
Appendix E

Hazards and risk assessment

DARGUES MINE WATER TREATMENT FACILITIES

HAZARDS AND RISKS

SEPP (RESILIENCE AND HAZARDS) SCREENING STUDY

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Title:
Dargues Mine Water Treatment Facilities
Hazards and Risks
SEPP (Resilience and Hazards) Screening Study

QA verified:
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Date: 06-Mar-2025

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ABBREVIATIONS

ADGC	Australian Dangerous Goods Code
BIM	Big Island Mining Pty Ltd
DG	Dangerous Goods
DPHI	Department of Planning, Housing and Infrastructure
GHS	Global Harmonised System
HIPAP	Hazardous Industries Planning Advisory Paper
LEP	Local Environmental Plan
LGA	Local Government Area
NSW	New South Wales
PHA	Preliminary Hazard Analysis
SDS	Safety Data Sheet
SEPP	State Environmental Planning Policy
TSF	Tailings Storage Facility

1. INTRODUCTION

1.1. Background

Big Island Mining Pty Ltd (BIM), a wholly owned subsidiary of Aurelia Metals Ltd, is proposing to treat the water in the Tailings Storage Facility (TSF) at Dargues Reef Mine prior to discharging into the underground mine (the Proposal). BIM retained Victory Engineering to provide concepts for the design of the treatment facilities.

EMM Consulting Pty Ltd (EMM) is writing a modification report under the approved modified State Significant Development MP10_0054 and has retained Sherpa Consulting Pty Ltd (Sherpa) to address hazard and risk issues arising from the water treatment facilities.

1.2. Objectives

This report forms the preliminary risk screening in accordance with Chapter 3 of the *State Environmental Planning Policy (SEPP) (Resilience and Hazards)* (Resilience and Hazards SEPP), Ref [1]. The objectives of the preliminary risk screening were to:

1. determine whether the Proposal is considered 'potentially hazardous' within the meaning of the Resilience and Hazards SEPP
2. establish whether a Preliminary Hazard Analysis (PHA) is required and document the basis for the decision.

The New South Wales (NSW) Department of Planning, Housing and Infrastructure (DPHI) screening guideline *Hazardous & Offensive Development Application Guidelines – Applying SEPP 33*, Ref [2], was used to undertake the preliminary risk screening¹.

1.3. Scope

The scope of the preliminary risk screening covered:

- storage and handling of chemicals with Dangerous Goods (DG) classification associated with the Proposal
- DG transport movements to-and-from the site associated with the Proposal
- review of the general requirements of the *Applying SEPP 33* guideline.

1.4. Exclusions and limitations

The exclusions and limitations that apply to this report are summarised in Table 1.1.

¹ SEPP No. 33 Hazardous and Offensive Development has been revoked and incorporated as Chapter 3 of the Resilience and Hazards SEPP (2021). For the preliminary risk screening, the guidance document *Applying SEPP 33* still applies.

Table 1.1: Exclusions and limitations

Item	Scope area	Exclusion/limitation
1	Post approval activities	Exclusion: Post approval activities described in the <i>Applying SEPP 33</i> guideline such as the Final Hazard Analysis, Fire Safety Study and Construction Safety Study are excluded.
2	Site visits, meetings and consultation	Exclusion: The scope excluded site visits; community consultation; regulatory meetings and responses to comments post public exhibition or during regulator reviews.

2. SITE INFORMATION

2.1. Site location and context

The Dargues Gold Mine is located in Jembaicumbene, NSW 2622, on the western slopes of the Great Dividing Range and approximately 60 km south-east of Canberra. The site is situated to the north of Majors Creek and approximately 13 km south of Braidwood in the Queanbeyan-Palerang Regional Local Government Area (LGA).

The site is located on land zoned 'RU1 Primary Production' under the Queanbeyan-Palerang Regional Local Environmental Plan (LEP) 2022. The immediate site context is industrial in nature. The nearest identified non-industrial land uses include:

- Majors Creek ('RU5 Village'), approx. 2 km south
- the Majors Creek State Conservation Area ('C1 National Parks and Nature Reserves'), approx. 2.5 km south-west.

2.2. Modification proposal

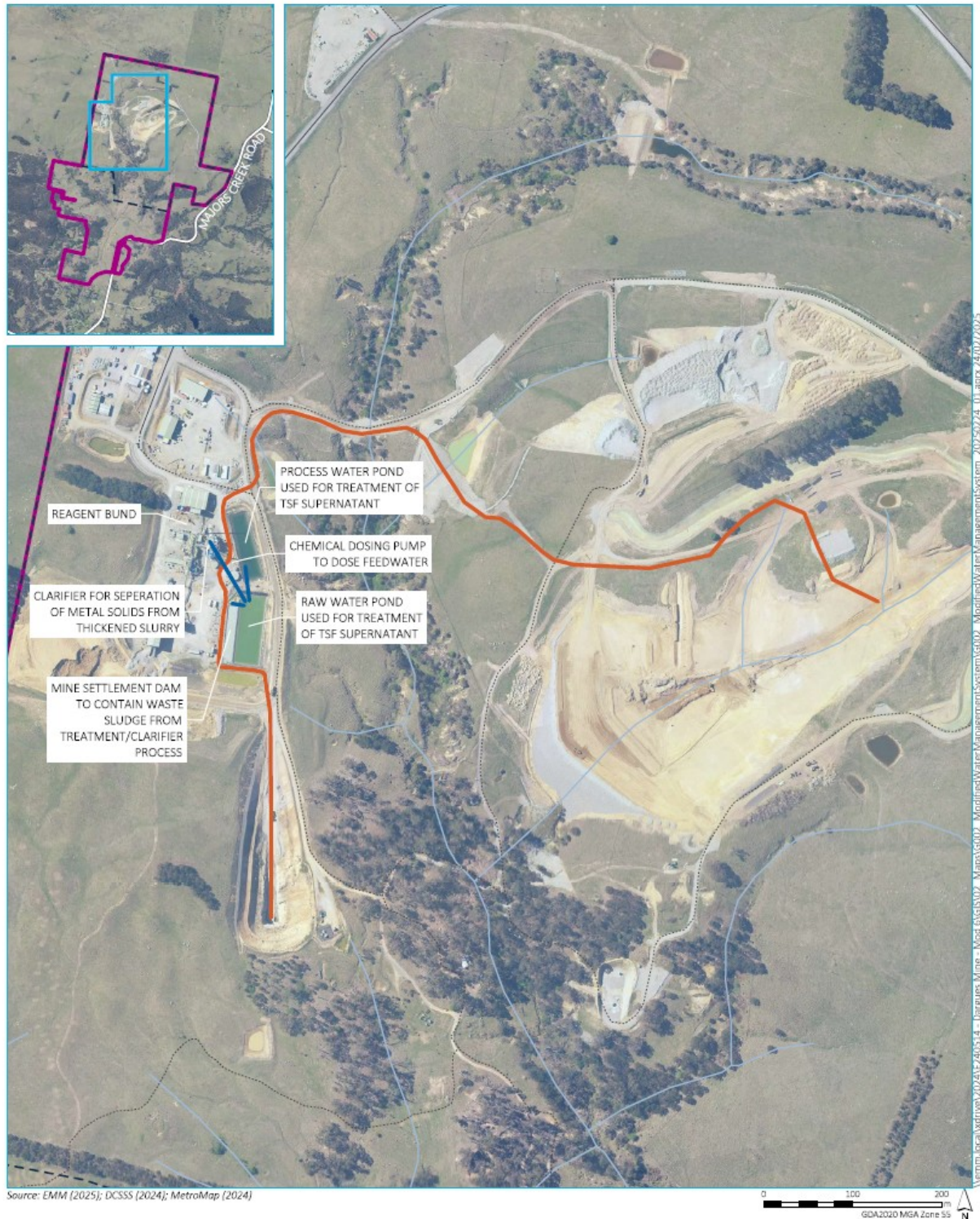
Figure 2.1, supplied by EMM, shows the area to be modified in the context of the overall site.

The TSF is currently holding approximately 100 ML of rainwater runoff, and with operations at the processing plant having ceased in August 2024, demand for water has reduced. A strategy is therefore required to remove the excess water currently stored in the TSF and commence closure and rehabilitation activities.

Aurelia is proposing to transfer water from the TSF into the disused underground mine. Given historic water quality analysis, it is unlikely that the TSF water will require treatment before transfer. However, should water quality monitoring identify that treatment is required, Aurelia has proposed to adopt a ferrous reduction process to remove toxic hexavalent chromium (Cr6) and associated heavy metals to low levels. The process involves liquid chemical addition, passive tank mixing and gravity separation, and can be undertaken at relatively high flow rates (i.e. 15-25 L/s).

Storage of chemicals will be required for the ferrous reduction process and the approximate location of the reagent storage bund is shown in Figure 2.1. The distance from this location to the site boundary is approximately 165 m.

BIM proposes to modify the consent under Section 4.56 of the *Environmental Planning & Assessment Act 1979* to amend the approved water management operations. Further details are provided in Chapter 3 of the Modification 6 report.



KEY

- | | |
|-----------------------------------|---------------------------|
| Site boundary | Existing environment |
| Mining lease boundary (ML1675) | Major road |
| Transfer route (TSF to UG portal) | Minor road |
| Treatment route | Vehicular track |
| | Watercourse/drainage line |

Modified water
management system

Dargues Gold Mine
Proposed Modification
Figure 3.1



3. PRELIMINARY RISK SCREENING

3.1. Overview

The objective of the preliminary risk screening was to determine whether the Proposal is considered as 'potentially hazardous' in the context of the Resilience and Hazards SEPP.

The Resilience and Hazards SEPP, Ref [1], defines potentially hazardous industry as follows:

'Potentially hazardous industry' means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

(a) to human health, life or property, or

(b) to the biophysical environment,

And includes a hazardous industry and a hazardous storage establishment.

Development proposals that are classified as 'potentially hazardous' industry must undergo a PHA as per the requirements set in DPHI's *Hazardous Industries Planning Advisory Paper* (HIPAP) No. 6 *Hazard Analysis*, Ref [3], to determine the risk to people, property and the environment. If the residual risk exceeds the acceptability criteria, Ref [4], the development is considered as a 'hazardous industry' and may not be permissible within NSW.

To determine whether a proposed development is 'potentially hazardous', the NSW DPHI *Applying SEPP 33* guideline, Ref [2], is used to undertake the risk screening process. The risk screening process considers the type and quantity of hazardous materials to be stored on site, distance of the storage area to the nearest site boundary, as well as the expected number of transport movements. Additionally, Appendix 2 and Appendix 3 of *Applying SEPP 33* include other risk factors to be considered to identify hazards outside the scope of the DG risk screening method and a list of industries that may be 'potentially hazardous', respectively.

'Hazardous materials' are defined within the *Applying SEPP 33* guideline as substances that fall within the classification of the Australia Code for the Transport of Dangerous Goods by Road & Rail (ADGC), i.e. have a DG classification. Details of the DG classification were obtained from the materials' Safety Data Sheet (SDS).

The *Applying SEPP 33* guideline is based on the 7th edition of ADGC, Ref [5], and refers to hazardous chemicals by their DG classification. In this document, substances will be referred to by their DG classification rather than their classification under the Globally Harmonised System (GHS), which is used in the ADGC Edition 7.6 or newer.

Risk screening is undertaken by comparing the storage quantity and the number of road movements of the hazardous materials with the screening threshold specified in the guideline. The screening threshold presents the quantities below which it can be assumed that significant offsite risk is unlikely.

3.2. Risk screening

3.2.1. Storage

A list of the expected types and quantities of chemicals associated with the Proposal that will be used and/or stored on site, including their DG classification (main class and where relevant, subsidiary class) and summary of risk screening is presented in Table 3.1. The SDS reviewed for the risk screening are presented in APPENDIX A.

The TSF includes chemicals that may be classified as DG. Raw and treated water samples from the TSF were analysed as part of Victory Engineering's design process. Results of the analysis (presented in APPENDIX B) indicate that the concentrations of all chemical constituents (which includes Cr6, arsenic, lead, etc.) were too low to be considered as DG and have, therefore, been excluded from risk screening.

The preliminary risk screening found that none of the reagents that will be used in the treatment process are classified as DG under the ADGC and do not have an applicable SEPP screening threshold. Therefore, the modification is not considered 'potentially hazardous', and a PHA is not required.

Table 3.1: Risk screening summary – Storage

Material	DG Class ^(a)	Packing Group	Quantity (tonnes) ^(b)	SEPP threshold	Threshold exceeded?
Ferrous chloride (45% w/w)	n/a	-	200	n/a	No
Magnesium hydroxide (slurry, 55% w/w)	n/a	-	140	n/a	No
Hydrogen peroxide (3% w/w)	n/a	-	16	n/a	No
Notes: (a) 'n/a' signifies that material is not classified as DG by the criteria of the ADGC, ed. 7.9, Ref [6]. (b) Estimated quantities from email, A. Chitteth (Aurelia Metals Ltd) to G. Tindall (InterChem Pty Ltd), 'Request for Quotation & SDS', 13 Jan 2025.					

3.2.2. Transport

The preliminary risk screening found that no materials classified as DG under the ADGC will be transported as part of the proposed modification. Therefore, the Proposal is not considered 'potentially hazardous' with respect to transportation and a route evaluation study is not required.

3.3. Other risk factors

Appendix 2 of *Applying SEPP 33* outlines other risk factors for consideration to identify hazards outside the scope of the DG risk screening method. An assessment of the other factors is presented in Table 3.2.

Table 3.2: Assessment against other risk factors

Risk factor	Commentary	Additional risk?
1. Incompatible materials (hazardous and non-hazardous materials)	Based on a review of the materials' SDS, all materials proposed are incompatible with oxidising agents, i.e. hydrogen peroxide. However, no reactions are expected as hydrogen peroxide is very dilute (3%). Any reactions that may occur between materials will not result in a sufficient release of toxic gas to lead to irritation. All material storage will be segregated as per Australian Standard requirements, and procedures will be in place for chemical addition and mixing activities.	No
2. Any wastes that could be hazardous	The Proposal will not generate any hazardous waste. See APPENDIX C for Victory Engineering's statement regarding hazardous wastes and intermediaries.	No
3. Existence of dusts in confined areas	The Proposal will not generate any combustible dust.	No
4. Types of activities the hazardous materials are associated with	The hazardous materials associated with the Proposal will be used in a ferrous-based water treatment process.	No
5. Storage or processing operations involving high (or extremely low) temperatures and/or pressures	The water treatment process involves the addition of liquid chemicals, passive mixing in plastic water tanks and gravity separation to remove hexavalent chromium and other heavy metals from dam water.	No
6. Incompatible, reactive or unstable materials and process conditions that could lead to uncontrolled reaction or decomposition	Based on a review of the materials' SDS, all materials proposed are incompatible with oxidising agents, i.e. hydrogen peroxide – see risk factor 1. None of the materials proposed are known to be reactive or unstable. There will be no chemicals with DG classification stored as part of the Proposal. All processing involving liquid chemicals will be conducted under gravity flow.	No
7. Details of known past incidents involving hazardous materials and processes in similar industries	Past incidents (i.e. explosions) have occurred involving wastewater treatment and mine waste handling. The causes of these incidents include ignition of methanol vapours and inadvertent mixing of incompatible materials. However, the Proposal will not be storing any of these materials on site. Therefore, similar incidents are not expected to occur.	No

3.4. Industries that may fall within SEPP 33

Appendix 3 of *Applying SEPP 33* provides a list of industries that may be potentially hazardous. It is noted that this list is illustrative rather than exhaustive.

The current edition of the guideline includes water/sewage treatment in the example list of potentially hazardous industries. The list cites chemical spills and mixing of incompatible materials as potential sources of hazard, leading to exposure to toxic liquids and gases. However, the Proposal will not involve any chemicals classified as DG, and mixing of incompatible materials will not form sufficient toxic liquids or gases to cause irritation. Therefore, the Proposal is not expected to introduce significant offsite risk.

4. CONCLUSION

The main findings of the preliminary risk screening are summarised as follows:

- The storage and transport of DG for the Proposal do not exceed the relevant risk screening thresholds.
- A review of 'other risk factors' listed in Appendix 2 of *Applying SEPP 33*, Ref [2] did not identify any 'additional risks'.

The risk screening concluded that the Proposal is not 'potentially hazardous' within the meaning of the Resilience and Hazards SEPP, Ref [1], and does not require a PHA.

APPENDIX A. SAFETY DATA SHEETS

All SDS reviewed for the risk screening are attached in the following pages. All SDS were provided by EMM.

Safety Data Sheet



Hazardous, NON-Dangerous Goods

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: **FERROUS CHLORIDE 45% (W/W)**

Recommended use: Water treatment

Supplier: Interchem Pty Ltd
ABN: 74 057 313 630
Street Address: 20 Harper Street
PO Box 101
Abbotsford VIC 3067 Australia
Telephone: +61 3 9270-9600
Facsimile: +61 3 9270-9666
Email: info@interchem.com.au

Emergency Telephone number: Australia: 1800 033 111, New Zealand: 0800 734 607

2. HAZARDS IDENTIFICATION

This material is hazardous according to the criteria of Safe Work Australia GHS 7.



Signal Word

Danger

Hazard Classifications

Corrosive to Metals - Category 1
Acute Toxicity - Oral - Category 4
Eye Damage - Category 1

Hazard Statements

H290 May be corrosive to metals.
H302 Harmful if swallowed.
H318 Causes serious eye damage.

Prevention Precautionary Statements

P102 Keep out of reach of children.
P103 Read carefully and follow all instructions.
P234 Keep only in original packaging.
P264 Wash hands, face and all exposed skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing including eye/face protection.

Response Precautionary Statements

P101 If medical advice is needed, have product container or label at hand.
P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER/doctor.
P330 Rinse mouth.
P390 Absorb spillage to prevent material damage.

Safety Data Sheet



Storage Precautionary Statement

P406 Store in corrosive resistant insert appropriate compatible material container with a resistant inner liner.

Disposal Precautionary Statement

P501 Dispose of contents/container in accordance with local, regional, national and international regulations.

Poison Schedule: Not Applicable

DANGEROUS GOOD CLASSIFICATION

Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO	PROPORTION
Iron chloride (FeCl ₂)	7758-94-3	45 % (w/w)
Ingredients determined to be non-hazardous		Balance
		100%

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone Australia 131 126, New Zealand 0800 764 766).

Inhalation: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact: If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

Eye contact: Immediately irrigate with copious quantities of water for 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Immediately call Poisons Centre or Doctor.

PPE for First Aiders: Wear safety shoes, overalls, gloves, safety glasses. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Notes to physician: Treat symptomatically. Can cause corneal burns.

5. FIRE FIGHTING MEASURES

Hazchem Code: Not applicable.

Suitable extinguishing media: If material is involved in a fire use water fog (or if unavailable fine water spray),

Product Name: FERROUS CHLORIDE 45% (W/W)

Reference No: INT0062201

Issued: 2025-01-15

Version: 1.0

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Safety Data Sheet



alcohol resistant foam, standard foam, dry agent (carbon dioxide, dry chemical powder).

Specific hazards: Non-combustible material.

Fire fighting further advice: Not applicable.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILLS

Wear protective equipment to prevent skin and eye contamination. Avoid inhalation of vapours or dust. Wipe up with absorbent (clean rag or paper towels). Collect and seal in properly labelled containers or drums for disposal.

LARGE SPILLS

Clear area of all unprotected personnel. Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and the inhalation of vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal. If contamination of crops, sewers or waterways has occurred advise local emergency services.

Dangerous Goods - Initial Emergency Response Guide No: Not applicable

7. HANDLING AND STORAGE

Handling: Avoid eye contact and repeated or prolonged skin contact. Avoid inhalation of vapour, mist or aerosols.

Storage: Store in a cool, dry, well-ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Store away from sources of heat and/or ignition. Store in corrosive resistant container with a resistant inner liner. Keep container standing upright. Keep containers closed when not in use - check regularly for leaks.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits: No value assigned for this specific material by Safe Work Australia.

Biological Limit Values: As per the "National Model Regulations for the Control of Workplace Hazardous Substances (Safe Work Australia)" the ingredients in this material do not have a Biological Limit Allocated.

Engineering Measures: Natural ventilation should be adequate under normal use conditions.

Personal Protection Equipment: SAFETY SHOES, OVERALLS, GLOVES, SAFETY GLASSES.

Personal protective equipment (PPE) must be suitable for the nature of the work and any hazard associated with the work as identified by the risk assessment conducted.

Wear safety shoes, overalls, gloves, safety glasses. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Wash hands prior to eating, drinking or smoking. Avoid contact with clothing. Avoid eye contact and repeated or prolonged skin contact. Avoid inhalation of vapour, mist or aerosols. Ensure that eyewash stations and safety showers are close to the workstation location.

Safety Data Sheet



9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquid
Colour:	N Av
Odour:	Characteristic
Solubility:	Soluble in water
Specific Gravity:	N Av
Relative Vapour Density (air=1):	>1
Vapour Pressure:	N Av
Flash Point (°C):	N App
Explosion/Flammability Limits:	N App
Autoignition Temperature (°C):	N App
Melting Point/Range (°C):	N Av
Boiling Point/Range (°C):	N Av
pH:	N Av
Viscosity:	N Av
Total VOC (g/Litre):	N Av

(Typical values only - consult specification sheet)

N Av = Not available, N App = Not applicable

10. STABILITY AND REACTIVITY

Chemical stability: This material is thermally stable when stored and used as directed.

Conditions to avoid: Elevated temperatures and sources of ignition.

Incompatible materials: Oxidising agents.

Hazardous decomposition products: Oxides of carbon and nitrogen, smoke and other toxic fumes.

Hazardous reactions: No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Acute Effects

Inhalation: Material may be an irritant to mucous membranes and respiratory tract.

Skin contact: Contact with skin may result in irritation.

Ingestion: Harmful if swallowed. Swallowing can result in nausea, vomiting and irritation of the gastrointestinal tract.

Eye contact: A severe eye irritant. Corrosive to eyes: contact can cause corneal burns. Contamination of eyes can result in permanent injury.

Acute toxicity

Inhalation: This material has been classified as not hazardous for acute inhalation exposure. Acute toxicity estimate (based on ingredients): $LC_{50} > 20.0$ mg/L for vapours or $LC_{50} > 5.0$ mg/L for dust and mist.

Skin contact: This material has been classified as not hazardous for acute dermal exposure. Acute toxicity estimate (based on ingredients): $LD_{50} > 2,000$ mg/Kg bw

Safety Data Sheet



Ingestion: This material has been classified as a Category 4 Hazard. Acute toxicity estimate (based on ingredients): $300 < LD_{50} \leq 2,000$ mg/Kg bw

Corrosion/Irritancy: Eye: this material has been classified as a Category 1 Hazard (irreversible effects to eyes). Skin: this material has been classified as not corrosive or irritating to skin.

Sensitisation: Inhalation: this material has been classified as not a respiratory sensitiser. Skin: this material has been classified as not a skin sensitiser.

Aspiration hazard: This material has been classified as not an aspiration hazard.

Specific target organ toxicity (single exposure): This material has been classified as not a specific hazard to target organs by a single exposure.

Chronic Toxicity

Mutagenicity: This material has been classified as not a mutagen.

Carcinogenicity: This material has been classified as not a carcinogen.

Reproductive toxicity (including via lactation): This material has been classified as not a reproductive toxicant.

Specific target organ toxicity (repeat exposure): This material has been classified as not a specific hazard to target organs by repeat exposure.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Acute aquatic hazard: This material has been classified as not hazardous for acute aquatic exposure. Acute toxicity estimate (based on ingredients): > 100 mg/L

Long-term aquatic hazard: This material has been classified as not hazardous for chronic aquatic exposure. Non-rapidly or rapidly degradable substance for which there are adequate chronic toxicity data available OR in the absence of chronic toxicity data, Acute toxicity estimate (based on ingredients): > 100 mg/L, where the substance is not rapidly degradable and/or $BCF < 500$ and/or $\log K_{ow} < 4$.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Persons conducting disposal, recycling or reclamation activities should ensure that appropriate personal protection equipment is used, see "Section 8. Exposure Controls and Personal Protection" of this SDS.

If possible material and its container should be recycled. If material or container cannot be recycled, dispose in accordance with local, regional, national and international Regulations.

14. TRANSPORT INFORMATION

Safety Data Sheet



ROAD AND RAIL TRANSPORT

Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

MARINE TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

AIR TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

15. REGULATORY INFORMATION

This material is not subject to the following international agreements:

Montreal Protocol (Ozone depleting substances)
The Stockholm Convention (Persistent Organic Pollutants)
The Rotterdam Convention (Prior Informed Consent)
Basel Convention (Hazardous Waste)
International Convention for the Prevention of Pollution from Ships (MARPOL)

This material/constituent(s) is covered by the following requirements:

The Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) established under the Therapeutic Goods Act (Commonwealth): Not Applicable.

AICIS Status: All components of this product are listed on or exempt from the Australian Inventory of Industrial Chemicals (AIIC).

16. OTHER INFORMATION

Reason for issue: First Issue

This Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd on behalf of its client.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This information was prepared in good faith from the best information available at the time of issue. It is based on the present level of research and to this extent we believe it is accurate. However, no guarantee of accuracy is made or implied and since conditions of use are beyond our control, all information relevant to usage is offered without warranty. The manufacturer will not be held responsible for any unauthorised use of this information or for any modified or altered versions.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.

Safety Data Sheet



NON-Hazardous, NON-Dangerous Goods

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: **MAGNESIUM HYDROXIDE 55% (W/W)**

Recommended use: Water treatment

Supplier: Interchem Pty Ltd
ABN: 74 057 313 630
Street Address: 20 Harper Street
PO Box 101
Abbotsford VIC 3067 Australia
Telephone: +61 3 9270-9600
Facsimile: +61 3 9270-9666
Email: info@interchem.com.au

Emergency Telephone number: Australia: 1800 033 111, New Zealand: 0800 734 607

2. HAZARDS IDENTIFICATION

Based on available information, this material is not classified as hazardous according to criteria of Safe Work Australia GHS 7.

Poison Schedule: Not Applicable

DANGEROUS GOOD CLASSIFICATION

Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO	PROPORTION
Magnesium hydroxide (Mg(OH) ₂)	1309-42-8	55 % (w/w)
Ingredients determined to be non-hazardous		Balance
		100%

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone Australia 131 126, New Zealand 0800 764 766).

Inhalation: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact: If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

Eye contact: If in eyes wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink.

Product Name: **MAGNESIUM HYDROXIDE 55% (W/W)**

Reference No: **INT0062401**

Issued: **2025-01-16**

Version: **1.0**

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Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Seek medical advice.

PPE for First Aiders: Wear safety shoes, overalls, gloves, safety glasses. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Notes to physician: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazchem Code: Not applicable.

Suitable extinguishing media: If material is involved in a fire use water fog (or if unavailable fine water spray), alcohol resistant foam, standard foam, dry agent (carbon dioxide, dry chemical powder).

Specific hazards: Non-combustible material.

Fire fighting further advice: Not applicable.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILLS

Wear protective equipment to prevent skin and eye contamination. Avoid inhalation of vapours or dust. Wipe up with absorbent (clean rag or paper towels). Collect and seal in properly labelled containers or drums for disposal.

LARGE SPILLS

Clear area of all unprotected personnel. Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and the inhalation of vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal. If contamination of crops, sewers or waterways has occurred advise local emergency services.

Dangerous Goods - Initial Emergency Response Guide No: Not applicable

7. HANDLING AND STORAGE

Handling: Avoid eye contact and repeated or prolonged skin contact. Avoid inhalation of vapour, mist or aerosols.

Storage: Store in a cool, dry, well-ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Store away from sources of heat and/or ignition. Keep container standing upright. Keep containers closed when not in use - check regularly for leaks.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits: No value assigned for this specific material by Safe Work Australia.

Biological Limit Values: As per the "National Model Regulations for the Control of Workplace Hazardous Substances (Safe Work Australia)" the ingredients in this material do not have a Biological Limit Allocated.

Engineering Measures: Natural ventilation should be adequate under normal use conditions.

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Personal Protection Equipment: SAFETY SHOES, OVERALLS, GLOVES, SAFETY GLASSES.

Personal protective equipment (PPE) must be suitable for the nature of the work and any hazard associated with the work as identified by the risk assessment conducted.

Wear safety shoes, overalls, gloves, safety glasses. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Wash hands prior to eating, drinking or smoking. Avoid contact with clothing. Avoid eye contact and repeated or prolonged skin contact. Avoid inhalation of vapour, mist or aerosols. Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquid
Colour:	Off-white/light pink
Odour:	Odourless
Solubility:	Dispersible in water
Specific Gravity:	1.45 - 1.55
Relative Vapour Density (air=1):	>1
Vapour Pressure:	N Av
Flash Point (°C):	N App
Explosion/Flammability Limits:	N App
Autoignition Temperature (°C):	N App
Melting Point/Range (°C):	N Av
Boiling Point/Range (°C):	N Av
Decomposition Point (°C):	350
pH:	9 - 10
Viscosity:	N Av
Total VOC (g/Litre):	N Av

(Typical values only - consult specification sheet)
N Av = Not available, N App = Not applicable

10. STABILITY AND REACTIVITY

Chemical stability: This material is thermally stable when stored and used as directed.

Conditions to avoid: Elevated temperatures and sources of ignition.

Incompatible materials: Oxidising agents.

Hazardous decomposition products: Oxides of carbon and nitrogen, smoke and other toxic fumes.

Hazardous reactions: No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Acute Effects

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Inhalation: Material may be an irritant to mucous membranes and respiratory tract.

Skin contact: Contact with skin may result in irritation.

Ingestion: Swallowing can result in nausea, vomiting and irritation of the gastrointestinal tract.

Eye contact: May be an eye irritant.

Acute toxicity

Inhalation: This material has been classified as not hazardous for acute inhalation exposure. Acute toxicity estimate (based on ingredients): $LC_{50} > 20.0$ mg/L for vapours or $LC_{50} > 5.0$ mg/L for dust and mist.

Skin contact: This material has been classified as not hazardous for acute dermal exposure. Acute toxicity estimate (based on ingredients): $LD_{50} > 2,000$ mg/Kg bw

Ingestion: This material has been classified as not hazardous for acute ingestion exposure. Acute toxicity estimate (based on ingredients): $LD_{50} > 2,000$ mg/Kg bw

Corrosion/Irritancy: Eye: this material has been classified as not corrosive or irritating to eyes. Skin: this material has been classified as not corrosive or irritating to skin.

Sensitisation: Inhalation: this material has been classified as not a respiratory sensitiser. Skin: this material has been classified as not a skin sensitiser.

Aspiration hazard: This material has been classified as not an aspiration hazard.

Specific target organ toxicity (single exposure): This material has been classified as not a specific hazard to target organs by a single exposure.

Chronic Toxicity

Mutagenicity: This material has been classified as not a mutagen.

Carcinogenicity: This material has been classified as not a carcinogen.

Reproductive toxicity (including via lactation): This material has been classified as not a reproductive toxicant.

Specific target organ toxicity (repeat exposure): This material has been classified as not a specific hazard to target organs by repeat exposure.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Acute aquatic hazard: This material has been classified as not hazardous for acute aquatic exposure. Acute toxicity estimate (based on ingredients): > 100 mg/L

Long-term aquatic hazard: This material has been classified as not hazardous for chronic aquatic exposure. Non-rapidly or rapidly degradable substance for which there are adequate chronic toxicity data available OR in the absence of chronic toxicity data, Acute toxicity estimate (based on ingredients): > 100 mg/L, where the substance is not rapidly degradable and/or $BCF < 500$ and/or $\log K_{ow} < 4$.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

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Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Persons conducting disposal, recycling or reclamation activities should ensure that appropriate personal protection equipment is used, see "Section 8. Exposure Controls and Personal Protection" of this SDS.

If possible material and its container should be recycled. If material or container cannot be recycled, dispose in accordance with local, regional, national and international Regulations.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT

Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

MARINE TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

AIR TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

15. REGULATORY INFORMATION

This material is not subject to the following international agreements:

Montreal Protocol (Ozone depleting substances)
The Stockholm Convention (Persistent Organic Pollutants)
The Rotterdam Convention (Prior Informed Consent)
Basel Convention (Hazardous Waste)
International Convention for the Prevention of Pollution from Ships (MARPOL)

This material/constituent(s) is covered by the following requirements:

The Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) established under the Therapeutic Goods Act (Commonwealth): Not Applicable.

AICIS Status: All components of this product are listed on or exempt from the Australian Inventory of Industrial Chemicals (AIIC).

16. OTHER INFORMATION

Reason for issue: First Issue

This Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd on behalf of its client.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This information was prepared in good faith from the best information available at the time of issue. It is based on the present level of research and to this extent we believe it is accurate. However, no guarantee of accuracy is made or implied and since conditions of use are beyond our control, all information relevant to usage is offered without warranty. The manufacturer will not be held responsible for any unauthorised use of this information or for any modified or altered versions.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user

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should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.

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Hazardous, NON-Dangerous Goods

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: **HYDROGEN PEROXIDE 3% (W/W)**

Recommended use: Water treatment

Supplier: Interchem Pty Ltd
ABN: 74 057 313 630
Street Address: 20 Harper Street
PO Box 101
Abbotsford VIC 3067 Australia
Telephone: +61 3 9270-9600
Facsimile: +61 3 9270-9666
Email: info@interchem.com.au

Emergency Telephone number: Australia: 1800 033 111, New Zealand: 0800 734 607

2. HAZARDS IDENTIFICATION

This material is hazardous according to the criteria of Safe Work Australia GHS 7.



Signal Word
Warning

Hazard Classification
Skin Irritation - Category 2

Hazard Statement
H315 Causes skin irritation.

Prevention Precautionary Statements
P102 Keep out of reach of children.
P103 Read carefully and follow all instructions.
P264 Wash hands, face and all exposed skin thoroughly after handling.
P280 Wear protective gloves/protective clothing including eye/face protection.

Response Precautionary Statements
P101 If medical advice is needed, have product container or label at hand.
P302+P352 IF ON SKIN: Wash with plenty of water and soap.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse

Storage Precautionary Statement
Not allocated

Disposal Precautionary Statement
Not allocated

Poison Schedule: Not Applicable

DANGEROUS GOOD CLASSIFICATION

Product Name: HYDROGEN PEROXIDE 3% (W/W)

Reference No: INT0062301

Issued: 2025-01-15

Version: 1.0

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Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO	PROPORTION
Hydrogen peroxide (H ₂ O ₂)	7722-84-1	3 % (w/w)
Ingredients determined to be non-hazardous		Balance
		100%

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone Australia 131 126, New Zealand 0800 764 766).

Inhalation: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin Contact: If skin or hair contact occurs, immediately remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre or a Doctor; or for 15 minutes and transport to Doctor or Hospital.

Eye contact: If in eyes wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Seek medical advice.

PPE for First Aiders: Wear safety shoes, overalls, gloves, safety glasses. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Notes to physician: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazchem Code: Not applicable.

Suitable extinguishing media: If material is involved in a fire use water fog (or if unavailable fine water spray), alcohol resistant foam, standard foam, dry agent (carbon dioxide, dry chemical powder).

Specific hazards: Non-combustible material.

Fire fighting further advice: Not combustible, however following evaporation of aqueous component residual material can burn if ignited.

6. ACCIDENTAL RELEASE MEASURES

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SMALL SPILLS

Wear protective equipment to prevent skin and eye contamination. Avoid inhalation of vapours or dust. Wipe up with absorbent (clean rag or paper towels). Collect and seal in properly labelled containers or drums for disposal.

LARGE SPILLS

Clear area of all unprotected personnel. Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and the inhalation of vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal. If contamination of crops, sewers or waterways has occurred advise local emergency services.

Dangerous Goods - Initial Emergency Response Guide No: Not applicable

7. HANDLING AND STORAGE

Handling: Avoid eye contact and skin contact. Avoid inhalation of vapour, mist or aerosols.

Storage: Store in a cool, dry, well-ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Store away from sources of heat and/or ignition. Keep container standing upright. Keep containers closed when not in use - check regularly for leaks.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits:

	TWA		STEL		NOTICES
	ppm	mg/m3	ppm	mg/m3	
Hydrogen peroxide	1.00	1.40			-

As published by Safe Work Australia.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.

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.

If the directions for use on the product label are followed, exposure of individuals using the product should not exceed the above standard. The standard was created for workers who are routinely, potentially exposed during product manufacture.

Biological Limit Values: As per the "National Model Regulations for the Control of Workplace Hazardous Substances (Safe Work Australia)" the ingredients in this material do not have a Biological Limit Allocated.

Engineering Measures: Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Use only in well ventilated areas. Use with local exhaust ventilation or while wearing appropriate respirator. Vapour heavier than air - prevent concentration in hollows or sumps. Do NOT enter confined spaces where vapour may have collected.

Personal Protection Equipment: SAFETY SHOES, OVERALLS, GLOVES, SAFETY GLASSES.

Personal protective equipment (PPE) must be suitable for the nature of the work and any hazard associated with

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the work as identified by the risk assessment conducted.

Wear safety shoes, overalls, gloves, safety glasses. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Wash hands prior to eating, drinking or smoking. Avoid contact with clothing. Avoid eye contact and skin contact. Avoid inhalation of vapour, mist or aerosols. Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquid
Colour:	N Av
Odour:	Characteristic
Solubility:	Soluble in water
Specific Gravity:	N Av
Relative Vapour Density (air=1):	>1
Vapour Pressure:	N Av
Flash Point (°C):	N App
Explosion/Flammability Limits:	N App
Autoignition Temperature (°C):	N Av
Melting Point/Range (°C):	N Av
Boiling Point/Range (°C):	N Av
pH:	N Av
Viscosity:	N Av
Total VOC (g/Litre):	N Av

(Typical values only - consult specification sheet)
N Av = Not available, N App = Not applicable

10. STABILITY AND REACTIVITY

Chemical stability: This material is thermally stable when stored and used as directed.

Conditions to avoid: Elevated temperatures and sources of ignition.

Incompatible materials: Oxidising agents.

Hazardous decomposition products: Oxides of carbon and nitrogen, smoke and other toxic fumes.

Hazardous reactions: No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Acute Effects

Inhalation: Material may be an irritant to mucous membranes and respiratory tract.

Skin contact: Contact with skin will result in irritation.

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Ingestion: Swallowing can result in nausea, vomiting and irritation of the gastrointestinal tract.

Eye contact: May be an eye irritant.

Acute toxicity

Inhalation: This material has been classified as not hazardous for acute inhalation exposure. Acute toxicity estimate (based on ingredients): $LC_{50} > 20.0$ mg/L for vapours or $LC_{50} > 5.0$ mg/L for dust and mist.

Skin contact: This material has been classified as not hazardous for acute dermal exposure. Acute toxicity estimate (based on ingredients): $LD_{50} > 2,000$ mg/Kg bw

Ingestion: This material has been classified as not hazardous for acute ingestion exposure. Acute toxicity estimate (based on ingredients): $LD_{50} > 2,000$ mg/Kg bw

Corrosion/Irritancy: Eye: this material has been classified as not corrosive or irritating to eyes. Skin: this material has been classified as a Category 2 Hazard (reversible effects to skin).

Sensitisation: Inhalation: this material has been classified as not a respiratory sensitiser. Skin: this material has been classified as not a skin sensitiser.

Aspiration hazard: This material has been classified as not an aspiration hazard.

Specific target organ toxicity (single exposure): This material has been classified as not a specific hazard to target organs by a single exposure.

Chronic Toxicity

Mutagenicity: This material has been classified as not a mutagen.

Carcinogenicity: This material has been classified as not a carcinogen.

Reproductive toxicity (including via lactation): This material has been classified as not a reproductive toxicant.

Specific target organ toxicity (repeat exposure): This material has been classified as not a specific hazard to target organs by repeat exposure.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Acute aquatic hazard: This material has been classified as not hazardous for acute aquatic exposure. Acute toxicity estimate (based on ingredients): > 100 mg/L

Long-term aquatic hazard: This material has been classified as not hazardous for chronic aquatic exposure. Non-rapidly or rapidly degradable substance for which there are adequate chronic toxicity data available OR in the absence of chronic toxicity data, Acute toxicity estimate (based on ingredients): > 100 mg/L, where the substance is not rapidly degradable and/or $BCF < 500$ and/or $\log K_{ow} < 4$.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

Mobility: No information available.

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13. DISPOSAL CONSIDERATIONS

Persons conducting disposal, recycling or reclamation activities should ensure that appropriate personal protection equipment is used, see "Section 8. Exposure Controls and Personal Protection" of this SDS.

If possible material and its container should be recycled. If material or container cannot be recycled, dispose in accordance with local, regional, national and international Regulations.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT

Not classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

MARINE TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

AIR TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

15. REGULATORY INFORMATION

This material is not subject to the following international agreements:

Montreal Protocol (Ozone depleting substances)
The Stockholm Convention (Persistent Organic Pollutants)
The Rotterdam Convention (Prior Informed Consent)
Basel Convention (Hazardous Waste)
International Convention for the Prevention of Pollution from Ships (MARPOL)

This material/constituent(s) is covered by the following requirements:

The Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) established under the Therapeutic Goods Act (Commonwealth): Not Applicable.

AICIS Status: All components of this product are listed on or exempt from the Australian Inventory of Industrial Chemicals (AIIC).

16. OTHER INFORMATION

Reason for issue: First Issue

This Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd on behalf of its client.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This information was prepared in good faith from the best information available at the time of issue. It is based on the present level of research and to this extent we believe it is accurate. However, no guarantee of accuracy is made or implied and since conditions of use are beyond our control, all information relevant to usage is offered without warranty. The manufacturer will not be held responsible for any unauthorised use of this information or for any modified or altered versions.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to

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our customers and is also available upon request.

APPENDIX B. TAILINGS STORAGE FACILITY WATER TESTWORK DATA

The following test data has been provided by Victory Engineering (email from S. Reeve [Victory Engineering] to M. Ryan [EMM] and A. Saunders [Aurelia Metals], 19-Aug-2024).

Summary of Hexavalent Chromium Removal Testwork Data

Preface:

- Victory Engineering received 4 x 20 L containers of Dargues Reef mine tailings dam supernatant water from Aurelia Metals.
- Settled sludge was observed on the bottom of the received containers.
- Sludge was mixed (shaken by hand) into the bulk of the container water prior to sub-sampling for testwork and analyses.
- Samples were analysed by Envirolab in Sydney.
- The raw waters were tested as received.

Received raw/untreated water sample data:

Table B.1: Raw/untreated water analysis

Analyte	Units	Concentration/Value
Cadmium – Dissolved	µg/L (ppb)	< 0.1
Cobalt – Dissolved	µg/L (ppb)	< 1
Aluminium – Dissolved	µg/L (ppb)	100
Iron – Dissolved	µg/L (ppb)	< 10
Copper – Dissolved	µg/L (ppb)	5
Nickel – Dissolved	µg/L (ppb)	< 1
Lead – Dissolved	µg/L (ppb)	< 1
Chromium – Dissolved	µg/L (ppb)	< 1
Zinc – Dissolved	µg/L (ppb)	< 1
Arsenic – Dissolved	µg/L (ppb)	1
Manganese – Dissolved	µg/L (ppb)	< 5
Cadmium – Total	µg/L (ppb)	< 0.1
Cobalt – Total	µg/L (ppb)	< 1
Aluminium – Total	µg/L (ppb)	460
Iron – Total	µg/L (ppb)	700
Copper – Total	µg/L (ppb)	9
Nickel – Total	µg/L (ppb)	< 1
Lead – Total	µg/L (ppb)	< 1
Chromium – Total	µg/L (ppb)	1
Zinc – Total	µg/L (ppb)	3

Analyte	Units	Concentration/Value
Arsenic – Total	µg/L (ppb)	1
Manganese – Total	µg/L (ppb)	32
pH	pH units	8.6
Electrical Conductivity	µS/cm	1,600
Hexavalent Chromium, Cr6+ (dissolved)	mg/L (ppm)	< 0.005
Hex Chromium, Cr6+ (total/unfiltered)	mg/L (ppm)	< 0.005
Trivalent Chromium, Cr3+	mg/L (ppm)	< 0.005
Trivalent Chromium, Cr3+ (total/unfiltered)	mg/L (ppm)	< 0.005

Treated water results:

Testwork basis (Victory reference: “S7” testwork):

1. Addition of ~400 mg/L ferrous sulphate heptahydrate (solid); mix;
2. Aeration and pH adjustment to pH ~8.0; mix;
3. Addition of strong oxidant (potassium permanganate): ~3 mg/L; mix;
4. Addition of anionic polymer flocculant; mix;
5. Gravity sedimentation.

Analyte	Units	Concentration/Value
Cadmium – Dissolved	µg/L (ppb)	<0.1
Cobalt – Dissolved	µg/L (ppb)	<1
Aluminium – Dissolved	µg/L (ppb)	<10
Iron – Dissolved	µg/L (ppb)	<10
Copper – Dissolved	µg/L (ppb)	2
Nickel – Dissolved	µg/L (ppb)	<1
Lead – Dissolved	µg/L (ppb)	<1
Chromium – Dissolved	µg/L (ppb)	<1
Zinc – Dissolved	µg/L (ppb)	<1
Arsenic – Dissolved	µg/L (ppb)	<1
Manganese – Dissolved	µg/L (ppb)	1,300 ^(a)
pH	pH units	8.0
Electrical Conductivity	µS/cm	2,100
Hexavalent Chromium, Cr6+ (dissolved)	mg/L (ppm)	<0.005
Hexavalent Chromium, Cr6+ (total/unfiltered)	mg/L (ppm)	<0.005
Trivalent Chromium, Cr3+	mg/L (ppm)	<0.005
Trivalent Chromium, Cr3+ (total/unfiltered)	mg/L (ppm)	<0.005
Notes:		
(a) Manganese elevated due to residuals from added potassium permanganate; proposed treatment system to use of Hydrogen Peroxide.		

APPENDIX C. FERROUS REDUCTION PROCESS

The following statement regarding potentially hazardous wastes or intermediaries from the ferrous reduction process has been provided by Victory Engineering (email from S. Reeve [Victory Engineering] to M. Ryan [EMM], 12-Feb-2025).

Dargues Reef Mine: Ferrous Reduction Process for Hexavalent Chromium Removal – Statements on Hazardous Wastes or Intermediaries

The proposed treatment process for removal of Hexavalent Chromium from the mine tailings supernatant is chemically intensive, to suit the continuous, low-maintenance, low-monitoring and temporary requirements of the project. As a result, the chemicals themselves pose risks and must be stored and banded appropriately, so as to minimise the likelihood of unnecessary human contact, and the potential for discharge to the surrounding environment. It should be noted that the treatment process also needs to reduce other heavy metals to be below environmental thresholds so, whilst the focus on the treatment process is Hexavalent Chromium, the process also needs to simultaneously ensure that other heavy metals are also dealt with appropriately.

However, a consideration of final treatment wastes and potential intermediaries is also required, including the potential effect of chemical overdose; the fate of unused chemical also needs to be considered. These considerations are discussed below.

Treatment Wastes

There are two treatment process wastes produced by the proposed process: treated water (which could also be considered the 'product'), and generated sludge.

Generated sludge: the generated solids will contain low concentrations of heavy metals, commensurate with the concentration of heavy metals in the raw water; the pH of the sludge will likely be 8-9, which is not considered generally problematic from an environmental point of view, will generally be geo-chemically stable with very-low Free and Total heavy metal content. With the conversion of Hexavalent Chromium into Trivalent Chromium earlier in the treatment process, and pH adjustment to 8-9, the sludge will contain low concentrations of Chromium Hydroxide and other heavy metal Hydroxides. These metal Hydroxides will co-exist with a proportionally very-high concentration of Iron Hydroxide, which serves as *[an]* enmeshment and absorption agent that is itself intrinsically stable. Hence, the probability of heavy metal leaching is low/very-low. Overall, the residual environmental risk posed by the sludge is low/very-low, assuming that the long-term pH of sludge storage is moderately alkaline (in the order of ~7.5-9.5).

Treated water: the primary risks relating to the treated water relate to the possibility of highly soluble and stubborn metal intermediaries, and treatment chemical residuals. The Ferrous Reduction process may convert some heavy metals (other than Hexavalent Chromium) into more soluble forms (intermediaries), such as Copper(II) into Copper(I). However, the proposed

process will also convert reduced metals to less soluble forms by oxidation (aeration and Ferric iron interactions, with a backup strong oxidant (Hydrogen Peroxide) if required), without converting the Trivalent Chromium (less soluble) back into Hexavalent Chromium (more soluble). Hence, the likelihood of persistent heavy metal intermediates as a result of the reduction process is not probable; additionally, the starting concentrations of the heavy metals is very low, further reducing the overall risk. The risk of chemical residuals relates primarily to the Hydrogen Peroxide, and the polymer/s used for solid-liquid separation. The peroxide should be dosed at a relatively low concentration (if at all), to polish any heavy metals from the water; the peroxide will breakdown in the water due to the pH of the water (8-9), exposure to sunlight, and holding time. Hence, the risk of peroxide residuals to the environment and people is low if the system is controlled and monitored appropriately, and degradation opportunity is provided. The solid-liquid separation polymers (coagulant and/or flocculant) have a very-high affinity for solids; hence, the risk of polymer residuals is greatly mitigated if the dose rate [...] is controlled to what is necessary, and a good deal of mixing is provided between the polymer/s and the suspended solids to ensure complete absorption of the polymers onto the suspended solids. Though the previous measures are generally sufficient, the overall risk relating to polymer residuals can be further mitigated by avoiding discharge of the treated water to creeks and rivers – however, disposal by irrigation or by transfer to a mine shaft will provide further solid surfaces to consume any residual polymers, as well as additional opportunity for microbial degradation; additionally, with regard to the polymer/s, any treated water stored in the tailings dam (or another process water dam) as supernatant does not pose an environmental risk.

Unused chemicals: it is likely that at the end of the treatment campaign that there will be some unused chemical. It is likely that the Ferrous Chloride, Magnesium Hydroxide and Hydrogen Peroxide can be co-disposed onsite, as their generated by-products will be largely non-hazardous. However, the unused polymer/s will either be to be transferred to another solid-liquid separation process at another site or industrially disposed.

APPENDIX D. REFERENCES

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