leachate Treatment Plant (LTP) can respond to any emergency situation (i.e. medical, fire, natural disaster) in a planned and rehearsed manner. This plan has been developed in line with the Crisis Management Manual and Emergency Management Procedure, by identifying key potential hazard situations which could be encountered at the facility.

The Emergency Response Plan (ERP) applies to all Veolia management, workers and contractors involved in work activities for Veolia at Woodlawn LTP . Where Veolia workers of this site conduct work activities on a client site, workers will be required to respond to an emergency in accordance with any client site specific requirements and respond to appropriate directions from the client's emergency response personnel.

The Veolia State Crisis Management Plan should be consulted to deal with a crisis as defined in the document. For any significant environmental harm as defined in the document the NSW Pollution Incident Response Management Manual should be consulted.

1.1 Facility Overview

The LTP is located on the Woodlawn Eco Precinct Site at 619 Collector Road, Tarago.

The LTP is located on north side of the void between the Woodlawn Bioreactor and Evaporation Dam 1 (refer to Appendix E).The site consists of an aeration dam, a balance tank, anoxic and aeration tanks, an ultrafiltration system and a centrifuge.

The activities conducted at the LTP site include treatment of leachate from the Bioreactor to higher quality effluent, which aims to facilitate better environmental and operational performance by allowing Veolia to extract and treat greater volumes of leachate and reduce the generation of odour, as part of Woodlawn's long-term leachate management strategy.

Key chemical storage on LTP site (see Appendix D for location):

Chemical	Amount	Classification	Description
Methanol	52,300L	CAS number: 67-56-1	Methanol tank designed to comply with AS1940 and UL2085 and is fire rated to UL2085. Stored within a bund
Phosphoric Acid	3000L	CAS number: 7664-38-2	Stored within a bund

Caustic -Sodium Hydroxide -Potassium Hydroxide	20,000L	CAS number: 1310-73-2 CAS number: 1310-58-3	Stored within a bund

1.2 Legal and Other Requirements

The following regulatory framework applies to this ERP:

- Project Approval – Woodlawn Expansion Project (10-0012) issued under the Environmental Planning and Assessment Act 1979 (PA)
- Development Consent (DA-31-02-99) issued under the Environmental Planning and Assessment Act 1979 (DA)

1.2.1 Project Approval 10-0012

Relevant COC	Requirement	ERP Reference
Condition 25	**Fire and Emergency Management** The Proponent shall prepare and implement a Fire and Emergency Management Plan for the Landfill. This plan must: (a) be prepared by a suitably qualified and experienced expert; (b) be approved by the Secretary prior to the commencement of expanded operations; (c) identify all threats to the environment and public health that could arise from the operation of the project (e.g. fire, overflow or dam failure); (d) identify strategies to contain and minimise the effects of any threats to the environment and public health such as (but not limited to); • measures to minimise the risk of fire on site, including in the landfill area; • actions to extinguish any fires on site promptly; • measures to ensure adequate fire-fighting capacity on site, including a fire fighting tanker; and (e) detail a communication strategy for notifying the relevant government agencies and potentially affected community in the event of an emergency; and (f) address any chemical storage required to operate the LTP and be consistent with the Department of Planning and Environment's Hazardous Industry Planning Advisory Paper No. 1, 'Emergency Planning'. This plan must be documented in the Landfill EMP (see	a) Noted b) Noted c) Section 7 d) –Refer to section 4.4.1 of LEMP -Section 7.5 -Section 7.5.1 e) Section 6 f) Section 1.1

	condition 3 in schedule 7). Prior to the operation of the LTP, the Fire and Emergency Management Plan must be revised and approved by the Secretary.	
Condition 25A	**Safety Management System** A comprehensive Safety Management System, covering all on-site operations and associated transport activities involving hazardous materials. Records from the Safety Management System must be kept on-site and must be available for inspection by the Secretary upon request. The Safety Management System shall be consistent with the Department of Planning and Environment's Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'	Noted
Condition 25B	**Chemical Storage** The Applicant must store all chemicals, fuels and oils used on-site in accordance with: (a) the requirements of all relevant Australian Standards; and (b) the NSW EPA's '*Storing and Handling of Liquids: Environmental Protection- Participants Handbook*' if the chemicals are liquids. In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.	Noted

1.2.2 Development Consent (DA-31-02-99)

Relevant COC	**Requirement**	**ERP Reference**
Condition 159	In relation to matters identified in Condition 158, as part of the LEMP, the Applicant must prepare an Emergency Management Plan. The Plan shall address, but not necessarily be limited to: a) identification of threats to the environment and/or public health that could arise in relation to the construction and operation of Waste Management Facility and Intermodal Facility including the transportation of waste. These threats may include fire (waste transportation or within the landfill), overflow, dam failure, power or other utility failure, natural disaster etc; b) identification of strategies to minimise and ameliorate the effects of any groundwater surface water pollution identified from the groundwater and surface water monitoring programs;	a) -f) Addressed in Emergency Response Plan effective 19 January 2017 approved by DPE and is not included in scope of approval of the

	c) an estimate of the cost of implementation; d) actions to effectively respond to the disruption of operations so the risk of pollution is minimised; e) a communications strategy for alerting relevant agencies and the potentially affected community in the event of the disruption to operations leading to significant pollution; f) ensuring that all relevant employees are familiar with the emergency management plan; and g) any chemical storage required to operate the LTP and be consistent with the Department of Planning and Environment's Hazardous Industry Planning Advisory Paper No. 1, 'Emergency Planning'. The Applicant should regularly review the adequacy of the plan obtaining expert advice as required.	Management Plans for LTP g) Noted
Condition 159A	Prior to the operation of the LTP, or within such further period as the Secretary may agree, the Applicant shall prepare and submit a revised Emergency Management Plan to the Secretary for approval. The plan shall include the site changes in MOD 2 and MOD 3, in accordance with the requirements of Condition 159.	Noted
Condition 159B	**Safety Management System** A comprehensive Safety Management System, covering all on-site operations and associated transport activities involving hazardous materials. Records from the Safety Management System must be kept on-site and must be available for inspection by the Secretary upon request. The Safety Management System shall be consistent with the Department of Planning and Environment's Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'	Noted
Condition 159C	**Chemical Storage** The Applicant must store all chemicals, fuels and oils used on-site in accordance with: (a) the requirements of all relevant Australian Standards; and (b) the NSW EPA's '*Storing and Handling of Liquids: Environmental Protection- Participants Handbook*' if the chemicals are liquids. In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.	Noted

2. Activation of Emergency Response Plan

The events which trigger activation of the Emergency Response Plan (ERP) are incidents with the potential to:

- Affect the health and safety of workers or the general public;
- Cause adverse effects to the environment; and
- Cause damage to Veolia property.

It is important to appreciate the ERP may not always be activated in isolation, and may be activated in conjunction with other plans such as the Business Continuity Management Plan (BCM), Disaster Recovery Plan (DRP) and Crisis Management Plan (CMP), depending on the nature of the emergency situation and potential impacts on the business.

Note: Plans to specifically manage incidents which impact the ability to continue operational activities are known as Business Continuity Management Plans (BCMP); these are owned and managed by the site. Plans to deal with a critical IT service-delivery failure are known as Disaster Recovery Plans (DRPs); these are owned and managed by the corporate IT department. Plans to deal with a crisis (i.e. significant damage, serious injury, environmental harm or media attention) are called a Crisis Management Plan (CMP); these are owned and managed by the State Head Office.

3.Unplanned Scenarios

In the event of an unplanned emergency situation occurring not considered in this ERP, management will work with site emergency response workers i.e. Chief Warden/ Warden and SHEQ Team to determine an appropriate response plan (refer to Appendix A Woodlawn LTP Emergency Contact List).

On completion of the emergency response, the review and evaluation processes will be conducted and necessary changes enacted.

4.Emergency Response Plan Access, Testing, Evaluation, Review and Maintenance

4.1 Access

The latest approved version of the ERP is maintained on the Business Management System (BMS), and a hard copy is held onsite at the Reception Desk of the Bioreactor and in the office at the LTP. All site workers will be trained in this ERP when undertaking the site induction.

4.2 Testing

The ERP will as a minimum be tested annually in accordance with Emergency Response Procedure. Records of any testing conducted will be maintained

4.3 Review and Maintenance

4.3.1 General

The ERP will as a minimum be reviewed annually, and amended as required when any of the following occurs:

- Significant operational changes (e.g. addition of new processes to a work area which
- introduce new potential emergency situations);
- Significant new emergency risks identified; and
- On completion of an emergency response (within one month of the incident)

This will ensure the relevance, accuracy and effectiveness of the information provided.

4.3.2 Post Emergency Response Plan Use, Evaluation and Review

After an emergency where the ERP is activated, the manager/supervisor must ensure the incident is entered in RIVO and coordinate an emergency response plan review involving key personnel from the site and other stakeholder groups involved in the management of the emergency.

A record of the Emergency Response Plan testing must be completed and kept on site, and where opportunities for improvement or required changes are identified, corrective actions must be documented, entered in RIVO and the ERP updated to reflect changes.

5. Governance, Roles and Responsibilities

Role	Responsibility
Managers/Supervisors	Managers and supervisors have the responsibility to: • Notify Chief Warden/Warden of emergency situation; • Follow instruction from the Chief Warden/Warden and assist to manage the emergency in accordance with the relevant site ERP; • In the absence of Chief Warden/Warden contact emergency services if life or property is threatened; • If significant damage, serious injury, environmental harm or media attention, notify senior management or State Crisis Management team as soon as possible; • Manage all public/media/regulatory authorities in accordance with Crisis Management Plan (CMP); • Take notes of relevant information and significant event times to assist in the investigation and reporting process; • Ensure no fault, blame or speculation on the incident is made until a

	full investigation is undertaken; • Ensure no media or other unauthorised person access the site of the emergency; • Ensure no details of the emergency are released to anybody (other than emergency services) unless directed by senior management; and • Ensure the incident is entered in RIVO.
Employees(Workers)	Employees have the responsibility to: • Take immediate action to ensure own safety and the safety of others where safe to do so; • Not take any action which places your safety or the safety of others at risk; • Obtain assistance from others on site, never attempt to handle an emergency situation alone; • Advise the senior person on site of the emergency situation; • Apply the relevant site ERP; and; • In the event of an emergency, and in the absence of instructions, assemble at the site emergency assembly area.
Site Emergency Personnel Chief Warden/ Deputy Warden	Site Emergency Personnel Chief Warden or Deputy Warden, in the event of an emergency situation shall wear a white safety helmet with the wording Chief Warden printed across the front. On becoming aware of an emergency, shall take the following actions: • Ascertain the nature of the emergency and determine appropriate action; • Ensure appropriate emergency service has been notified; • Ensure Fire wardens (where applicable) are advised of the situation; • If necessary, initiate evacuation and controlled entry to affected areas; • Ensure progress of the evacuation and any action taken is recorded in an incident log; and • Brief the emergency services personnel upon arrival on type, scope and location of the emergency and status of the evacuation and, thereafter, act on the emergency services instructions.
Warden	The Warden in the event of an emergency situation shall wear a red safety helmet with the wording Warden printed across the front. On hearing an alarm or on becoming aware of an emergency, the Warden shall take the following actions: • Implement the emergency procedures for the work area; • Ensure the appropriate emergency service has been notified; • Check or direct a responsible persons to check the work areas for any abnormal situation; • Establish a safe exit and commence evacuation if the circumstances in the work site warrant this; • Check to ensure fire doors and smoke doors are properly closed; • Search the work area to ensure all personnel have been evacuated; • Ensure orderly flow of persons into protected areas, e.g. stairwells; • Assist persons with disabilities; • Act as a leader of groups moving to nominated assembly areas; • Communicate with the Chief Warden by whatever means available and act on instructions; • Advise the Chief Warden as soon as possible of the circumstances and action taken; • Co-opt persons as required to assist during an emergency; and • Operate the intercommunication system.

First Aid Officers	First Aid Officers in the event of an emergency situation wear a green safety helmet with the wording First Aid Officer printed across the front. On hearing an alarm or on becoming aware of an emergency, shall take the following actions: ● Take the portable first aid kit and follow the instruction of a warden; ● Render medical assistance and guidance within their ability, training and scope; and ● Determine whether an emergency ambulance should be utilised.

6. Emergency Response

6.1 General Emergency Response Requirements for all Situations

In the event of any emergency situation the following steps must always be followed in the first instance, regardless of the nature of the emergency situation.

6.1.1 Danger

Consider the immediate safety of yourself and other personnel , in the vicinity. Where possible and **only where safe to do so**, make the situation safe by immediately eliminating or isolating the hazard.

6.1.2 Send for Help

Obtain assistance through whatever means possible i.e. yelling out, activating manual emergency call points, phone, radio, alarm systems. Once you have assistance, provide the person with the following details:

- Who you are i.e. name, position;
- Nature of emergency;
- Where you are;
- List hazardous situations;
- Number of people involved; and
- What you need – i.e. first aid, immediate assistance by site personnel, emergency services (fire, ambulance, police).

Confirm the person you are speaking to understands the situation and what you need them to do by asking them to repeat back the information.

6.1.2.1 Contacting Emergency Services Phone ‘ 000 ‘

In the event emergency services are required phone ‘000’. If there is no access to a landline, dial 112 from a mobile phone. Advise the emergency services operator state you are in (i.e. NSW) and the service you require (fire, ambulance, police). You will be connected to the required section. You will need to provide the next operator with the following information:

- Exact location and address; and
- Nature of emergency situation i.e. person trapped in a rolled over vehicle who is unconscious and bleeding.

6.1.2.2 Site Emergency Contacts

The Incident Management team, workers and other external agencies who have a responsibility or must be notified in the event of an emergency situation are listed in Appendix A Woodlawn LTP Site Emergency Contacts.

6.1.2.3 Notify Management and SHEQ Unit

Once immediate assistance is obtained, notification must be made to the manager/supervisor of the emergency, except in the case of an environmental incident - in which case it is immediate as per PIRM Manual. The manager/supervisor (or nominated site personnel) will ensure plan is enacted where appropriate, and notification is made as soon as practicable to the following:

- Site emergency personnel i.e. Chief Warden/Warden/First Aid Officer;
- Senior Manager;
- Group SHEQ Manager; and
- SHEQ Team.

In the case of an environmental incident, the relevant authorities must be notified;

- EPA
- Goulburn Mulwaree Council
- Palerang Shire Council
- the Ministry of Health (or the local public health unit),
- SafeWork NSW,
- NSW Fire and Rescue

6.2.1 Danger Response Send Airway Breathing Circulation and Defibrillator and Disability (DRS ABCD)

If the event you're the first person to respond to an emergency situation where there is a casualty(s) use the DRS ABCD action plan to assess and manage the casualty(s). In the event there are multiple casualties the unconscious casualty should be given priority.

The DRS ABCD Action Plan:

6.2.1.1 Danger

Do not put yourself at risk, and where possible and safe to do so, remove the casualty from any immediate dangers.

6.2.1.2 Response

- Check for a response (if unresponsive) – use voice, touch, and pain stimuli (in that order);
- If responsive ask the casualty what the nature of their medical emergency is and take appropriate action;
- If the casualty is suffering from a known medical condition, ask if they have a
- management plan i.e. asthma, diabetes or have medications you can get for them; and
- With all casualties, regardless of conscious state, talk calmly and reassuringly and tell
- them what you are doing.

6.2.1.3 Send

Send for help (refer to Contacting Emergency Services phone '000'). Appoint a worker to meet the ambulance.

6.2.1.4 Airway

- Is the casualty talking or responding to you? If yes, the airway is clear move to Breathing; and
- If no, the casualty is unconscious, open the airway by slightly tilting the head back and check for visible obstructions in the mouth. Never place fingers or materials which could break in the mouth of an unconscious person.

6.2.1.5 Breathing

- Check if the casualty is breathing and consider if the breathing is normal. If yes, move to Defibrillation and Disability;
- If no, consider the quality and quantity of the breaths being made i.e. depth (shallow, deep), noise (gurgling, wheeze, stridor), too little: (<10 is not enough breaths per minute), too many: (>30-40 ineffective breaths); and
- What is the casualty's appearance (blue, red, pale, sweaty, distressed, anxious, gasping, clutching throat)?

6.2.1.6 Circulation

- In the case of an unconscious casualty who has failed the breathing assessment, start Cardiopulmonary Resuscitation (CPR) by giving 30 compressions followed by 2 breaths;
- When providing 30 compressions (at approximately 100/min) and giving 2 breaths (each given over 1 second), this should result in the delivery of five cycles in approximately two minutes;
- If you are unwilling or unable to apply rescue breathing you should do continuous chest compressions without any pause at a rate of approximately 100/min; and
- If there is another person available who is able to assist in CPR until emergency services arrive, take turns delivering CPR by swapping every 2 minute cycle, as the effectiveness of CPR delivery substantially decreases with fatigue. When swapping, reduce the amount of time "off the chest" as much as possible.

6.2.1.7 Defibrillator and Disability

<u>Not Breathing (Defibrillation)</u>

- If the unconscious casualty has failed the breathing assessment and is under CPR, attach an Automated External Defibrillator (AED) as soon as possible (where available) and follow the prompts. If a second person is present have them attach the pads whilst you continue CPR; and
- continue CPR until the casualty regains responsiveness or commences normal breathing (between 10-20 breaths per minute).

<u>Breathing (Disability)</u>

- If the unconscious casualty is breathing assess their disability;
- Disability refers to different aspects which consider the casualty's ability to function normally;
- Do they only open their eyes when you talk or touch them or provide a painful stimulus? Or do they not open their eyes at all? Are they sleepy?;
- When talking are they oriented to time, place and person? Or are they confused? Are the words inappropriate or incomprehensible? Do they just make noises? Or are they not making any noise at all?;
- In regards to movement, can they follow an instruction such as squeeze my hand? Are they combative? Do they withdraw from touch or painful stimuli? Do they do purposeful movements? Are they in fixed posture or positions? Or is there no muscle tone or movement at all?;
- After doing DRS ABCD treat any other injuries i.e. cuts, burns, broken limbs;
- Stay with the casualty until further medical assistance arrives; and

- Always keep constant watch on the casualty, and continuously reassess their response, airway, breathing, circulation and disability as it can quickly alter.

6.3.1 Emergency Assembly Area

In the event of a site emergency, and in the absence of specific instructions from the Chief Warden/Warden/manager/supervisor, all site personnel will gather at the Site Emergency Assembly Area and await further instructions from emergency services or Veolia management. Refer to Appendix D Woodlawn LTP Site Evacuation Diagram.

6.4.1 Transport of a Worker to Medical Treatment

In the case of an injury to a worker, a first aid officer will determine whether there is a need to be transported via an emergency ambulance or whether the worker can be transported through other means arranged by Veolia. Where there is any doubt whether an worker is in a safe condition to be transported by means arranged by Veolia, an emergency ambulance should be engaged.

Where transport is arranged by Veolia, an worker may be transported (not the driver) in a vehicle to an appropriate medical facility. The worker's manager/supervisor will attend either by travelling with the worker or in a separate vehicle. If there is any concern by the first aid officer the employee's (workers) condition may deteriorate on route and possibly need medical assistance i.e. feeling dizzy and could faint, a qualified first aid officer must ride as a third passenger (not the driver) in the vehicle.

6.5.1 Managing the Emergency Response

- When the relevant emergency service arrives, Chief Warden/Warden/Manager/Supervisor/ worker should hand over control of the site and remain on hand to provide information and access, as required; and
- In most emergency situations it is expected the emergency response will be coordinated from the Bioreactor reception. If safe to do so, the Chief Warden/Warden should remain in attendance throughout the emergency to provide information and assistance to the attending emergency service.

7.1 Medical Emergency

7.1.1 Medical Emergency Onsite

- Raise the alarm and gain attention by whatever means possible;
- Where possible notify site manager/supervisor; and
- Implement DRS ABCD

7.1.2 Medical Emergency Offsite

- Raise the alarm and gain attention by whatever means possible;
- Where possible notify the manager/supervisor;
- Implement DRS ABCD; and
- The manager/supervisor will arrange for emergency medical services to attend the scene if necessary or arrange for retrieval of the worker and medical treatment through normal processes.

7.2 Electrical Emergencies

7.2.1 Electrical Shock

Electric shock occurs upon contact of a body part with a source of electricity which causes sufficient current to pass from the source through the skin, muscles or hair. Depending on the severity and length of the shock, injuries can include:

- Burns to the skin;
- Burns to internal tissues; and
- Electrical interference or damage (or both) to the heart, which could cause the heart to stop (cardiac arrest) or beat erratically (fibrillation or tachycardia).

Upon being notified of a person who has suffered electric shock or discovering a person who has been shocked by electricity the following steps must be followed to ensure the health and safety of all workers involved:

Danger

- Check for your own safety and the safety of the casualty and bystanders;
- HIGH VOLTAGE wait until the power is turned off;and
- LOW VOLTAGE Immediately switch off the power. If this is not practicable, pull or push the casualty clear of the electrical contact using material, such as wood, rope, clothing, plastic or rubber. Do not use metal or anything moist.

Responsiveness

Check for response (verbal and tactile stimuli), touch and talk.

- Send/shout for help;
- Send a bystander to dial 000 and ask for Ambulance;
- If available send for Automatic External Defibrillator (AED); and
- If alone shout for help.

Airway

- Place the casualty on their back; and
- Tilt the head back and raise the chin forward.

Breathing

- Check for normal breathing, observe chest movement, listen and feel for breathing;
- Give two initial breaths; and
- In the absence of normal breathing and no one has gone for help, place casualty in recovery position and go for help.

Circulation

- Position hands on centre of the chest;
- Give 30 chest compressions followed by 2 breaths. Depress breastbone 1/3 the chest depth (approx 4 cm or 5 cm) at the rate of 100 compressions a minute;
- As soon as available attach AED and follow the instructions;
- Continue CPR, 30 compressions: 2 breaths;
- When casualty's normal breathing returns cease resuscitation and move the casualty into the recovery or coma position; and
- Keep a constant watch on the casualty, to ensure they do not stop breathing again, until trained assistants take over.

Medical Review

Regardless of the size of the electric shock received, all workers who receive an electric shock must immediately attend an emergency medical facility for review. Electric shock has the potential ability to change electrical impulses of the heart and cause it to stop beating or beat erratically immediately, or some time later, even hours after the event. These changes in heartbeat may not be apparent to the casualty i.e. stating they feel fine. These types of changes can only be detected with specialist cardiac monitoring equipment, and hence the requirement for a medical review to rule out any such damage.

7.2.2 Power Lines Down

In the event that a worker identifies a power line coming down or already down, the following steps are to be followed:

- Danger: The worker is to ensure they remain outside of an 8 metre radius of the downed line, and ensure anyone in the immediate area is notified of the imminent danger. The area should be barricaded off to ensure no persons/vehicles can approach the fallen power lines. The area should remain under supervision to ensure no one enters the area until power company authorities attend and take control of the incident scene;
- Send for help: the worker is to notify Essential Energy 13 20 80 or your local emergency number 000, and refer to Medical Emergencies if there are any injuries. The worker should contact their manager/supervisor and advise them of the situation; and
- Re-entry to the area and removal of any barricades must only be done under instruction from the power company, once they have declared the area safe.

7.3 Mobile and Fixed Plant Emergencies

7.3.1 Failure of Leachate Plant

- Stop what you are doing;
- Turn off equipment where safe to do so and activate emergency stops;
- Check surrounding area for danger to yourself and others working in the vicinity;
- Notify manager/supervisor immediately, they will arrange for plant isolation; and
- Do not attempt to reuse the plant until such time as the manager/supervisor gives instruction the plant is safe for use.

7.3.2 Motor Vehicle Accidents

Refer to VES Motor Vehicle and Public Liability Accident Reporting Procedure.

7.4 Working at Heights Emergencies

A fall from any height, even ground level, is capable of inflicting a life threatening injury. If the worker has fallen and has back, neck or other distracting injuries i.e. pain in another limb, minimise all movement and encourage the casualty to hold as still as possible until medical assistance arrives. Only ever move the casualty if in immediate danger (i.e. falling objects, risk of being struck).

Where a worker falls and is not undertaking a task is considered working at heights, implement DRS ABCD.

Where a worker falls and is undertaking a task that is considered working at heights, refer to Veolia's Working at Heights Procedure or the site/job task Working at Heights Rescue Plan for more details.

7.5 Fire Related Emergencies

7.5.1 Fire Onsite

Upon hearing the emergency alarm or discovering a fire, alert the Chief Warden/Warden and take the following action:

- R – Remove people from the immediate vicinity of the fire;
- A – Alert the fire service by following Contacting Emergency Services Phone '000' or by operating the nearest manual call point [break glass alarm]:
- C – Confine the fire and smoke by closing doors and windows in the affected area if safe to do so; and
- E – Extinguish or control the fire if trained and only if safe to do so.

The following controls are available onsite; Fire extinguishers (see appendix D), Water cart Dump and Truck mounted water cart.

Always obey the instructions of the warden(s) or emergency services, and if required to evacuate, proceed directly to your nominated emergency assembly area and remain there for further instruction. The site's emergency assembly area is identified in Appendix D LTP Evacuation Diagram.

7.5.2 Bushfire

- Raise the alarm and obtain assistance if required;
- If required contact emergency services by following Contacting Emergency Services Phone 000;
- Immediately notify the Chief Warden/Warden and manager/supervisor of the situation;
- Restrict entry to the site by shutting the gate and manning with a worker
- Chief Warden and manager/supervisor will delegate workers to check and evacuate site work areas of any visitors to the site;
- Refer to the Woodlawn Bioreactor ERP for further guidance

7.6 Explosion Related Emergencies

7.6.1 Explosion Onsite

- Immediately notify the Chief Warden/Warden and manager/supervisor and SHEQ team of the situation.
- If required contact emergency services by following Contacting Emergency Services Phone 000;
- Provide information in relation to: type of emergency, location of emergency, number of people injured;
- Remove people from immediate danger, restrict access to the affected area
- Prepare for site evacuation; and
- If the explosion has caused the release of liquids on site, protect storm water drains and enact spill response processes.

7.7 Spills (Hazardous/Non-hazardous/Solid/Liquid/ Gas) Related Emergencies

- Refer to Chemical and Hazardous Materials Management; and
- If the spill is considered to present a significant risk to people, take immediate action to remove all people from the area and remain up-wind and uphill of the spill.

7.7.1 Methanol spill

(refer to Safety Data Sheet attached appendix F)

- On the discovery of a methanol spill, obtain assistance if necessary;
- Inform the chief warden/ warden and manager/ supervisor and SHEQ team;
- Ensure unauthorised people are kept clear of the area of the spill;
- Avoid skin/eye contact and inhalation with methanol by wearing suitable personal protective equipment; respirator, faceshield, safety glasses or splash-proof goggles, PVC or neoprene gloves, chemical-resistant coveralls or PVC splash apron and safety footwear;
- In case of **contact with skin**, immediately use an emergency eyewash or safety shower (refer to Appendix D), and flush exposed area with copious amounts of lukewarm water for at least 15 minutes. Contaminated clothing and shoes should be removed under the shower. Wash area thoroughly with soap and water. Seek medical attention if irritation or pain persists or if symptoms of toxicity develop. *Wash contaminated clothing and shoes before reuse*;
- In case of **contact with eyes**, immediately flush the eyes with copious amounts of lukewarm water for at least 15 minutes. The eyelid should be held apart during the flushing to ensure all accessible tissue of the eyes and the lids are in contact with water. Obtain medical attention;
- In case of **inhalation of methanol vapors**, first remove the individual to fresh air if it is safe for you to do so, and keep him or her warm and at rest. Monitor for respiratory distress. If difficulty in breathing develops or if breathing has stopped, administer artificial respiration or cardiopulmonary resuscitation (CPR) immediately and seek medical attention. If trained to do so, administer supplemental oxygen with assisted ventilation, as required;
- Avoid contaminating waterways, drains and sewers. If product does enter a waterway, advise the Environmental Protection Authority (EPA);
- Ensure all ignition sources are extinguished;
- Contain spillage, then cover/ absorb spill with non-combustible absorbent material (vermiculite, sand, or similar). When saturated collect material, transfer to suitable, labelled, dry chemical-waste containers and dispose of promptly as hazardous waste
- For smaller quantities, absorb on paper, sand, or similar and evaporate in an open area
- For large volumes, atomise into incinerator or recycle by gravimetric separation, distilling and reusing, the methanol spill can be diluted with at least four parts water to one part methanol to reduce the risk of fire; and
- As conditions permit, remove methanol and transfer to the appropriate disposal area.
- *Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), alkalis (eg. hydroxides), heat and ignition*

7.7.2 Methanol vapour release

- If methanol concentrations in air reach or exceeds limit, operators in the area will have personal gas monitors that will sound an alarm;
- On detection of methanol vapour release, immediately stop all activity in the area;

- Inform the chief warden/ warden/manager/supervisor/ SHEQ team;
- Inform all people, vehicles and equipment to keep at least 100 metres clear of the area;
- If the leak cannot be controlled contact emergency services by following Contacting Emergency Services Phone 000; and
- Ensure access to appropriate emergency location is communicated and maintained for emergency services to enter the site, and on their arrival follow the instructions of the personnel

7.7.3 Phosphoric Acid spill

(refer to Safety Data Sheet attached appendix F)

- On the discovery of a phosphoric acid spill, obtain assistance if necessary;
- Inform the chief warden/ warden and manager/ supervisor and SHEQ team;
- Ensure unauthorised people are kept clear of the area of the spill;
- Avoid skin/eye contact and inhalation with phosphoric acid by wearing suitable personal protective equipment; respirator, faceshield, safety glasses or splash-proof goggles, PVC or neoprene gloves, chemical-resistant coveralls or PVC splash apron and safety footwear;
- Avoid contaminating waterways, drains and sewers. If product does enter a waterway, advise the Environmental Protection Authority (EPA);
- Neutralise spilled product with lime or soda. Soak up using absorbent material such as sand or soil. When saturated, collect material and transfer to a suitable, labelled, dry chemical-waste container and dispose of promptly as hazardous waste;
- Ventilate area and wash spill site after material pickup is complete;
- *Incompatible with strong oxidising agent, reducing agents, sulfides, phosphides, cyanides, acetylides, fluorides, silicides, carbides, strong caustic material, alloys, glass, leather, natural rubber, fluorine gas, arsenic trioxide*

7.7.4 Caustic spill

(refer to Safety Data Sheet attached appendix F)

- On the discovery of a caustic spill, obtain assistance if necessary;
- Inform the chief warden/ warden and manager/ supervisor and SHEQ team;
- Ensure unauthorised people are kept clear of the area of the spill;
- Avoid skin/eye contact and inhalation with caustic by wearing suitable personal protective equipment; safety glasses with side shields, impervious protective gloves, flame-retardant coveralls and anti-static footwear;
- Avoid contaminating waterways, drains and sewers. If product does enter a waterway, advise the NSW SHEQ team immediately as this would be a notifiable incident to the NSW Environment Protection Authority (EPA);
- Spills and leaks should be minimised by an adequate supply of water for washing down;
- Ventilate area and wash spill site after material pickup is complete.
- *Incompatible with strong oxidising agents, bases, mineral acids and sources of ignition*

7.7.5 Tank Failure (overflow) - Leachate System Leak/Spill

- On the discovery of a leachate system leak or spill, obtain assistance if necessary;
- Inform the chief warden/ warden and manager/ supervisor and SHEQ team;
- Ensure unauthorised people are kept clear of the area of the spill;

- Avoid skin/eye contact with the leachate by wearing suitable waterproof gloves, face protection, clothing and boots;
- All liquid collected will be directed to flow down towards a leachate valve (within the LTP), from which a pipe will divert the liquid to the leachate aeration dam

7.8 Severe Weather and External Related Emergencies

7.8.1 Storm - dust/hail/ high wind/ lightning

- Refer to Veolia Severe Weather Procedure

7.8.2 Heatwave

A heatwave is defined by the Australian Bureau of Meteorology (BOM) as 3 days or more of high maximum and minimum temperatures unusual for the location. During long heatwaves it is easy for workers to become dehydrated and for the body to become overheated. If this happens, medical conditions such as heat cramps, heat exhaustion or even heat stroke may develop.

Where a heatwave is declared by the BOM (Weather Warnings) the following steps should be implemented to reduce any potential risk:

- Workers who are exposed to outdoor work in a heatwave, or work in areas that subject them to high temperatures for long periods of time should be trained on the common health effects of heat related medical conditions;
- Workers should be monitored by a manager/supervisor for heat related medical conditions;
- Workers should wear lightweight, light coloured, loose, porous natural fibre clothes;
- Workers should drink plenty of water (preferably chilled), even if not thirsty and avoid caffeine;
- Work should be programmed to avoid strenuous activity, where this can not be achieved, work should be programmed in the early morning and late afternoon/evening, in a shaded area to avoid the hottest parts of the day;
- Workers conducting strenuous activity should be rotated regularly, or where not possible afforded regular breaks in air-conditioned areas (buildings, vehicles, cool down rooms); and
- Workers should avoid direct sunlight by performing work in shaded areas, wearing a hat (broad brim or legionnaires), long sleeves, long pants, and wearing sunscreen.

7.8.3 Cyclone

Refer to Veolia Severe Weather Procedure

7.8.4 Earthquake

- Raise the alarm and obtain assistance if required;
- Immediately notify the chief warden/ warden/manager/supervisor of the situation;
- If indoors, stay there;
- Seek shelter under a door frame, table or bench;
- If outdoors, keep well clear of buildings and other structures, power lines, trees, etc.;
- If in a vehicle, stop in an open area and listen to your car radio for advice;
- Do not use elevators or lifts; and

- Stay vigilant: expect aftershocks; keep your radio tuned to local media; watch for hazards and check for injuries or damage; turn off electricity, gas and water; only use telephones in an emergency; avoid driving unless for emergency.

7.9 Threats to Personnel Emergencies

7.9.1 Phone Threats Bomb/Chemical/Biological

For any threatening phone calls received, i.e. is bomb threats, chemical/biological threats:

- Keep the caller on the line for as long as possible;
- Obtain as much information from the caller as possible;
- Converse with the caller in a friendly manner, do not antagonise;
- Refer to the Bomb Threat Checklist asking as many questions as possible;
- Do not hang up even though the caller may have terminated the call;
- Attempt to attract another person's attention, indicate to them a bomb threat has been received;
- Advise the chief warden/warden as soon as possible who will contact the Police; and
- Follow instructions of the warden.

7.9.2 Threat by Mail or Other Communication

- Advise the chief warden/warden immediately;
- If a suspect item is discovered, do not touch;
- Discreetly ask people to leave the immediate area; and
- Prevent people from entering the area.

7.9.3 Unarmed/Armed Intruder or Holdup

Remember CODE A

- **C**alm – Try to remain calm;
- **O**bey – Obey offenders instructions, let offender know you are doing what they ask; Make no sudden movements;
- **D**escription – try to picture offender and any weapons;
- **E**vidence – Secure scene, touch nothing the offender may have touched; and
- **A**larm – activate alarm and call police when safe

If the situation warrants such action, contact the Police, dial 000 and provide the following information:

- Your name and location;
- The exact nature of the emergency;
- Any other relevant information, which may be of use to them; and
- Preserve the scene of the crime, do not disturb the area.

7.9.4 Abusive and Threatening Behaviour

- Do not volunteer any information;
- If you cannot retreat, remain where you are until help arrives; and
- Record your observations quickly, i.e. description of the offender including: facial description, speech mannerisms, height, tattoos, jewellery, weapons used, motor vehicle used, registration number if possible, direction of travel.

7.10 Neighbouring Site Related Emergencies

If an emergency occurs at a neighbouring site:

- Attempt to contact the neighbouring site;
- If the neighbouring site (Heron Resources, Infigen, Pylara and Cowley Hills) can not be contacted or has not notified Veolia Woodlawn of the emergency either directly or via the authorities, then the manager/supervisor (or other nominated person) will contact the emergency services to advise of the emergency;
- Manager/supervisor is to notify the chief warden/warden of situation;
- Chief warden/warden is activate or put on standby emergency response plan; and
- Where necessary notify other neighbouring sites of the emergency.

8. Emergency Communications

8.1 Initial Communications

Refer to the following sections:

- Contacting Emergency Services Phone 000;
- Site Emergency Contacts; and
- Notify management and SHEQ team

8.2 Notification of Appropriate Authorities and Organisations

The Manager/supervisor/SHEQ team shall be responsible for notifying appropriate regulatory authorities and organisations.

8.3 Notification to Site Neighbours of Emergency

If an emergency occurs at a Veolia site which may impact on the neighboring operations the neighbors listed in Appendix C Site neighbours are to be notified as appropriate. The Senior Manager where necessary shall be responsible for notifying appropriate organisations and neighbouring properties etc., who may not have been notified during the emergency.

8.4 Public relations and debriefing

No site worker is to communicate with any member of the media or public. Any external requests for information relating to the emergency from sources, other than local regulators or emergency services personnel will be directed to the Woodlawn Eco-Precinct Senior Manager, Henry Gundry. The Marketing and Communications team will prepare press releases or debriefings for neighbouring properties as required.

9. Termination of Emergency Response

Following any emergency situation, the decision to return to normal operations will be made by the SHEQ General Manager SHEQ GM, in consultation with site management and the attending emergency services.

9.1 Restarting Facilities

Before operations can be restarted after an emergency, the Senior Manager and LTP Supervisor for the site will confirm, using external resources if necessary, all equipment affected by the emergency has been inspected and is in a safe condition to restart operations.

9.2 Health assessment and Surveillance

Depending upon the nature of the emergency, products released, combustion products, environmental conditions at the time (i.e. wind direction, etc.), contaminated material etc., an evaluation should be made and documented by the Senior Manager in consultation with emergency services, doctors, and other medical specialists to determine if an initial health assessment and ongoing surveillance is required for persons who may have been at risk of exposure during the emergency.

9.3 Statutory Investigation

Depending on the nature and effects of the emergency, there may be a statutory investigation. Relevant government authorities may also require investigations. All requests for information or interviews must be referred to the SHEQ Gmr, who will coordinate the release of required information.

A listing of all personnel onsite at the time of the incident is extremely important should an investigation follow. The visitors register and the result of any headcount should be retained.

9.4 Internal Information Process

For any incident the manager/supervisor must complete a report in RIVO as soon as practicable. Depending on the scale of the incident the manager/supervisor is responsible for either completing or co-ordinating the investigation.

There is generally a requirement in insurance policies to report accidents, loss or potential loss events to the business's insurer. The manager/supervisor is responsible for ensuring this report is completed.

10. Terms and Definitions

Term	Definition
Appropriate Medical facility	In a non-emergency situation this will be the site's preferred medical provider.

Emergency	Emergency is defined as a sudden, urgent, and usually unexpected event or occurrence which threatens the safety or well being of workers, other stakeholders, and the environment and requires immediate action
Emergency Response Plan (ERP)	Emergency Response Plan- needs more of an explanation.
Worker	A person is a worker if the person carries out work in any capacity for Veolia, including work as: • Employee; • Contractor or subcontractor; • an worker of a contractor or subcontractor; • an worker of a labour hire company who has been assigned to work in the person's business or undertaking; • Outworker • Apprentice or trainee; • Student gaining work experience; and • Volunteer

11. Reference and Related Documents

Document Code/ Reference	Document Name
TBA	Crisis Management Procedure
TBA	Business Continuity Procedure
TBA	Emergency Management Procedure
TBA	Incident/Near Miss Management Procedure
TBA	Working at Heights Procedure
TBA	Chemical and Hazardous Materials Management
TBA	Severe Weather Procedure
TBA	Bomb Threat Checklist

12. Appendices

12.1 Appendix A LTP Emergency Contact List

12.2 Appendix B Fire Extinguisher Chart

12.3 Appendix C LTP Neighbours

12.4 Appendix D LTP Evacuation Diagram

12.5 Appendix E Eco-Precinct Location Plan

Appendix A Woodlawn LTP Site Emergency Contact List

Internal Contacts and External Contacts

Internal Contacts			
Contacts	**Name**	**Mobile**	**Landline**
Chief Warden	Henry Gundry	0400 233 592	(02) 8588 1364
Deputy Warden	David Figueiredo	0429 620 030	(02) 8588 1377
Area Warden (MBT)	Amila Wijedasa	0408 822 101	(02) 8588 1365
Area Warden (LTP)	Justin Conway	0447 301 734	(02) 8572 0310
Senior First Aid Officer	Ark Du		(02) 8588 1320
Senior First Aid Officer	David Figueiredo	0429 620 030	(02) 8588 1377
Senior First Aid Officer	Sureka Withanage	0448 165 504	(02) 8588 1378
Senior First Aid Officer	Harneet Puarr		(02) 8588 1372
Senior First Aid Officer	Glen Thompson	0427 312 815	
Senior First Aid Officer	Brian Soley		(02)8588 1382
Senior First Aid Officer	Rene Oosting	0408 432 569	(02) 8588 1371
Site Main Office	Reception		(02) 8588 1360
LTP Site Supervisor	Justin Conway	0447 301 734	(02) 8572 0310
Site Manager	David Figueiredo	0429 620 030	(02) 8588 1377
Site Senior Manager	Henry Gundry	0400 233 592	(02) 8588 1364
NSW SHEQ Advisor	John Wray	0419 908 472	
NSW Group SHEQ Manager	Justin Houghton	0448 830 798	
General Manager - HR/ER	Mark Whybrow	0467 814 943	(02) 9841 2952
Local Government	Goulburn Mulwaree		(02) 4823 4444

	Council		

Appendix A Woodlawn LTP Site Emergency Contact List External

External Contacts		
Contacts	**Function**	**Contact Number**
Police	Emergency	000 or (02) 4849 4411
Fire	Emergency	000 or (02) 4822 1608
Ambulance	Emergency	000
Bush Fire	NSW Rural Fire Services	1800 679 737
If there is no landline or mobile phone reception , call '112' from a mobile phone		
Marima medical centre	Preferred Medical Provider 23-25 Montague St, Goulburn NSW 2580	(02) 4821 9755
NSW State Emergency Services	Emergency	132 500 or (02) 4821 8333
Poisons Information Hotline	Information	13 11 26
Environment Protection Authority (EPA)	Reporting	132 555 or (02) 4224 4100
Department of Planning and Environment (DPE)	Reporting	(02) 9228 6111
Rural Lands Protection Board	Braidwood	(02) 4842 2536
Water NSW	Emergency/Faults	1800 061069

Appendix B Fire Extinguisher Chart

AS 2444-2001 Australian Standard Portable Fire Extinguishers and Fire Blankets – Selection and Location

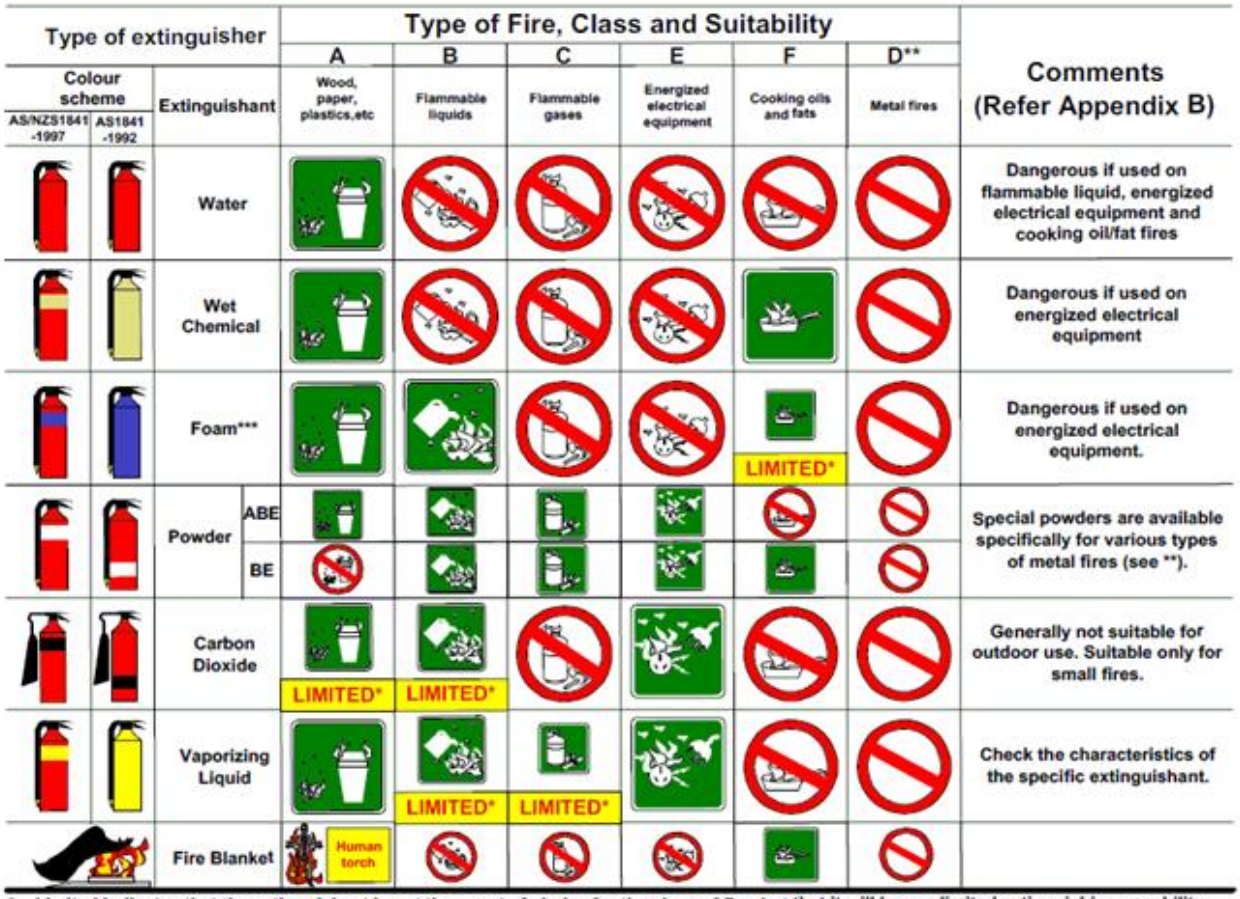

FIGURE A1 PORTABLE FIRE EXTINGUISHER/FIRE BLANKET SELECTION CHART

Appendix C Woodlawn LTP Neighbours

Site Neighbour	
Name of Company :	Veolia
Type of Operation:	Accomodation (Pylara and Cowley Hills)
Contact Name:	Henry Gundry
Contact Number:	0400 233 592
Geographical Location from site:	East of LTP
Site Neighbour	
Name of Company :	Heron Resources
Type of Operation:	Copper, Lead and Zinc Mine
Contact Name:	Reception Woodlawn Heron office
Contact Number:	4816 6320
Geographical Location from site:	East of LTP
Site Neighbour	
Name of Company :	Infigen
Type of Operation:	Wind farm
Contact Name:	Michael Johnson
Contact Number:	+61 2 8031 9959 or michael.johnson@infigenenergy.com
Geographical Location from site:	South-South-East of LTP

Appendix D Woodlawn LTP Evacuation Diagram (Plant layout)

Concept for information only

MGA NORTH

NORTH FACE
YOU ARE NOW ENTERING
WOODLAWN
BIOREACTOR

SOUTH FACE
YOU ARE NOW ENTERING
WOODLAWN
MINING LEASE

LTP SHED

EXIT

ASSEMBLY POINT

Legend

- Fire Extinguisher class A
- Fire Extinguisher class C
- Exit
- Emergency eye wash station/ shower
- Emergency Assembly Point

2m 0 5 10 15 20m
1:200 SCALE AT A0 SHEET SIZE

AMENDMENTS	DATE	ISSUE
ISSUED FOR CONSTRUCTION	05.12.17	0
ISSUED FOR TENDER	02.06.17	A

ARCHITECT

CLIENT: VEOLIA

PROJECT: WOODLAWN LEACHATE TREATMENT FEED

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
X.C	L.W.		G.R.	A0	AS SHOWN	12424.02-C60

Costin Roe Consulting Pty Ltd.
Consulting Engineers
Level 1, 8 Windmill Street
Walsh Bay, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3721
email: mail@costinroe.com.au

Costin Roe Consulting
PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE: SWEPT PATH PLAN

DRAWING No: C012424.02-C60 ISSUE: 0

Appendix D Woodlawn LTP Evacuation Diagram (LTP Shed)

Concept for information only

Legend

- Exit
- Fire Extinguisher class A
- Fire Extinguisher class E
- Emergency eye wash station/shower

22300

150 | 2850 | 5960 | 4190 | 4500 | 4500 | 150

2750

14300

EXIT

E

A

Roller Door 4000x4000

POLYMER DOSING

1186

3237

633

470

495

445

DOSING SKID

PHOSPHORIC ACID DOSING SKID

FUTURE DOSING SKID

ANTIFOAM DOSING SKID 2 OFF

1795 | 1795

3590

762

ELECTRICAL SWITCHBOARD ROOM

ULTRAFILTRATION

FEED PUMP CENTRIFUGE

Wash tank TNK434-01

Permeate tank TNK433-01

Permeate pumps PMP433-02 PMP433-03

Heat exchanger HXR423-01

Filter FLT420-04 FLT420-05

N6 N7 N8 N9 N10–N13

DISCHARGE CENTRATE PUMP

5000

CENTRIFUGE

POTABLE WATER BOOSTER STATION HYDRO SOLO E CRIE 10-5 3x400V

700

435

986

660

BORE WATER BOOSTER STATION HYDRO MPC-E 2 CRIE 10-5 U1 A-A-A-AG

SOFTENING UNIT

3500

FRESH WATER TANK

BORE WATER TANK 1

BORE WATER TANK 2

Ø150 TANK CENTER VENT

Ø150 FILL INLET

Ø150 HIGH + OUT Ø80 LOW + DRAIN

Ø150 + TANK 1 TO TANK 2 PIPE

Ø80 + DRAIN

INSPECTION OPENING

LEVEL TRANSDUCER

OUT Ø80

4500 | 4500 | 4500 | 150

150 | 4000 | 4500

22300

DRAWING CURRENT STATUS

IN PROGRESS

REV	REVISION	DRAWN	CHECKED	APPROVED	REVISION DATE
A_02	NEW SHED DRAWING DIM. UPDATED	WD	SM	-	27/02/2018
A_01	NEW SHED MANUFRACTURES DRAWING	WD	SM	-	19/01/2018
A_00	IN PROGRESS	WD	SM	-	18/01/2018

REFERENCE DRAWINGS:
REPLACES DRG: 00004-Z-00-D03-00-01

Water Treatment Australia Pty Ltd
CLARIFICATION – FILTRATION – CHEMICAL TREATMENT – WASTE WATER TREATMENT
ACN 004 804 040
17 Treforest Drive, Clayton, VIC 3168
Phone (03) 9543 1422 Fax (03) 9543 4036 Email wta@wta.net.au
7 Carlotta Street, Artarmon, NSW 2064
Phone (02) 9438 4099 Fax (02) 9436 3129 Email wtasyd@bigpond.com

Level 4, Bay Centre,
65 Pirrama Road
Pyrmont, NSW, 2009
Sydney, Australia.
Phone: +61 (2) 85710000
Web: www.veolia.com/anz
Email: reception.PYR@veolia.com

VEOLIA

DRAWN	WD	DATE	18/01/2018	
CHECKED	SM	DATE	18/01/2018	
APPROVED	-	DATE	-	

PROJECT: WOODLAWN LEACHATE TREATMENT PLANT
TITLE: LTP SHED LAYOUT PLAN
SCALE: NTS
SHEET: 01 OF 01
SIZE: A1
DRAWING No.: 2462-M-025
REVISION: A_02

PLOTTED 27/2/18 -11:48am
FILE-NO. 2462-M-025 RevA LTP

Appendix E Eco-Precinct Location Plan

Liability limited by a scheme approved under Professional Standards Legislation.

File Name: J:\Surveyors\Jobs\Veolia\16800 Engineering\CAD\16800-522 Woodlawn Eco-Precinct Site Plan - Main Operations Area with Aerial Issue B.dwg

VEOLIA ENVIRONMENTAL SERVICES

SCALE 1:4000

0 80 160 240 320 400

Metres

ISSUE	AMENDMENT	DRAWN	DATE
A	16800-521 ISSUE B WITH AERIAL PHOTO ADDED	MK	14/06/2018
B	SRF SITE RELOCATED & ED1 COFFER REMOVED	MK	18/06/2018

LandTeam Australia Pty Ltd
ABN 35 300 283 592
Goulburn Office
36 Montague Street
Postal: PO Box 1040
GOULBURN NSW 2580
p: (02) 4821 1033
e: goulburn@landteam.com.au
www.landteam.com.au
Integrated Management System

LandTeam

A1 SHEET

VEOLIA ENVIRONMENTAL SERVICES

WOODLAWN BIOREACTOR
COLLECTOR ROAD, TARAGO

PLAN SHOWING
WOODLAWN ECO PRECINCT INFRASTRUCTURE
PRIMARY OPERATIONS AREA
COLLECTOR ROAD, TARAGO

SURVEYED: N/A
DRAWN: MK
CHECKED: JK

ISSUE B

DRAWING No. 16800-522

DATUM N/A | CONTOUR INTERVAL N/A | DATE 18/06/2018

Appendix F Safety Data Sheet for Methanol, Phosphoric Acid and Caustic

1. IDENTIFICATION

Product Name	**Methanol**
Other Names	Methyl Alcohol; Methyl hydroxide; Pyroxylic Spirit; Wood alcohol
Uses	Manufacture of formaldehyde, acetic acid and dimethyl terephthatlate, chemical synthesis (methyl amines, methyl chloride, methyl methacrylate), antifreeze; solvent for nitrocellulose, ethylcellulose, polyvinyl butyral, shellac, rosin, manila resin, dyes; nenaturant for ethanol; dehydrator for natural gas; fuel for utility plants (methyl fuel); feedstock for manufacture of synthetic proteins by continuous fermentation; source of hydrogen for fuel cells; home- heating-oil extender.
Chemical Family	No Data Available
Chemical Formula	CH4O
Chemical Name	Methanol
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	2132A E. Dominguez Street Carson CA 90810 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	No. 8, Block G, Ground Floor, Taipan 2 Jalan PJU 1A/3 Ara Damansara 47301, Petaling Jaya, Selangor, Malaysia	+60-3-7843-6833

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) 6

Globally Harmonised System

Hazard Classification Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories

Flammable Liquids - Category 2
Acute Toxicity (Oral) - Category 3
Acute Toxicity (Inhalation) - Category 3
Acute Toxicity (Dermal) - Category 3
Specific Target Organ Toxicity (Single Exposure) - Category 1

Pictograms

Signal Word

Danger

Hazard Statements

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.

Precautionary Statements

Prevention	**P210**	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
	P233	Keep container tightly closed.
	P260	Do not breathe dust/fume/gas/mist/vapours/spray.
	P264	Wash skin thoroughly after handling.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
Response	**P301 + P310**	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
	P330	Rinse mouth.
	P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P307 + P311	IF exposed: Call a POISON CENTER or doctor/physician.
	P370 + P378	In case of fire: Use dry chemical, alcohol resistant foam or dry sand for extinction.
Storage	**P403 + P233**	Store in a well-ventilated place. Keep container tightly closed.
Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification

Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Methanol	No Data Available	67-56-1	100.00 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	Rinse mouth with water. Do NOT induce vomiting. Seek immediate medical attention. Do NOT delay.
Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes. Seek immediate medical attention.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor. Seek immediate medical attention.
Inhaled	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing. Seek immediate medical attention.
Advice to Doctor	Watch for toxic effects which may be delayed, including chemical pneumonitis. Contact Poison Information Centre for antidote treatment with ethyl alcohol. Central nervous system depression, and acidosis from methanol metabolites, including formaldehyde liver function and optic nerve, and other effects should be treated symptomatically.
Medical Conditions Aggravated by Exposure	No information available on medical conditions aggravated by exposure to this product.

5. FIRE FIGHTING MEASURES

General Measures	Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Keep out of low areas. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling. Earth containers when dispensing fluids. Move fire exposed containers from fire area if it can be done without risk.
Flammability Conditions	Extremely flammable liquid and Vapour.
Extinguishing Media	Dry agent, carbon dioxide, foam or water fog. Prevent contamination of drains or waterways. Alcohol resistant foam is the preferred firefighting medium. Use waterfog to cool intact containers and nearby storage areas.
Fire and Explosion Hazard	Vapour may form explosive mixtures with air. Vapours are heavier than air and may travel some distance to an ignition source and flash back.
Hazardous Products of Combustion	May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Special Fire Fighting Instructions	Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit.
Flash Point	12 °C Closed Cup
Lower Explosion Limit	6.7 %
Upper Explosion Limit	36.5 %
Auto Ignition Temperature	470 °C
Hazchem Code	•2WE

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Avoid accidents, clean up immediately. Increase ventilation. Avoid walking through spilled product as it is slippery when spilled. Use clean, non-sparking tools and equipment. Contact emergency services where appropriate.
Clean Up Procedures	Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar). When saturated collect material, transfer to suitable, labelled, dry chemical-waste containers and dispose of promptly as hazardous waste.
Containment	Stop leak if safe to do so. Isolate the area.
Environmental Precautionary Measures	Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management.
Evacuation Criteria	Evacuate all unnecessary personnel.
Personal Precautionary Measures	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

7. HANDLING AND STORAGE

Handling

Ensure an eye bath and safety shower are available and ready for use. O
bserve good personal hygiene practices and recommended procedures. Wash thoroughly after handling.
Take precautionary measures against static discharges by bonding and grounding equipment.
Avoid contact with eyes, skin and clothing.
Do not inhale product vapours.
Avoid prolonged or repeated exposure.
Before use carefully read the product label.
Prohibit eating, drinking and smoking in contaminated areas.

Storage

Store in a cool, dry, well-ventilated area.
Keep containers tightly sealed when not in use.
Inspect regularly for deficiencies such as damage or leaks.
Protect against physical damage.
Ground and bond storage containers.
Store away from incompatible materials as listed in section 10.
Store removed from oxidising agents, acids, alkalis, heat or ignition sources and foodstuffs.
Large storage areas should have appropriate fire protection systems.
This product has a UN classification of 1230, Dangerous Goods Class 3 (flammable), and Subsidiary Risk 6 (toxic) according to the Australian Code for the Transport of Dangerous Goods By Road and Rail.

Container

Store in original packaging as approved by manufacturer.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General

The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC);
Methanol CAS 67-56-1: TWA = 200ppm (262mg/m3) STEL = 250ppm (328mg/m3) 'Sk' Notice.

NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. 'Sk' Notice - Absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.
These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Exposure Limits

No Data Available

Biological Limits

Ingredient: Methanol
Reference: ACGIH BEI
Determinant: Methanol in urine
Sampling Time: End of shift
BEI: 15 mg/L

Engineering Measures

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended. Flammable/explosive vapours may accumulate in poorly ventilated areas. Vapours are heavier than air and may travel some distance to an ignition source and flash back. Maintain vapour levels below the recommended exposure standard.

Personal Protection Equipment

RESPIRATOR: Wear an approved respirator with suitable Type 'A' filter for organic gases and vapours. At high vapour levels, wear an Air-line respirator (AS1715/1716).
EYES: Wear a faceshield and safety glasses and splash-proof goggles. (AS1336/1337).
HANDS: Wear PVC or neoprene gloves. (AS2161).
CLOTHING: Chemical-resistant coveralls, PVC splash apron and safety footwear (AS3765/2210).

Work Hygienic Practices

No Data Available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State Liquid

Appearance Liquid

Odour Alcohol odour

Colour Clear, Colourless

pH No Data Available

Vapour Pressure	127 mmHg (@ 25 °C)
Relative Vapour Density	1.11 Air = 1
Boiling Point	64.7 °C
Melting Point	-97.7 °C
Freezing Point	-97.7 °C
Solubility	Soluble
Specific Gravity	0.79
Flash Point	12 °C Closed Cup
Auto Ignition Temp	470 °C
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	100%
VOC Volume	No Data Available
Additional Characteristics	No Data Available
Potential for Dust Explosion	Product is a liquid.
Fast or Intensely Burning Characteristics	Vapours are heavier than air and may travel some distance to an ignition source and flash back.
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	Vapours may form explosive mixtures with air.
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

General Information	Extremely flammable liquid and Vapour.
Chemical Stability	No Data Available
Conditions to Avoid	No Data Available
Materials to Avoid	Incompatible with oxidising agents (eg. hypochlorites), acids (eg. nitric acid), alkalis (eg. hydroxides), heat and ignition sources.
Hazardous Decomposition Products	May evolve toxic gases (carbon oxides, hydrocarbons) when heated to decomposition.
Hazardous Polymerisation	No Data Available

11. TOXICOLOGICAL INFORMATION

General Information

LC50 (inhalation) 50 g/m3/2 hours (mouse)
LCLo (inhalation) 1000 ppm (monkey)
LD50 (ingestion) 5628 mg/kg (rat)
LD50 (skin) 15,800 mg/kg (rabbit)
LDLo (ingestion) 143 mg/kg (human)
LDLo (skin) 393 mg/kg (monkey)
TCLo (inhalation) 300 ppm human (visual effects)
TDLo (ingestion) 3429 mg/kg (man-visual change)

This product has the potential to cause adverse health effects.

Use safe work practices to avoid eye or skin contact and inhalation. Methanol primarily affects the central nervous system, with symptoms of headache, nausea, vomiting and dizziness. Damage to the optic nerves may occur with chronic or high level exposure, causing visual problems and possible blindness.

Experimental teratogen

EyeIrritant Moderate irritant. Contact may result in watering of the eyes, stinging or blurred vision and sensitivity to light.

Ingestion Toxic if swallowed. Toxic : danger of very serious irreversible effects if swallowed. Ingestion can result in nausea, vomiting, severe abdominal pain, back pain, central nervous system effects including optic nerve damage (hyperaemia etc), convulsions, blindness, loss of consciousness and ultimately proceed to coma and death. See "chronic" effects.

Inhalation Toxic y inhalation. Toxic : danger of very serious irreversible effects through inhalation. Over exposure to vapours may result in mucous membrane irritation of the respiratory tract. Inhalation of vapour may result in headache, nausea, central nervous system effects and visual impairment, possibly blindness. Continued exposure can result in health effects as per ingestion.

SkinIrritant Toxic in contact with skin. Toxic : danger of very serious irreversible effects in contact with skin. Irritant. Contact may result in drying and defatting of the skin. May be absorbed through skin with harmful effects.

Carcinogen Category No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic toxicity:
Arthropoda toxicity No effect level (Daphnia) is 10 g/L/48 hours.
Fish toxicity: TLm (Trout) is 8000 mg/L/48 hours.
Amphibian toxicity: LDlo (frog) = 59 gm/kg.

Chronic aquatic toxicity possible above 32 ppm.

Persistence/Degradability It is expected to biodegrade in both soil and water.

Mobility If spilt on soil it is expected to be susceptible to significant leaching, as well rapid evaporation from dry surfaces is likely to occur.

Environmental Fate Avoid contaminating waterways, drains and sewers.
If released to the atmosphere methanol degrades via reaction with photochemically produced hydroxyl radicals.

Bioaccumulation Potential No Data Available

Environmental Impact No Data Available

13. DISPOSAL CONSIDERATIONS

General Information Dispose of in accordance with all local, state and federal regulations.
All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.

Special Precautions for Land Fill Contact a specialist disposal company or the local waste regulator for advice.
Wearing the protective equipment outlined, ensure all ignition sources are extinguished.
For small quantities, absorb on paper, sand or similar and evaporate under a fume cupboard or open area.
For large volumes, atomise into incinerator (mixing with more flammable solvent if required) or recycle by gravimetric separation, distilling & reusing.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG

Proper Shipping Name	METHANOL
Class	3 Flammable Liquids
Subsidiary Risk(s)	6.1 Toxic and Infectious Substances - Toxic Substances
EPG	16 Liquids - Highly Flammable, Toxic
UN Number	1230
Hazchem	•2WE
Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	METHANOL
Class	3 Flammable Liquids
Subsidiary Risk(s)	6.1 Toxic and Infectious Substances - Toxic Substances
UN Number	1230
Hazchem	2WE
Pack Group	II
Special Provision	No Data Available
EMS	FE,SD
Marine Pollutant	No

Air Transport
IATA

Proper Shipping Name	METHANOL
Class	3 Flammable Liquids
Subsidiary Risk(s)	6.1 Toxic and Infectious Substances - Toxic Substances
UN Number	1230
Hazchem	2WE
Pack Group	II
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information No Data Available

Poisons Schedule (Aust)	6

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Not Determined
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	METHAB1000, METHAB3500, METHAB3501, METHAN1000, METHAN1001, METHAN1002, METHAN1003, METHAN1004, METHAN1005, METHAN1006, METHAN1007, METHAN1008, METHAN1009, METHAN1010, METHAN1011, METHAN1012, METHAN1013, METHAN1014, METHAN1015, METHAN1016, METHAN1017, METHAN1018, METHAN1019, METHAN1020, METHAN1021, METHAN1022, METHAN1023, METHAN1024, METHAN1500, METHAN2000, METHAN2001, METHAN2002, METHAN2003, METHAN2100, METHAN2500, METHAN2700, METHAN2800, METHAN2900, METHAN3000, METHAN3001, METHAN3100, METHAN3200, METHAN3300, METHAN3400, METHAN3500, METHAN3600, METHAN4000, METHAN4100, METHAN5000, METHAN5001, METHAN5100, METHAN5101, METHAN5200, METHAN5300, METHAN5500, METHAN6500, METHAN6501, METHAN6502, METHAN6503, METHAN6504, METHAN6505, METHAN6506, METHAN6507, METHAN7000, METHAN7900, METHAN1800, METHAN1801, METHAN1802, METHAN1803, METHAN1804, METHAN1805, METHAN1806, METHAN1807, METHAN1808, METHAN1809, METHAN1810, METHAN1811, METHAN1812, METHAN1813, METHAN1814, METHAN1815, METHAN1816, METHAN1817, METHAN1818, METHAN1819, METHAN1820, METHAN1821, METHAN1822, METHAN1823, METHAN1824, METHAN1825, METHAN1826, METHAN1827, METHAN1828, METHAN1829, METHAN1830, METHAN1831, METHAN1832, METHAN1833, METHAN1834, METHAB3502, METHAN1025, METHAN3150, METHAN3002, METHAN3005, METHAN1030, METHAN3010, METHAN3020, METHAN3030, METHAN3040, METHAN3050, METHAN3060, METHAN3071, METHAN3072, METHAN3070, METHAN3081, METHAN3082, METHAN3080, METHAN3090, METHAN2050, METHAN4010, METHAN4015
Revision	2
Revision Date	19 Sep 2012
Key/Legend	**<** Less Than **>** Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm²** Square Centimetres

CO2 Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm³ Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m³ Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight

1. IDENTIFICATION

Product Name	**Phosphoric Acid, 75-95%**
Other Names	Orthophosphoric Acid; PHOSPHORIC ACID; White Phosphoric Acid
Uses	To be as acidulous additive of coke type beverage and some other soft drink; foodstuff fermenting agent. To be as neutralized settling agent in the edible oil and fat industry. To be as some kinds of important additive of toothpaste and animal subsidiary feed. To be used to produce a variety of food grade phosphate; to be as food amending agent, nutrition hardening agent and leavening agent.
Chemical Family	No Data Available
Chemical Formula	H3PO4
Chemical Name	Phosphoric Acid, 75-95%
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	2132A E. Dominguez Street Carson CA 90810 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) 6

Globally Harmonised System

Hazard Classification			Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
Hazard Categories			Serious Eye Damage/Irritation - Category 1
			Skin Corrosion/Irritation - Category 1A
			Acute Toxicity (Dermal) - Category 5
			Acute Toxicity (Oral) - Category 4
Pictograms			
Signal Word			Danger
Hazard Statements		**H302**	Harmful if swallowed.
		H313	May be harmful in contact with skin.
		H314	Causes severe skin burns and eye damage.
		H318	Causes serious eye damage.
Precautionary Statements	Prevention	**P234**	Keep only in original container.
		P260	Do not breathe fume/gas/mist/vapours/spray.
		P264	Wash hands thoroughly after handling.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	**P301 + P330 + P331**	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P303 + P361 + P353	IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P310	Immediately call a POISON CENTER or doctor/physician.
		P321	Specific treatment (see First Aid Measures on Safety Data Sheet).
		P363	Wash contaminated clothing before reuse.
		P390	Absorb spillage to prevent material damage.
	Storage	**P405**	Store locked up.
		P406	Store in corrosive resistant container with a resistant inner liner.
	Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification			Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	**6.1D**	Substances that are acutely toxic - Harmful
		6.1E	Substances that are acutely toxic –May be harmful, Aspiration hazard
		8.1A	Substances that are corrosive to metals
		8.3A	Substances that are corrosive to ocular tissue

	8.2C	Substances that are corrosive to dermal tissue UN PGIII
Environmental Hazards	**9.1D**	Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action
	9.3C	Substances that are harmful to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Phosphoric Acid	No Data Available	7664-38-2	75.0 - 95.0 %
Water	No Data Available	7732-18-5	Balance to 100% %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed Rinse mouth with water. Give water to drink provided person is conscious. Do NOT induce vomiting. Seek medical attention immediately.

Eye Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Seek immediate medical attention.

Skin Remove contaminated clothing. Wash affected area with plenty of flowing clean water for at least 15 minutes. Seek immediate medical attention. Wash clothing before reuse. If burned, treat as burn by acid.

Inhaled Remove victim from exposure to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical advice.

Advice to Doctor Treat symptomatically based on judgement of doctor and individual reactions of patient.
NOTE: Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning.
The symptoms should not be mistaken for heat exhaustion or smoke inhalation.

Medical Conditions Aggravated by Exposure No information available on medical conditions aggravated by exposure to this product.
SIGNS AND SYMPTOMS OF EXPOSURE: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. May cause cyanosis (blue-grey coloring of skin and lips caused by lack of oxygen). Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.
TARGET ORGAN INFORMATION: Bone marrow. Blood. Liver.
ROUTE OF EXPOSURE: Multiple Routes: May be harmful by inhalation, ingestion, or skin absorption.

5. FIRE FIGHTING MEASURES

Flammability Conditions Product is a non-flammable liquid.

Extinguishing Media In case of fire, use Carbon dioxide, dry chemical powder, or appropriate foam.

Hazardous Products of Combustion Non-combustible liquid. Incompatible with strong oxizing agents, strong reducing agents, strong alkali, ative powdered metals, Fluorine, sulfur trioxide, phosphorus pentoxide, metals, and sources of ignition. This product will release hydrogen on contact with metals, which may cause explosion in the air. Reacts with water to generate heat and form phosphoric acid. The reaction is not violent. Emits toxic fumes under fire conditions. It will produce the virulent gas of oxidation phosphorus at a high temperature. It is corrosive.
Hazardous decomposition products may include Phosphine, oxides of phosphorus, and hydrogen gas.

Personal Protective Equipment Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit. Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas.
Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.

Flash Point No Data Available

Lower Explosion Limit No Data Available

Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2R

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Personnel involved in the clean up should wear full protective clothing as listed in section 8. Avoid accidents, clean up immediately. Evacuate all unnecessary personnel. Increase ventilation. Avoid walking through spilled product as it is slippery when spilt. Stop leak if safe to do so. Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. Use clean, non-sparking tools and equipment. Shut off all possible sources if ignition.
Clean Up Procedures	Neutralize spilled product with lime or soda. Soak up using absorbent material such as sand or soil. When saturated, collect material and transfer to a to suitable, labelled, dry chemical-waste containers and dispose of promptly as hazardous waste. Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Handling	Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid contact with eyes, skin and clothing. Do not inhale product vapours. Avoid prolonged or repeated exposure. Remove contaminated clothing and wash before reuse. Use only in a chemical fume hood.
Storage	Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Protect from direct sunlight, moisture, fire, and heat. Store away from alkali, H vesicant, tinder, active metal powder. This product has a UN classification of 1805 and a Dangerous Goods Class 8 (Corrosive) according to The Australian Code for the Transport of Dangerous Goods By Road and Rail.
Container	Container type/packaging must comply with all applicable local legislation. Store in original packaging as approved by manufacturer.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC); Phosphoric Acid CAS: 7664-38-2 TWA = 1mg/m3 STEL = 3mg/m3 NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.
Exposure Limits	No Data Available
Biological Limits	No information available on biological limit values for this product.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	RESPIRATOR: Wear an approved full face piece respirator with suitable filter for acid gases and vapours if engineering controls are inadequate (AS1715/1716). EYES: Chemical goggles to prevent splashing in the eyes (AS1336/1337). HANDS: Rubber or neoprene impervious gloves (AS2161). CLOTHING: Chemical-resistant coveralls and safety footwear (AS3765/2210).
Work Hygienic Practices	No Data Available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Viscous Liquid
Odour	Odourless
Colour	Transparent, Colourless
pH	1.5
Vapour Pressure	5.65 to 2.16mmHg torr (@ 20 °C)
Relative Vapour Density	No Data Available
Boiling Point	135 - 158 °C
Melting Point	<15
Freezing Point	<15 °C
Solubility	No Data Available
Specific Gravity	Density: 1.58-1.69
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	Softening Point: 42.4 Deg C (pure)
Potential for Dust Explosion	Product is a liquid.
Fast or Intensely Burning Characteristics	No Data Available
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	Contact with reactive metals may evolve highly flammable hydrogen gas.
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of use, storage and temperature.

Chemical Stability	Corrosive Liquid. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid	Avoid excessive heat, direct sunlight, moist air or water.
Materials to Avoid	Incompatible with strong oxizing agents, strong reducing agents, strong alkali, ative powdered metals, Fluorine, sulfur trioxide, phosphorus pentoxide, metals, and sources of ignition.
Hazardous Decomposition Products	This product will release hydrogen on contact with metals, which may cause explosion in the air. Reacts with water to generate heat and form phosphoric acid. The reaction is not violent. Emits toxic fumes under fire conditions. It will produce the virulent gas of oxidation phosphorus at a high temperature. It is corrosive. Hazardous decomposition products may include Phosphine, oxides of phosphorus, and hydrogen gas.
Hazardous Polymerisation	Hazardous Polymerization May occur. Reacts with water to generate heat and form phosphoric acid. The reaction is not violent. Reacts with Bases.

11. TOXICOLOGICAL INFORMATION

General Information	Oral LD50 Rat : 1530mg/Kg Dermal LD50 Rabbit : 2740mg/Kg
EyeIrritant	Causes burns. Corrosive. Causes tissue destruction, permanent damage to the cornea, blindness.
Ingestion	Causes burns. Harmful by ingestion. Can cause nausea, diarrhea, corrosion, burns to mouth and esophagus, abdominal pain, chest pain, shortness of breath, seizures, and death.
Inhalation	Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical phenomenon, and pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. May be harmful by inhalation. Mists may cause lung irritation, shortness of breath, fluid in lungs.
SkinIrritant	Causes burns. Causes irritation, burns.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	No ecological information available for this product.
Persistence/Degradability	No information available on persistence/degradability for this product.
Mobility	No information available on mobility for this product.
Environmental Fate	Do NOT let product reach waterways, drains and sewers.
Bioaccumulation Potential	No information available on bioaccumulation for this product.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.
Special Precautions for Land Fill	Contact a specialist disposal company or the local waste regulator for advice.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION

Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

Land Transport (Fiji)
NZS5433

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

Land Transport (Papua New Guinea)
NZS5433

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1805
Hazchem	2R
Pack Group	III

Special Provision	No Data Available

Land Transport (Philippines)

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

Sea Transport
IMDG

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available
EMS	FA,SB
Marine Pollutant	No

Air Transport
IATA

Proper Shipping Name	PHOSPHORIC ACID, SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1805
Hazchem	2R
Pack Group	III
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001545

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	PHACID0100, PHACID0101, PHACID0102, PHACID0103, PHACID0104, PHACID0105, PHACID0106, PHACID0107, PHACID0200, PHACID0201, PHACID0300, PHACID0400, PHACID0401, PHACID0402, PHACID0403, PHACID0404, PHACID0600, PHACID0601, PHACID0602, PHACID0603, PHACID0700, PHACID0701, PHACID0702, PHACID0800, PHACID0801, PHACID0802, PHACID0803, PHACID0804, PHACID0805, PHACID0900, PHACID0901, PHACID0902, PHACID1000, PHACID1001, PHACID1002, PHACID1003, PHACID1004, PHACID1005, PHACID1006, PHACID1007, PHACID1008, PHACID1009, PHACID1010, PHACID1011, PHACID6050, PHACID1013, PHACID1014, PHACID1015, PHACID1016, PHACID1017, PHACID1018, PHACID1019, PHACID1020, PHACID1021, PHACID1022, PHACID1023, PHACID1024, PHACID1025, PHACID1026, PHACID1027, PHACID1028, PHACID1029, PHACID1030, PHACID1031, PHACID1032, PHACID1033, PHACID1034, PHACID1035, PHACID1036, PHACID1037, PHACID1038, PHACID1039,

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Revision 2

Revision Date 21 Jun 2013

Key/Legend

< Less Than
> Greater Than
AICS Australian Inventory of Chemical Substances
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm² Square Centimetres

CO2 Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm³ Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m³ Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight

1. IDENTIFICATION

Product Name	**Caustic Soda/Caustic Potash Blend**
Other Names	No Data Available
Uses	Freezing point suppressant.
Chemical Family	No Data Available
Chemical Formula	No Data Available
Chemical Name	Caustic Soda/Caustic Potash Blend
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	2132A E. Dominguez Street Carson CA 90810 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	No. 8, Block G, Ground Floor, Taipan 2 Jalan PJU 1A/3 Ara Damansara 47301, Petaling Jaya, Selangor, Malaysia	+60-3-7843-6833

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) 6

Globally Harmonised System

Hazard Classification Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories			Corrosive to Metals - Category 1
			Acute Toxicity (Oral) - Category 4
			Skin Corrosion/Irritation - Category 1A
			Serious Eye Damage/Irritation - Category 1
Pictograms			
Signal Word			Danger
Hazard Statements		**H290**	May be corrosive to metals.
		H302	Harmful if swallowed.
		H314	Causes severe skin burns and eye damage.
		H318	Causes serious eye damage.
Precautionary Statements	Prevention	**P234**	Keep only in original container.
		P264	Wash exposed skin thoroughly after handling.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	**P303 + P361 + P353**	IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
		P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P312	Call a POISON CENTER or doctor/physician if you feel unwell.
		P390	Absorb spillage to prevent material damage.
	Storage	**P405**	Store locked up.
	Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	**6.1D**	Substances that are acutely toxic - Harmful
		8.1A	Substances that are corrosive to metals
		8.2A	Substances that are corrosive to dermal tissue UN PGI
		8.3A	Substances that are corrosive to ocular tissue
	Environmental Hazards	**9.1D**	Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action
		9.3C	Substances that are harmful to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
	H2O	7732-18-5	53.8 %
Sodium Hydroxide	NaOH	1310-73-2	41.4 %
Potassium Hydroxide	KOH	1310-58-3	4.8 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed Rinse mouth. Do NOT induce vomiting. If within a few minutes after ingestion, one small glass of water may be given to drink. Refer immediately for medical attention.

Eye First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Skin Remove contaminated clothes. Rinse skin with plenty of water or shower for at least 15 minutes. Refer immediately for medical attention.

Inhaled Fresh air, rest. Refer immediately for medical attention. Move victim to fresh air. Call emergency medical service. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth methods if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Consult a doctor or call POISON CONTROL centre. Take the product container or safety data sheet with you.

Advice to Doctor Indication of immediate medical attention and special treatment needed : Give artificial respiration if victim is not breathing but not mouth to mouth. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. Obtain immediate medical attention.

Medical Conditions Aggravated by Exposure Serious local effects by all routes of exposure- inhalation, ingestion, skin and/or eye contact. Acute toxicity, irritation eyes, skin, respiratory system; cough, sneezing; eye, skin burns; vomiting, diarrhoea.

5. FIRE FIGHTING MEASURES

General Measures If safe to do so, remove containers from the path of fire.

Flammability Conditions No Data Available

Extinguishing Media In case of fire in the surroundings, use appropriate extinguishing media. Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use water in flooding quantities as fog. Apply water from as far a distance as possible. Use "alcohol" foam, dry chemical or carbon dioxide. Keep run-off water out of sewers and water sources.

Fire and Explosion Hazard Non-combustible liquid. Not considered to be a fire hazard or an explosion hazard.

Hazardous Products of Combustion Hazardous decomposition products may include noxious and toxic fumes of carbon monoxide and carbon dioxide.

Special Fire Fighting Instructions Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.

Personal Protective Equipment Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit.
Please note: Structural fire fighters uniform will provide limited protection.

Flash Point No Data Available

Lower Explosion Limit No Data Available

Upper Explosion Limit No Data Available

Auto Ignition Temperature No Data Available

Hazchem Code 2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Hazards from spills and leaks should be minimized by an adequate supply of water for washing-down. Adequate ventilation should be provided in areas where caustic soda mist or dust is present. For the protection of the eyes, safety goggles should be worn, as well as face shields, if complete face protection is necessary. Eyewash fountains and safety showers must be available at any location where eye and/or skin contact can occur. Protection against mist or dust of this compound can be provided by filter or dust-type respiratory protective equipment. Safety shoes are recommended.
Clean Up Procedures	Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into covered plastic containers. Carefully collect remainder. Then store and dispose of according to local regulations.
Containment	Stop leak if safe to do so.
Environmental Precautionary Measures	The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal and plant life; and conformance with environmental and public health regulations
Evacuation Criteria	Evacuate all unnecessary personnel.
Personal Precautionary Measures	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

7. HANDLING AND STORAGE

Handling	Plastics and plastic-lined steel are now available as construction materials. Mild steel is adequate for almost all caustic-handling applications. Keep container closed when not in use. Exercise great care in handling potassium hydroxide, as it rapidly destroys tissue. Do not handle with bare hand. Wash hands thoroughly after any skin contact. Avoid inhalation or contact with eye and skin. Do not ingest.
Storage	Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Protect from direct sunlight, moisture and static discharges. Do NOT allow material to dry out. Avoid heat, freezing and ultra- violet light. Keep away from food, drink, and animal feeding stuffs. This product has a UN classification of 3266 and a Dangerous Goods Class 8 (Corrosive) according to The Australian Code for the Transport of Dangerous goods By Road and Rail.
Container	Store only in original packaging as approved by manufacturer.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	Safe Work Australia, TWA : Sodium Hydroxide, 2 Peak limitation, 2 mg/m3, 8 hours Potassium Hydroxide, 2 Peak limitation, 2 mg/m3, 8 hours Sodium Hydroxide, 2mg/m³ (ceiling value) Potassium Hydroxide, 2mg/m³ (ceiling value)
Exposure Limits	No Data Available
Biological Limits	No information available on biological limit values for this product.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Adequate ventilation should be provided so that exposure limits are not exceeded.
Personal Protection Equipment	RESPIRATOR: Wear a positive-pressure,self-contained breathing apparatus for planned entry into unknown concentrations or in case of emergency (AS1715/1716). EYES: Safety glasses with side shields (AS1336/1337). HANDS: Wear impervious protective gloves (AS2161). CLOTHING: Flame-retardant coveralls and anti-static footwear (AS3765/2210).
Work Hygienic Practices	No Data Available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Clear solution
Odour	No specific odour
Colour	Colourless
pH	13.0 - 14.0
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	Soluble
Specific Gravity	No Data Available
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	1.48-1.49
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No Data Available
Potential for Dust Explosion	No Data Available
Fast or Intensely Burning Characteristics	No Data Available
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	No Data Available
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

Chemical Stability	Soluble in water. Dissolution can liberate enough heat to cause steaming and spattering and ignite adjacent combustible material Slowly absorbs carbon dioxide from the air to give solid products as crusts or precipitates. Water soluble. Dilution with water liberates heat, possibly enough to cause local boiling and spattering. Generates considerable heat when solution is mixed with acid. Acids, water, metals (when wet),

	halogenated hydrocarbons, maleic anhydride [Note: Heat is generated if KOH comes in contact with water & carbon dioxide from the air].
Conditions to Avoid	Avoid excessive heat, direct sunlight, moisture, static discharges and high temperatures
Materials to Avoid	Incompatible with strong oxidising agents, bases, mineral acids and sources of ignition.
Hazardous Decomposition Products	No Data Available
Hazardous Polymerisation	Hazardous Polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	Sodium Hydroxide: LD50 Oral (Rat), 140-340 mg/kg Sodium Hydroxide: LC50 inhalation (Mouse), 39,000 mg/m3/4 hrs. Potassium Hydroxide: LD50 Oral (Rat), 265 mg/kg Caustic Blend : Not known to be a skin sensitizer. There is no risk for developmental toxicity and no risk for toxicity to reproduction. Both in vitro and in vivo genetic toxicity tests indicated no evidence for a mutagenic activity. No confirmed data available on carcinogenicity. STOT- single exposure and repeated exposure not known. Potassium Hydroxide : Not known to be a skin sensitizer. No evidence for a mutagenic activity. No risk for reproductive toxicity is expected. There is no evidence KOH to be carcinogenic in exposure situations that are relevant for man. STOT- single exposure and repeated exposure not known.
EyeIrritant	The substance is very corrosive to the eyes.
SkinIrritant	Caustic Blend : The substance is corrosive to the skin. Repeated or prolonged contact with skin may cause dermatitis. When caustic soda comes into contact with the skin it does not usually cause immediate pain, but it does start to cause immediate damage. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.Effects of contact may be delayed.
Ingestion	Corrosive on ingestion. Caustic dusts are irritating to the upper respiratory system. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Corrosive on ingestion. Swallowing caustic alkalis /potassium hydroxide/ causes immediate burning pain in the mouth, throat, and stomach, and the lining membranes become swollen and detached. Vomiting and purging may occur.
Inhalation	The substance is corrosive to the respiratory tract. Prolonged exposure to high concentrations may cause discomfort and ulceration of nasal passages. Effects of contact or inhalation may be delayed.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	Sodium Hydroxide : LC50; freshwater, static, Carassius auratus (Goldfish), 160 mg/L for 24 hrs. Potassium Hydroxide :LC50, Carassius auratus (Goldfish), 224 mg/L for 24 hrs.
Persistence/Degradability	Sodium Hydroxide : Sodium persists indefinitely in the environment. The hydroxyl ion can be neutralized by acids, it can form complexes or it can be precipitated. Biological oxygen demand: None. Potassium Hydroxide : Biodegradation and Photodegredation: Not available.
Mobility	Sodium Hydroxide : The high water solubility and low vapour pressure indicate that NaOH will be found predominantly in water. In soil, mobility depends directly on the importance of the liquid phase of the soil and the possibility to form metal hydroxo-complexes with metal solid species. Potassium Hydroxide : The high water solubility and low vapour pressure indicate that KOH will be found predominantly in the aquatic environment. KOH is present in the environment as potassium and hydroxyl ions, which implies that it will not adsorb on particulate matter or surfaces and will not accumulate in living tissues.
Environmental Fate	Adverse effects on the aquatic environment are not expected due to production or use of NaOH.
Bioaccumulation Potential	Sodium Hydroxide : Considering its high water solubility, NaOH is not expected to bioconcentrate in organisms. Potassium Hydroxide : Not applicable.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility

Special Precautions for Land Fill Contact a specialist disposal company or the local waste regulator for advice. Incinerate at an approved site following all local regulations. This material may be suitable for approved landfill.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG

Proper Shipping Name	Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	3266
Hazchem	2X
Pack Group	II
Special Provision	274

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	3266
Hazchem	2X
Pack Group	II
Special Provision	274

Land Transport (New Zealand)
ADR Code

Proper Shipping Name	Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	3266
Hazchem	2X
Pack Group	II
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	3266
Hazchem	2X
Pack Group	II

Special Provision	No Data Available

Sea Transport
IMDG

Proper Shipping Name	Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	3266
Hazchem	2X
Pack Group	II
Special Provision	274
EMS	F-A, S-B
Marine Pollutant	No

Air Transport
IATA

Proper Shipping Name	Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	3266
Hazchem	2X
Pack Group	II
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	6

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001547

National/Regional Inventories

Australia (AICS)	Not Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined

Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Not Determined
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	CAUSOD0100, CAUSOD0101, CAUSOD0105
Revision	1
Revision Date	01 Jan 2016
Reason for Issue	New SDS
Key/Legend	**<** Less Than **>** Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm²** Square Centimetres **CO2** Carbon Dioxide **COD** Chemical Oxygen Demand **deg C (°C)** Degrees Celcius **EPA (New Zealand)** Environmental Protection Authority of New Zealand **deg F (°F)** Degrees Farenheit **g** Grams **g/cm³** Grams per Cubic Centimetre **g/l** Grams per Litre **HSNO** Hazardous Substance and New Organism **IDLH** Immediately Dangerous to Life and Health **immiscible** Liquids are insoluable in each other. **inHg** Inch of Mercury **inH2O** Inch of Water **K** Kelvin **kg** Kilogram **kg/m³** Kilograms per Cubic Metre **lb** Pound **LC50** LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. **LD50** LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. **ltr** or **L** Litre **m³** Cubic Metre **mbar** Millibar **mg** Milligram **mg/24H** Milligrams per 24 Hours **mg/kg** Milligrams per Kilogram **mg/m³** Milligrams per Cubic Metre **Misc** or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present. **mm** Millimetre

mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight