SITE BASED MANAGEMENT PLAN

TERREQUIP MILES BENTONITE MINE

prepared by Ausrocks Resource Consultants
for Department of Environment and Science

AUQ00238F

TERREQUIP MILES PTY LTD

MILES BENTONITE MINE – SITE BASED MANAGEMENT PLAN

7 FEBRUARY 2024

AUSROCKS RESOURCE CONSULTANTS

Unit 3, 50 Northlink Place
Virginia, QLD, 4014

Email: info@ausrocks.com.au
Phone: (07) 3161 4108
www.ausrocks.com.au
ABN: 64 056 939 014

Document Control

General Information

Item	Detail
Project Name	Miles Bentonite Mine
Project Number	AUQ00238F
Document Title	Site Based Management Plan
File Name	EPML00382513-SBMP-Miles
File Location	\00238_Terrequip Pty Ltd\F - Miles\Mine Planning\SBMP\SBMP 2023
Revision Status	1.1

Revision History

Revision	Issue	Prepared by	Reviewed by	Date
1.0	Draft	RM	CM	25/01/2024
1.0	Final	RM	CM	7/02/2024
1.1	Final (amended error in text)	RM	CM	8/02/2024

Issue Register

Date	Distribution List
7/02/2024	Terrequip Miles Pty Ltd; Department of Environment and Science
8/02/2024	Terrequip Miles Pty Ltd; Department of Environment and Science

Limitations

This document has been prepared on behalf of and for the exclusive use of the client. This document has been prepared with all due care and attention according to accepted practices and techniques. This document is intended only for the client and may not be relied upon by any other person.

In preparing this document, Ausrocks Pty Ltd has relied upon, and presumed accurate, certain information (or absence thereof) relative to data provided by government officials and authorities, the client, and other sources as identified in the document. Except as otherwise stated, Ausrocks Pty Ltd has not attempted to verify the accuracy or completeness of any such information.

Ausrocks Pty Ltd accepts no responsibility for any misuse or application of the material set out in this document for any purpose other than the purpose for which it is provided. Ausrocks Pty Ltd accepts no responsibility for any damages of whatsoever nature, however caused arising from misapplication or misinterpretation by third parties of the contents of this document.

This document has been reviewed and signed off by the undersigned:

Carl Morandy (RPEQ22981)

Managing Director, Ausrocks Pty Ltd

Table of Contents

List of figures

List of tables

List of appendices

Terms & Abbreviations

ARC	Ausrocks Resource Consultants (Ausrocks Pty Ltd)
BMP	Bushfire Management Plan
DES	Department of Environment and Science
EA	Environmental Authority
EP Act	*Environmental Protection Act 1994*
FLURP	Final Land Use and Rehabilitation Plan
LGA	Local Government Area
ML	Mining Lease
PMLU	Post-mining land use
SBMP	Site Based Management Plan
SDS	Safety Data Sheets
Sibelco	Sibelco Australia Ltd
Site	Miles Bentonite Mine
SSE	Site Senior Executive
SWMMP	Site Water Management and Monitoring Plan
Terrequip	Terrequip Miles Pty Ltd

1 OVERVIEW

1.1 Purpose

This Site Based Management Plan (SBMP) provides an operational environmental framework for bentonite clay mining operations by Terrequip Miles Pty Ltd (Terrequip) at the Miles Bentonite Mine. The site operates within mining leases (ML) ML5898, ML5902, ML5905, ML5906, ML5907, ML5909, ML50058 within the Western Downs Regional Council, and ML5900 and ML5901 in the Maranoa Regional Council Local Government Areas (LGA).

From herein the mining leases shall be referred to as:

- Ausben Leases – ML5907, ML5909, ML50058
- Gurulmundi Leases – ML5898, ML5902, ML5905, ML5906
- Woleebee Leases – ML5900, ML5901

This SBMP aims to provide guidelines to the management and mitigation of potentially adverse impacts to local environmental values as a result of site operations. Best practice environmental management will be implemented wherever practicable and in accordance with the requirements of the *Environmental Protection Act 1994* (EP Act) and other relevant Federal, State and Local government legislation.

The mining operations at the site are considered to present a low risk of harm to local environmental values with the implementation of this SBMP.

1.2 Description of Operations

An overview of site operations is provided in **Table 1**.

Table 1: Site operations

Aspect of Operations	Description
Project Proponent	• Terrequip Miles Pty Ltd
Project Description	• Lot 72 AU177, Lot 59 AU55 and Lot 38 AU184
Local Government Area	• Western Downs Regional Council (Taroom Shire)
Registered Suitable Operator Reference	• RSO004475 (Terrequip Miles Pty Ltd)
Nature of Activity	• Bentonite clay mining
Environmentally Relevant Activity (ERA)	• Mining – ML Claypit, dimension stone or gemstones – 20(a)
Commencement and Completed Date	• Start year: • End year: 2043 (per mining lease expiry dates, subject to potential renewal period)
Disturbance Footprint	• Maximum disturbance footprint is limited by Environmental Authority EPML00382513
Plant and Equipment	• The following infrastructure shall be utilised under normal operating conditions: - Site Office, Admin Buildings, and Break Facilities; - Weighbridge;

Aspect of Operations	Description
	- Wash Plant; - Crusher; - Maintenance and Workshop Sheds; and - Laboratory. • The following plant and equipment shall be utilised under normal operating conditions: - Light Vehicles (utility trucks); - Forklifts; - Tractors; - Rotary Hoe; - Tipper Truck; - Skid-Steer Loader; - Wheel Loader; - Rifle Splitter; - Water Truck; and - Minibus. • Electricity is supplied via mains power from Ergon Energy.
Method of Operation	• Open cut mining methods; and • Materials extracted by excavator or loader with the use of tractors for spreading material onto drying pads.
Hours of Operation	• The EA allows 24/7 operations; • Normal operating hours are up to six (6) days per week between Monday to Saturday; • No operations are scheduled on Sundays or Public Holidays (except in case of emergency); and . • Mechanical processing is expected to occur on average 15-hours per day, 5-days a week, 12-months a year. • Maintenance shall occasionally take place outside of normal operating hours
Wastes	• General waste (e.g. from office buildings, toilets, workshops, etc.) shall be disposed of in appropriate waste receptacles until it is collected by a suitably licenced waste operator; • Hazardous waste (e.g. oil and fuel) shall be stored in appropriate containers housed in areas away from sources of ignition until it is collected by suitably licenced waste operators; and • Waste/overburden material shall be stockpiled adjacent to operational pits until it is required for use as backfill during rehabilitation.
Heavy Vehicle Traffic and Types	• Heavy vehicle traffic generated by operations shall include: - Loaders; - Tippers; and - Water Truck.
Light Vehicle Traffic	• Light vehicle traffic will be highest during peak time prior to, and at the end of site personnel shift times (i.e. morning and afternoon); and • There will be no significant light vehicle traffic generated by operations.

1.3 Bentonite Mining

The Miles bentonites are primarily montmorillonite clay with a high sodium to calcium (Na:Ca) ratio). The bentonites sub-crop along a north-westerly trend and dip shallowly to the southwest. Primary bentonite quality is associated with variations in ash composition but also varies due to complex interactions of initial composition, weathering and terrain. High quality bentonite is currently mined from ML5909 with future mining to occur from ML5907 and ML50058 (Ausben leases), and from ML5900 and ML5901 (Woleebee leases). Mined bentonite is transported to the processing plant on ML5902.

Mining at Miles is currently performed on a campaign-basis using contractor plant equipment and labour. Mining is conventional free-dig open-cast typically utilising dozers and scrapers to remove topsoil and overburden and scrapers to remove topsoil and overburden and scrapers to mine and stockpile bentonite crudes.

Natural vegetation on ML5909 and portions of natural vegetation on ML5907 and ML50058 have mostly been cleared for grazing purposes. Consequently, there is little to no natural vegetation to remove from the areas for future mining campaigns. Areas of MSES[1] wildlife habitat (special least concern animal) on ML5907 and ML50058 and MSES regulated vegetation (defined watercourse) on ML50058 shall be avoided during clearing activities.[2]

The typical mining sequence and method is as follows:

- topsoil is stripped using dozers and/or scrapers and utilised in rehabilitation and/or is stockpiled adjacent to current mining area(s);
- overburden is stripped using dozers and/or scrapers and side-cast into the adjacent mining void;
    - side-cast overburden is shaped to provide a landform that assists rehabilitation and provides safe access for mobile plant;
    - some of this shaped landform is used to support operations (e.g. crudes stockpiling pads, haul roads and temporary operational/laydown areas) prior to final rehabilitation;
- crudes are selectively mine (typically using scrapers) under geological and grade control
    - the mined crudes are stockpiled on an adjacent ROM pad for reclaim after the mining campaign is complete;
- stockpiled crudes are reclaimed and transported to the plant pad on a campaign basis using a wheel loader and road trucks (e.g. side-tipping road trains); and
- rehabilitation is conducted using dozers and/or scrapers to shape the landform and spread topsoil (rehabilitation proceeds concurrently with overburden stripping).

1.4 Bentonite Processing

Bentonite clay is stored and processed on ML5902 as follows:

- moisture removal through solar drying aided by mechanical plant hoeing and, where required, the addition of sodium carbonate;
- mechanical drying, milling and screening;
- manual and mechanical packaging; and
- road transport from the site.

[1] Matters of State Environmental Significance
[2] https://qldglobe.information.qld.gov.au/ (accessed October 2023)

Mechanical processing operations is expected to occur on average fifteen (15) hours per day, five (5) days a week, twelve (12) months a year.

1.5 Notifiable Activities

The current status regarding notifiable activities identified within Miles Bentonite, in accordance with schedule EP Act, are as follows:

- Schedule 3 – 29(b)(i) the storage of petroleum products in tanks with more than 2500 litres capacity:
  - Storage of diesel fuel on ML5902;
  - Storage of diesel fuel during mining campaigns on ML5909 in standards compliant portable tanks; and
- Schedule 3 – 29(b)(iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia – more than 25000L capacity:
  - Storage of LPG gas on ML5902.

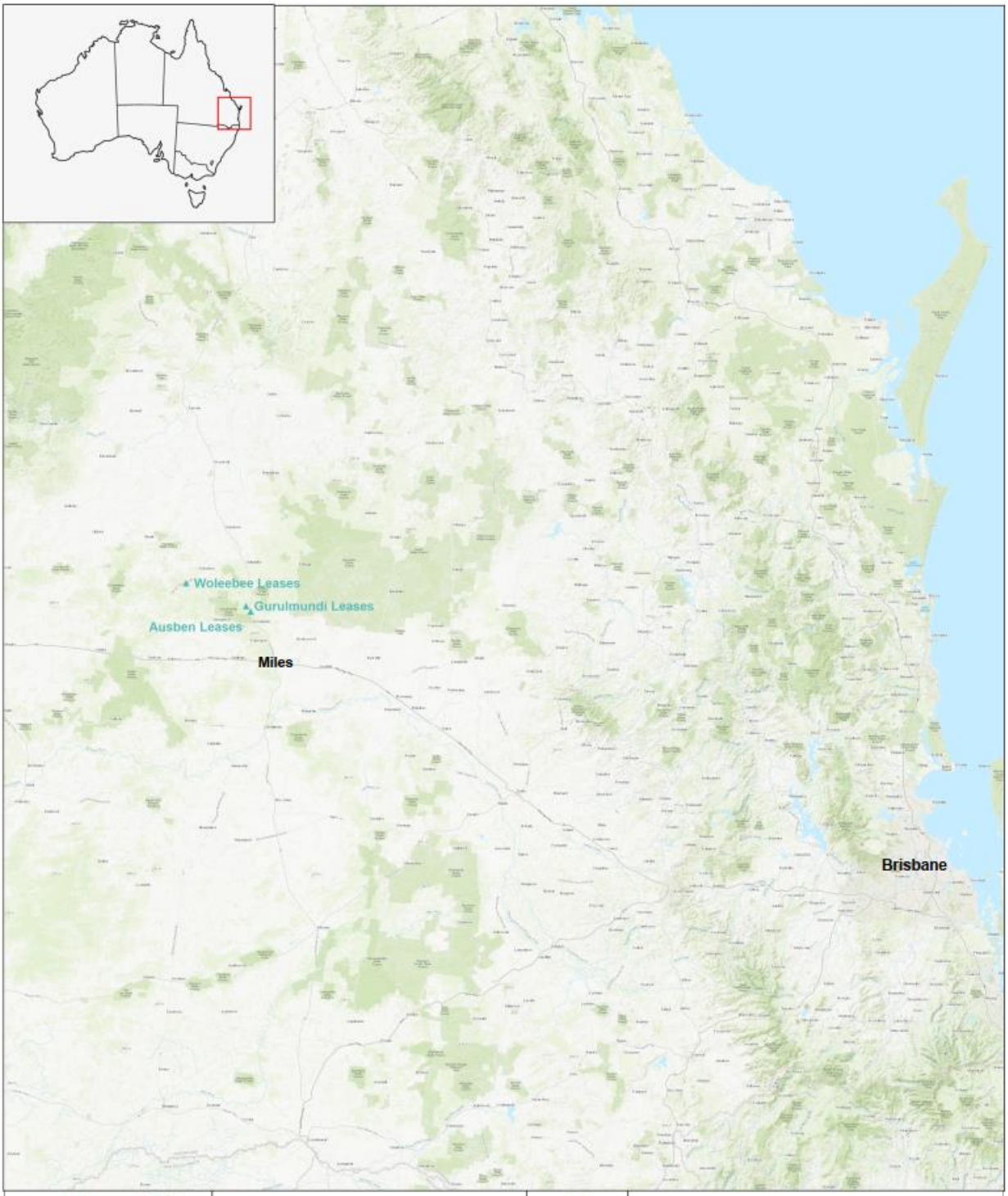


Figure 1: Site locality

2 MANAGEMENT COMMITMENT

Terrequip is committed to providing a high standard of environmental performance, protection and conservation of the natural environment at the site. This will be achieved through adopting best practice environmental management and the ongoing measurement, evaluation and review of performance to ensure continuous improvement.

Terrequip is committed to:

- complying with all legal and other obligations that apply to the site for the purpose of environmental protection;
- providing adequate resources to implement this SBMP and the associated environmental protection and monitoring measures; and
- monitoring compliance with this SBMP and seeking to continuously improve environmental performance at the site.

3 ROLES AND RESPONSIBILITIES

All personnel, including sub-contractors and visitors are responsible for environmental protection at the site. roles, responsibilities and reporting lines for environmental matters are described in **Table 2**.

Site organisation structure is illustrated in **Figure 2**.

Table 2: Roles and responsibilities

Role	Responsibilities	Reports to
Site Senior Executive (SSE)	• Responsible for all aspects of site safety, health, environment and community relations; • Ensure compliance with the SBMP; • Ensure compliance with Company Policy including risk management, incident reporting, safety and health obligations, environmental management, community liaison/management, and record keeping and reporting; and • Full responsibilities are described and outlined under the *Mining and Safety Quarrying Safety and Health Act 1999, Mining and Quarrying Safety and Health Regulation 2017, Environmental Protection Act 1994,* and *Planning Act 2016*.	Administering Authority & Mine Operator
Site Manager / Site Supervisor	• Ensure operations comply with all relevant regulatory and project requirements; • Ensure this SBMP is fully implemented, and environmental protection is not secondary to production requirements; • Liaise with regulatory authorities as required; • Ensure that all personnel understand, accept and are fit to carry out their obligations to environmental protection; • Seek relevant approvals for required works and/or changes to site conditions outside the limits of the applicable approvals permits and/or plans; • Conduct environmental incident investigation (as required); • Direct the immediate cessation of works where a real or potential risk of environmental harm exists; and • Comply with General Environment Duty (GED).	SSE
Staff and other personnel (includes sub-contractors and visitors)	• Regard environmental protection as a core theme in their actions; • Conduct operations in accordance with the SBMP to reduce risk of adverse environmental impacts; • Report to any defects in plant and/or equipment; • Keep the site and work place tidy; • Notify the Site Manager of any required works outside approved limits and/or unexpected changes to site conditions; • Assist with environmental incident investigation (as required0: • Cease works where a real or potential risk of environmental harm exists and notify the Site Manager / Site Supervisor; and • Comply with General Environmental duty (GED).	Site Manager / Site Supervisor

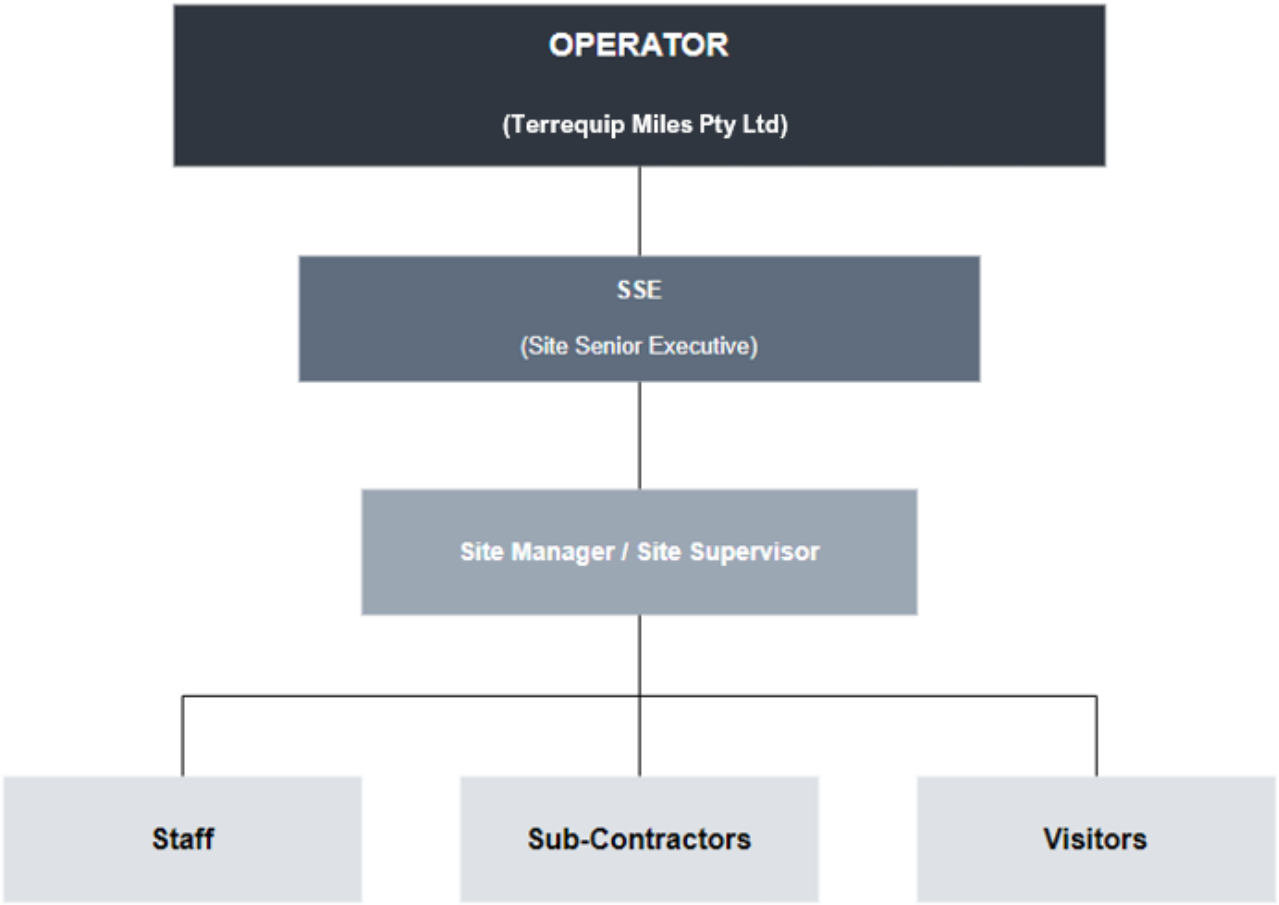


Figure 2: Organisational reporting structure

4 ENVIRONMENTAL MANAGEMENT

Best practice environmental management measures will be implemented to minimise the real and/or potential risk of environmental impact from mining operations at the site. Environmental management strategies are further detailed in Table to Table addressing the following:

- air quality;
- noise and vibration;
- traffic;
- waste;
- plant and equipment;
- bushfires;
- soil and water;
- flora and fauna (including pests and weeds); and
- visual amenity.

4.1 Air Quality

Due to the type of resource mined, the following activities have the potential to generate dust emissions on site:

- clearing, earthmoving and excavation work;
- operation of the screen plant and of stacker conveyors;
- operation of trucks including movement around and off site, loading and dumping haul loads;
- stockpiles;
- disturbed areas; and
- rehabilitation areas.

Table 3 summarises site environmental management of air quality.

Table 3: Environmental management of air quality

AIR QUALITY MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00699113) • *Environmental Protection Act 1994* • *Environmental Protection (Air) Policy 2019* **Australian Standards** • AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method • AS3580.9.6 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} high volume sampler with size-elective inlet – Gravimetric method of 2003 • AS4323.1–1995 Stationary source emissions – Method 1: Selection of sampling positions		
Objectives		
• Minimise impacts to air quality (dust, odour and contaminants) from site operations; and • Adhere to the relevant and applicable legislative requirements, guidelines and standards.		
Success Criteria		
• No complaints relating to air quality (including nuisance or offensive odours), dust or contaminants; • Dust deposition does not exceed 120mg/m^2 per day, averaged over one (1) month; • Particulate matter concentration with an aerodynamic diameter <10µm diameter (PM_{10}) does not exceed 150mg/m^3 over a 24-hour average time, at a sensitive place downwind of the operational land.		
Management Actions	**Responsibility**	**Frequency**
Restrict vehicle speed limits around site plant and stockpile areas (20km/hr) and the road to the main entrance (40km/hr), as well as: • haul roads (20km/hr); • light vehicle roads (20km/hr); • active mining areas (20km/hr); • manufacturing / drying pad (20km/hr); and • workshop areas (20km/hr).	All personnel	At all times
Sheet site haul roads with ironstone road base to provide good traction and reduce dust emissions.	Site Manager	At all times
Truck haul loads will be covered during transportation from site.	All personnel	At all times

AIR QUALITY MANAGEMENT

Management Actions		
Site operations shall be generally conducted during the following hours: • 24hrs (Monday to Friday) • 12 am to 1 pm (Saturday) and • Maintenance occasionally outside normal operating hours. Generally no scheduled operations on Sundays or Public Holidays (except in emergency).	Site Manager	At all times
Management Actions	**Responsibility**	**Frequency**
No unnecessary revving or idling of plant and/or machinery. Loader/excavator(s) to be turned off when not filling trucks.	Site Manger	At all times
Regular watering of haul roads via site water truck(s) during periods of dry weather and extended periods of reduced rainfall.	All personnel	At all times and as required
Maintain and operate plant and equipment within the manufacturer recommended performance specifications.	Site Manager	At all times
Install dust extraction systems wherever possible and practicable on site processing plant equipment.	Plant Operator	As required
Conduct a monitoring program for all approved release points (per EA Schedule B – Table 1) in compliance with AS4323.1–1995.	Site Manager	When a compliant is received
Install and maintain buffer controls (e.g. vegetation) to prevent nuisance or offensive air and dust to sensitive receptors, where required.	Site Manager	At all times
Corrective Actions		
Complaints and incidents relating to air and dust emissions shall be investigated by the Site Manager to identify and implement necessary corrective actions.		
Monitoring		
Monitoring of air and dust emissions shall be conducted at sensitive receptors upon written request by the administering authority in response to a complaint of nuisance.	Site Manager	Upon written request by the administering authority in response to a complaint
Air and dust emissions regularly monitored during periods of dry weather and extended periods of reduced rainfall.	Site Manager	As required
Reporting		
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

4.2 Noise and Vibration

The site does not conduct drilling or blasting activities. Minor vibration may be generated from the operation of excavators and loaders, movement of haul trucks and other heavy vehicles, truck loading and dumping, and screening activities. **Table 4** summarises site environmental management of noise and vibration.

Table 4: Environmental management of noise and vibration

NOISE & VIBRATION MANAGEMENT
Guidelines and Legislative Requirements
State: • Environmental Authority (EPML00382513) • *Environmental Protection Act 1994* • *Environmental Protection (Noise) Policy 2019* **Local:** • Maranoa Regional Council Local Law No. 3 (Community and Environmental Management) 2011 • Western Downs Regional Council Local Law No. 3 (Community and Environmental Management) 2011 **Guidelines:** • Department of Environment and Science – Noise Measurement Manual (ESR/2016/2195)
Objectives
• Minimise noise and vibration related disturbance to sensitive receptors; and • Adhere to the relevant and applicable legislative requirements, guidelines and standards.
Success Criteria
• No complaints relating to noise and/or vibration; • Presence of wildlife in areas surrounding the site; and • Noise monitoring does not exceed the following (per EA Schedule D – Table 1):

Noise level dB(A) measured as	**Noise measured at a 'noise sensitive place.' Average hourly A-weighted sound pressure levels, $L_{Ar,1\ hour}$**					
	Monday to Saturday			**Sundays and public holidays**		
	7am – 6pm	**6pm – 10pm**	**10pm – 7am**	**9am – 6pm**	**6pm – 10pm**	**10pm – 9am**
$L_{Ar,1\ hour}$	50	45	40	50	45	40

$L_{Ar,\ 1\ hour}$ = the specific noise level plus any adjustment for the character of the noise (tonal and/or impulsive) determined over a period of one hour. $L_{Ar,1\ hour}$ is expressed in terms of $L_{Aeq,\ 1\ hour}$.

Management Actions	Responsibility	Frequency
Site operations shall be generally conducted during the following hours: • 24hrs (Monday to Friday) • 12 am to 1 pm (Saturday) and • Maintenance occasionally outside normal operating hours. Generally no scheduled operations on Sundays or Public Holidays (except in emergency).	Site Manager	At all times
Maintain and operate plant and equipment within the manufacturer recommended performance specifications.	Site Manager	At all times
Maintain bunding structures on site to assist in minimising the environmental impacts of noise and/or vibration.	Site Manager	At all times

NOISE & VIBRATION MANAGEMENT

Management Actions	Responsibility	Frequency
Conduct a monitoring program to determine sources of significant noise and/or vibration.	Site Manager	When a compliant is received
Corrective Actions		
Complaints and incidents in relation to noise and vibration shall be investigated by the Site Manager to identify necessary corrective actions for implementation.		
Monitoring		
Monitoring of noise and vibration shall be conducted at sensitive receptors upon written request by the administering authority in response to a complaint of nuisance.	Site Manager	Upon written request by the administering authority in response to a complaint.
Monitoring of new work areas for real and/or potential impacts to environmental values.	Site Manager	At all times and when required
Obtain feedback though community consultation to ensure site operations are not impacting sensitive receptors.	Site Manager	Annually and as required
Reporting		
Complaint investigation monitoring results shall be provided to the administering authority within 14 days following completion of monitoring.	Site Manager	Within 14 days following the completion of monitoring
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

4.3 Traffic

Table 5 summarises site environmental management of traffic on site. A traffic plan for ML5902 is provided in **Appendix 3**

Table 5: Environmental management of traffic

TRAFFIC MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00382513) **Local:** • Maranoa Regional Council Subordinate Local Law No. 1.2)(Commercial Use of Local Government Controlled Areas and Roads) 2011 • Western Downs Regional Council Local Law No. 4 (Local Government Controlled Areas, Facilities and Roads) 2011		
Objectives		
• Safely and effectively manage the movement of traffic on site roads and on surrounding local roads.		
Success Criteria		
• No traffic incidents; and • No complaints relating to the movement of site vehicles on surrounding local roads.		
Management Actions	**Responsibility**	**Frequency**
Restrict vehicle speed limits around site plant and stockpile areas (20km/hr) and the road to the main entrance (40km/hr), as well as: • haul roads (20km/hr); • light vehicle roads (20km/hr); • active mining areas (20km/hr); • manufacturing / drying pad (20km/hr); and • workshop areas (20km/hr).	All persons	At all times
Enforce parking rules as follows, unless otherwise signed/stated: • no parking in the path of other vehicles; • flashing light must be left on when stopped and/or parked; • if parking on a slope, vehicle wheels must be chocked and/or angled into a wall or window; • no parking on pit ramps (except in an emergency); • no parking between a pit edge and/or pit edge; and • following guides parking in front/behind mobile equipment (**Figure 3**).	All persons	At all times
All vehicles must possess radio communication equipment and follow communication rules of the site while travelling on haul roads: • UHF radios tuned to appropriate channels as advised during site induction; and • light vehicles must request permission from heavy vehicle operators and must receive/confirm a verbal response prior to entering areas of heavy vehicle operation.	All persons	At all times
All vehicles driving on site shall switch on their headlights at all times (day or night) while the vehicle motor is running	All persons	At all times
Light vehicles will be separated from heavy vehicles wherever possible	All persons	At all times
All vehicles shall give way to heavy vehicles when travelling on haul roads.	All persons	At all times

TRAFFIC MANAGEMENT

Management Actions		
All vehicles shall follow the right-of-way priority as follows: 1. emergency vehicles 2. water trucks 3. dozers, excavators and/or graders 4. other heavy equipment 5. light vehicles	All persons	At all times
All private vehicles shall be escorted by Terrequip personnel	All persons	At all times
All vehicles shall be fitted and/or carry appropriate visibility gear: • high visibility pole and flag with reflective material; and • carry hi-vis clothing, safety cones and/or triangles, and have working hazard lights for use in an emergency.	All persons	At all times
Overtaking of vehicles is not permitting with the operating area, unless the vehicle is stationary, and permission is granted from the operator of the vehicle.	All persons	At all times
Slow-moving tracked vehicles and/or working graders may be overtaken under the following conditions: • the operator has clear vision of the road ahead; • there are no intersections in the vicinity of the manoeuvre; and • the operator has received/confirmed positive contact via radio from the operator of the slow-moving machine and advised them of the intention to pass. Overtaking is not permitted on ramps.	All persons	At all times
All pedestrians working in areas of heavy vehicle operations must carry a two-way radio tuned to the appropriate channels as advised during site induction or be supervised by site personnel who are carrying a two-way radio tuned to the appropriate channel.	All persons	At all times
Before existing vehicles, pedestrians shall request permission from heavy vehicle operators using a two-way radio and must receive/confirm a verbal response prior to entering areas of heavy vehicle operation.	All persons	At all times
Mobile phone devices are not permitted to be used in any mobile equipment unless they are mounted in a hands-free set.	All persons	At all times
Seat belts must be correctly fitted and worn by all drivers and passengers in any vehicle.	All persons	At all times
Heavy vehicles shall not pass under any power line without authorisation from the Site Manager (**Figure 3**).	All persons	At all times
Vehicles shall not enter loading and tipping areas unless required. All overload trucks (road trucks) must tip off in designated tipping areas only.	All persons	At all times

Corrective Actions
Complaints and incidents in relation to noise and vibration shall be investigated by the Site Manager to identify necessary corrective actions for implementation.

Monitoring		
Monitoring of new work areas for real and/or potential impacts to environmental values.	Site Manager	At all times and when required

TRAFFIC MANAGEMENT		
Monitoring		
Obtain feedback though community consultation to ensure site operations are not impacting sensitive receptors.	Site Manager	Annually and as required
Reporting		
Retain records of traffic incidents and/or complaints on site.	Site Manager	At all times; and Records to be retained for at least 5 years
Traffic management plan shall be auditing annually or when required i.e. changes are approved.	Site Manager	Annually and as required

Figure 3. Light vehicle parking in front or behind mobile equipment

4.4 Waste

The site is not listed on any Environmental Management Register or the Contaminated Land Register under the EP Act. Current and future planned development of the site is not at risk of causing serious environmental harm. **Table 6** summarises site environmental management of waste and a Waste Management Plan is provided in **Appendix 4**

Table 6: Environmental management of waste

WASTE MANAGEMENT		
Guidelines and Legislative Requirements		
Federal: • Waste Reduction and Recycling Regulation 2023 **State:** • Environmental Authority (EPML00382513) • *Environmental Protection Act 1994* • *Environmental Protection (Waste Management) Policy 2000* • *Waste Reduction and Recycling Act 2011* **Local:** • Maranoa Regional Council Local law No. 8 (Waste Management) 2018 • Western Downs Regional Council Local Law No. 8 (Waste Management) 2018		
Objectives		
• Manage waste in an environmentally sustainable manner; • Adhere to the waste and resource management hierarchy of avoid, reduce, reuse, recycle, recover, treat and dispose (*Waste Reduction and Recycling Act 2011)*; • Ensure stockpiled waste does not contribute to the generation of contaminated stormwater runoff; • Adhere to the relevant provisions of the *Environmental Protection (Waste Management) Policy 2000*; and • Implement all reasonable and practicable fire prevention measures.		
Success Criteria		
• No complaints relating to waste management; and • Waste does not result in the contamination of the land and/or stormwater runoff.		
Management Actions	**Responsibility**	**Frequency**
The site shall be kept clean and tidy at all times.	All persons	At all times
Waste shall be stored in appropriate bags/containers and housed in site utility areas until they can be transported for disposal at appropriately licensed facilities.	Site Manager	At all times
Waste shall not be burned or disposed of on site.	All personnel	At all times
Waste shall be located away from potential sources of ignition on site.	All personnel	At all times
Wherever possible and practicable to do so, waste shall be recycled, including drink cans, oils, cardboard and steel cutting edges on ground-engaging buckets and blades.	Site Manager	At all times and as required
Waste and/or overburden removal shall be schedule within backfilling works of previous extraction areas to minimise disturbance areas and assist with rehabilitation and stormwater management.	Site Manager	As required

WASTE MANAGEMENT		
Management Actions		
If waste stockpiles are planned, appropriate measures to minimise contaminated stormwater runoff shall be implemented.	Site Manager	As required
Waste tyres shall be appropriately managed by: • Stockpiling in volumes <3m in height and 200m^2 in area and at least 10m from any other tyre storage area; • Removing of grass and other materials within a 10m radius of scrap tyre storage areas; and • Removing all scrap tyres from site prior to rehabilitation.	Site Manager	At all times
Corrective Actions		
Incidents in relation to waste management and disposal shall be investigate by the Site Manager to identify necessary corrective actions for implementation.		
Monitoring		
Monitor site for any evidence of waste and improper management of waste at the site.	Site Manager	Weekly
Regular review or overburden handling and planning to ensure appropriate measures are taken to minimise contaminated stormwater.	Site Manager	Annually
Reporting		
Retain records and/or receipts of regulated waste removal from the site.	Site Manager	At all times; and Records to be retained for at least 5 years
Notify the administering authority of all relevant facts, matters and circumstances relating to events where waste has been removed from the licensed place and disposed in a manner which is not authorised by the environmental authority or is improper or unlawful.	Site Manager	At all times; and as soon the Site Manager becomes aware

4.5 Plant and Equipment

Table 7 summarises site environmental management of plant and equipment. Oil and fuel will be delivered to site via mobile service truck(s). Safety Data Sheets (SDS) are provided and Error! Reference source not found..

Table 7: Environmental management of plant and equipment

PLANT & EQUIPMENT MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00382513) **Australian Standards:** • AS1940 – Storage and Handling of Flammable and Combustible Liquids		
Objectives		
• Manage plant and equipment in an environmentally sustainable manner; • Ensure plant and equipment are operated, stored and maintained per manufacturer specifications; and • Ensure oil and fuel stored on site is stored appropriately and does not pose a real and/or potential risk to environmental values.		
Success Criteria		
• No environmental harm caused by spills and/or leaks of oil, fuel or other hazardous liquids from plant and/or equipment on site; and • No contamination of land due to the operation of plant and/or equipment on site.		
Management Actions	**Responsibility**	**Frequency**
Pre-start checks shall be conducted on all plant and equipment each day prior to mobilisation on site.	Operators	Daily and prior to mobilisation to site
Stored oil and fuel to be housed away from ignition sources.	Site Manager	At all times
Oil and fuel spill kits will be available in the event of any spills. These will be stored on the site service truck(s).	Site Manager	At all times
Spill shall be cleaned up immediately.	All personnel	At all times
Relevant Safety Data Sheets (SDS) to be kept at all oil and fuel storage location on site.	Site Manager	At all times
All used oil (from oil changes) shall be collected in oil recycling drums housed on site service truck(s).	Site Manager	At all times and as required
The following actions apply to refuelling plant and equipment on site: • Funnels, extended nozzles or quick release nozzles shall be used to minimise fuel spillage when fuelling equipment; and • A spill kit and fire extinguisher shall be carried by the refuelling vehicle.	Refuelling personnel	During refuelling
Personnel shall be appropriately trained in spill prevention and site spill response/control procedures.	Site Manager	At all times
No onsite disposal of wastes from spills or leaks.	All personnel	At all times
Appropriate fire extinguishers shall be provided in site vehicles for flammable and combustible chemicals.	Site Manager	At all times

PLANT & EQUIPMENT MANAGEMENT

Corrective Actions		
Incidents in relation to plant and equipment management shall be investigate by the Site Manager to identify necessary corrective actions for implementation.		
Monitoring		
Check and replenish spill kit contents.	Site Manager	Weekly and after a spill event
Ensure fuel, oil and other liquids are appropriately stored and in locations away from ignition sources.	Site Manager	At all times
Reporting		
Large spills and/or leaks that cause environmental harm shall be notified to the administering authority.	All personnel	As required
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

4.6 Bushfires

Western Downs Regional Council Planning Scheme maps the Gurulmundi and Ausben leases as an area of medium bushfire risk; and Maranoa Regional Council Planning Scheme maps the Woleebee leases as an area of low to medium bushfire risk. There is a section of mature native bushland towards the southern end of ML5907, to the east of ML5902, and across undeveloped areas of ML5898, ML5906 and ML5905. A Bushfire Management Plan (BMP) is provided in **Appendix 5** .

Table 8 summarises site environmental management for bushfires.

Table 8: Environmental management of bushfires

BUSHFIRE MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00382513) • *Fire and Emergency Services Act 1990* • *Fire and Emergency Services Regulation 2011* **Local:** • Maranoa Regional Council Local Law No. 3 (Community and Environmental Management) 2011 • Western Downs Regional Council Local Law No. 3 (Community and Environmental Management) 2011		
Objectives		
• Minimise as much as possible the risk and severity of bushfires starting and/or spreading on site; • Adherence to relevant provisions outlined in the *Fire and Rescue Services Act 1990, Fire and Rescue Service Amendment Act 2006*, and *Fire and Emergency Services Regulation 2011; and* • Adherence to directions provided by local authorities and emergency responders.		
Success Criteria		
• No severe bushfire events; and • No casualties or injuries to humans.		
Management Actions	**Responsibility**	**Frequency**
Maintain fire trails and location of site tracks.	Site Manager	At all times
No stockpiles containing potentially flammable materials will be stored on site.	Site Manager	At all times
Install and maintain fire protection and alert systems, particularly on large machinery (e.g. onboard fire suppression and handheld extinguishers).	Site Manager	At all times
Provide suitable training in fire emergency response procedures and use of fire safety equipment	All personnel	At all times
Corrective Actions		
Incidents in relation to bushfires and bushfire management shall be investigate by the Site Manager to identify necessary corrective actions for implementation.		
Monitoring		
Regular checks and maintenance of fire protection and alert systems to manufacturer and industry standards.	Site Manager	As required by manufacturer and industry standards

BUSHFIRE MANAGEMENT

Reporting		
Notify local authorities and emergency responders of bushfire events by calling triple zero (000).	All personnel	At all times
Submit a 'Form 5A' if any of the following occurs as a result of a bushfire event: • fatalities; • high potential incidents (HPIs); • diseases; or • lost time injuries (LTIs)[1]	Site Manager	When required (refer to **Section 8**)
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

[1] *Department of Natural Resources, Mines and Energy 'Queensland mining industry incident report manual' (July 2019)*

4.7 Soil and Water

Condition C2 of the EA requires a Site Water Management and Monitoring Plan (SWMMP). The most recent version of the SWMMP is provided in **Appendix 6** and details site procedures for managing stormwater and sediment during high rainfall events. The SWMMP was prepared in accordance with condition C2-3. **Table 9** summarises site environmental management of soil and water.

Table 9: Environmental management of soil and water

SOIL & WATER MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00382513) • *Environmental Protection Act 1994* • *Environmental Protection (Water) Policy 2009 Dawson River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Dawson River Sub-basin except the Callide Creek Catchment* (published September 2011) **Guidelines:** • ESR/2015/1653 Stormwater and environmentally relevant activities (DES, 2014)		
Objectives		
• Monitor and manage contaminant limits to receiving waters within guideline limit values for protection of aquatic ecosystems; • No direct and/or indirect release of contaminants to any groundwater aquifers; • No adverse impacts to water quality in Little Tree Creek; and • No adverse impacts to soil or water from spills and/or leaks from plant or equipment.		
Success Criteria		
• Implementation of effective erosion and sediment controls; and • Mitigation and/or management of contaminant concentrations during controlled releases of stormwater, sediment dam and/or process water to receiving waters in accordance with:		

Parameter	Minimum	Maximum
pH	6.0	8.0
Total Dissolved Solids	-	4000mg/L
Sulphate	-	1000mg/L
Calcium	-	1000mg/L
Magnesium	-	600mg/L

Management Actions	Responsibility	Frequency
Progressively rehabilitate the site and ensure rehabilitation areas are seeded soon after topsoiling to reduce erosion.	Site Manager	As required
Spills and/or leaks shall be cleaned up immediately.	All personnel	At all times
Minimise the size of disturbed areas.	Site Manager	At all times
Collect and treat contaminated stormwater runoff from operational areas via sediment controls.	Site Manager	At all times
Maintain roads and ramps to minimise erosion.	Site Manager	At all times

SOIL & WATER MANAGEMENT		
Management Actions	**Responsibility**	**Frequency**
Batters should be no steeper than 1V:3H.	Site Manager	At all times
Inlets, spillways, drains and/or other sediment controls will be designed to IECA Best Practice Erosion and Sediment Control standards.	Site Manager	At all times
Corrective Actions		
Incidents related to soil and water management shall be investigated by the Site Manager to identify appropriate and suitable corrective actions for implementation.		
Monitoring		
Annual audit of sediment controls and on site erosion conducted prior to the wet season.	Site Manager	Annually prior to the wet season
Regular monitoring of sediment loads in site sediment control basins.	Site Manager	Monthly
Reporting		
Uncontrolled releases of contaminated water from site must be reported to the administering authority within 24 hours of the release commencing.	All personnel	As required
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

4.8 Flora and Fauna (including Pests and Weeds)

The Rehabilitation Management Plan is described in **Section 5** of this SBMP and a Final Land Use and Rehabilitation Plan (FLURP) is provided in **Appendix 7** . The RMP details how rehabilitation will be managed and conducted on site and the FLURP details how the post-mining land use (PMLU) will be achieved. **Table 10** summarises site environmental management for flora and fauna, including pests and weeds.

Table 10: Environmental management of flora and fauna (including pests and weeds)

FLORA & FAUNA MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00382513) • *Environmental Protection Act 1994* • *Nature Conservation Act 1992* • *Vegetation Management Act 1999* • *Biosecurity Act 2014* **Guidelines:** • General Guide to the Vegetation Clearing Codes – Accepted development vegetation clearing codes (DES, 2020)		
Objectives		
• Limit widespread invasion of pest and/or weed species in disturbed and undisturbed areas; and • No unauthorised clearing of vegetation.		
Success Criteria		
• No unauthorised harm to native flora and fauna; • No unauthorised clearing of vegetation; • No introduction or spread of weeds listed under the *Biosecurity Act 2014*.		
Management Actions	**Responsibility**	**Frequency**
Flora and Fauna:		
Restrict vehicle speed limits on haul roads (10km/hr) with appropriate signage.	All persons	At all times
Minimise vegetation clearing as much as reasonably practicable.	Site Manager	During clearing works.
Minimise disturbance from the creation of new roads as much as reasonably practicable.	Site Manager	At all times
Vegetation mapping and flora trigger maps shall be consulted prior to any clearing. Once consulted, clearing shall be conducted with best practice methods and in accordance with relevant and appropriate guidelines.	Site Manager	At all times
No animals shall be deliberately killed and/or otherwise harmed.	All persons	At all times
Fauna observed on site shall be allowed to move on at their own accord. There shall be no interference and/or touching and/or feeding the fauna.	All persons	At all times
Ensure provision of water storage(s) for local fauna are placed in suitable locations around the site.	Site Manager	At all times and when required
Implement site RMP and FLURP to ensure long-term rehabilitation goals and PMLU are achieved.	Site Manager	At all times

FLORA & FAUNA MANAGEMENT

Pests and Weeds:		
Vehicles, plant and/or equipment that has or is suspected of coming in contact with weed infested areas shall be washed down and inspected prior to entering and/or leaving the site.	Site Manager	As required
Weed management activities shall be conducted as required to manage and control weeds listed under the *Biosecurity Act 2014*.	Site Manager	As required
Management Actions	**Responsibility**	**Frequency**
Pests and Weeds:		
No domestic animal shall be brought to site.	Site Manager	At all times
Feeding of wild animals is prohibited.	All persons	At all times
Where required, pest animal control shall be conducted contractors holding appropriate licences and permits.	Site Manager	As required
Where required, only registered herbicides shall be used by an appropriately licenced weed sprayer and in accordance with the *Agricultural Chemicals Distribution Control Act 1966.*	Site Manager	As required
Corrective Actions		
Incidents related flora and fauna (including pests and weeds) management shall be investigated by the Site Manager to identify appropriate and suitable corrective actions for implementation.		
Monitoring		
Monitor compliance with clearing codes per relevant guidelines.	Site Manager	As required
Monitor weeds and pests to determine if management actions are required.	Site Manager	As required
Reporting		
Identification of invasive plants and/or animals listed as Category 1 or 2 restricted matter under the *Biosecurity Act* 2014 shall be reported to Biosecurity Queensland within 24 hours of identification by calling 13 25 23.	Site Manager	Within 24 hours of identification
Record all native flora and fauna sightings observed on site, particularly around operational areas (e.g. pits and processing area).	All personnel	At all times
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

4.9 Visual Amenity

Visual amenity of the mine particularly near the entrance/mine access road is shielded via the preservation of a vegetation buffer along Gurulmundi Road and the Leichhardt Highway. Sections of the site are exposed due to the use of the land for grazing by the landholder however, these areas are less visible from local roads. The surrounding landscape is characterised by undulating and vegetated hills zoned for rural land use per the Maranoa and Western Downs Regional Council planning schemes[3,4]. Per the site FLURP (**Appendix 7**), the land will be returned to a post-mining land use of marginal grazing. **Table 11** summarises site environmental management of visual amenity.

Table 11: Environmental management of visual amenity

VISUAL AMENITY MANAGEMENT		
Guidelines and Legislative Requirements		
State: • Environmental Authority (EPML00382513) • *Environmental Protection Act 1994* **Local:** • Maranoa Planning Scheme 2017 (Version 5) • Western Downs Regional Council Planning Scheme 2017 (Amendment 1)		
Objectives		
• Minimise visual amenity impacts to local community; and • Work towards achieving a post-mining land use that is compatible with existing landscape and land uses.		
Success Criteria		
• No complaints relating to visual amenity.		
Management Actions	**Responsibility**	**Frequency**
Maintain vegetation buffer along local roads to protect visual amenity.	Site Manager	At all times
Limit, wherever reasonable and practicable, disturbance and clearing to areas required for mining operations.	All personnel	At all times
Progressively rehabilitate the site to achieve suitable post-mining land uses.	Site Manager	At all times
Corrective Actions		
Incidents related to visual amenity management shall be investigated by the Site Manager to identify appropriate and suitable corrective actions for implementation.		
Monitoring		
Facilitate community consultation to obtain feedback related to visual amenity.	Site Manager	Annually and as required
Regular monitoring vegetation buffers.	Site Manager	Monthly

[3] Maranoa Regional Council. (2017). Maranoa Planning Scheme Version 5 – 6.2.1 Rural Zone Code.
[4] Western Downs Regional Council. (2019). Western Downs Planning Scheme 2017 (Amendment 1) – 6.2.10 Rural Zone.

VISUAL AMENITY MANAGEMENT

Reporting		
Uncontrolled releases of contaminated water from site must be reported to the administering authority within 24 hours of the release commencing.	All personnel	As required
Monitoring results, as required by the environmental authority, shall be kept for a minimum of five (5) years and be made available for inspection upon request by the administering authority.	Site Manager	At all times; and Records to be retained for a minimum of 5 years

5 REHABILITATION MANAGEMENT PLAN

Where disturbed land at the site will not be subject to any further disturbance and/or is no longer required by mining operations, it will be progressively rehabilitated. rehabilitation will be planned and executed to achieve the following rehabilitation objectives:

- safe for humans and wildlife;
- non-polluting;
- stable;
- able to sustain an agreed post-mining land-use in accordance with the site *Final Land Use and Rehabilitation Plan*;
- revegetated with species endemic appropriate to achieve the agreed post-mining land use and free of declared pest species;
- compliant with the *Final Land Use and Rehabilitation Plan*; and
- compliant with all conditions of the site Environmental Authority (EPML00382513).

A copy of the FLURP is provided in **Appendix 7** .

Land disturbed by mining activities shall be rehabilitated in accordance with the post-mine land descriptions below.

Table 12: Final land use and rehabilitation schedule

Disturbance Type	Post-Mine Land Description	Post-Mine Land Capability Classification[1]
Infrastructure	Marginal Grazing	vii
ROM Pad and Stockpiles	Marginal Grazing	vii
Haul Roads	Marginal Grazing	vii
Topsoil	Marginal Grazing	vii
Pits	Marginal Grazing	viii
ML50058	Water Storages	n/a
Sediment Dams and Stormwater Controls	Water Storages	n/a

[1] *"land capability" as defined in the DME 1995 Technical Guideline for Environmental Management of Exploration and Mining in Queensland*

The rehabilitation plan addresses the following matters:

- erosion management;
- weed management; and
- rehabilitation management.

5.1 Erosion Management

Erosion can have a significant impact to achieving successful rehabilitation outcomes and impact rehabilitation schedules. It is important to consider and apply appropriate erosion mitigation controls on site particularly during earthmoving works. erosion controls implemented on site may include:

- diversion bunds;
- contour drains;
- catch drains with rock bars/check dams; and
- temporary controls as required (e.g. sediment fencing).

Site operators will implement the following additional controls:

- limit disturbance to areas required for mining operations;
- install erosion controls (described above) where required; and
- reduce site and vehicle access to and across rehabilitation areas to promote natural regrowth.

5.2 Weed Management

Weeds can have a significant impact on achieving successful rehabilitation outcomes and impact rehabilitation schedules. it is important to consider and apply appropriate best practice weed management to limit and prevent the spread of weeds, particularly weeds listed under the *Biosecurity Act 2014*. An appropriate weed management plan shall be implemented on site to effectively manage the spread of weeds. this plan will include weed management via:

- chemical controls;
- mechanical controls;
- biological controls; and
- manual controls.

These may include, but are not limited to:

- wash down and inspection of vehicles, plant and/or equipment that has or is suspected of coming into contact with weeds; and
- the use of registered herbicides administered by appropriately licensed contractors under the *Agricultural Chemicals Distribution Control Act 1996*.

In the event registered herbicides are required, they will be appropriately stored per relevant Safety Data Sheets (SDS).

In the event weeds are found in sensitive areas (e.g. flora trigger areas, essential habitat, etc.), they will be removed via manual control.

5.3 Rehabilitation Management

5.3.1 Final Land Use

Operational areas of the site are planned to have a final land use of marginal grazing and/or water storage (i.e. for designated pits and sediment dams) to support livestock watering and/or agricultural land uses.

Undisturbed areas of the site are planned to have a final land us of marginal grazing (if existing pre-mining) and/or native ecosystem. This is further detailed in the site FLURP (**Appendix 7**).

5.3.2 Watering Regime

During the initial stages of rehabilitation (within the first 6 to 12 months of commencing), a watering regime may be required to support the establishment and growth of grass pasture species and/or planted tube stocks, particularly during extended dry periods. The watering regime will need to be appropriately planned to ensure it is suitable and sufficient for the rehabilitation area considering natural rates of daily evaporation and susceptibility of soil erosion. Water will be sourced from site water storage(s), as required and where available.

5.3.3 Topsoil Management

Successful rehabilitation to support ecosystem or agricultural post-mining land uses is underpinned by the reconstruction of healthy soil profiles. Soil structure and soil chemical properties can be influenced by a range of practices, including[5]:

- deep ripping to reduce compaction;
- addition of chemical ameliorants to reduce dispersion;
- organic matter addition to improve particle aggregation;
- fertilisers to address macro and micronutrient deficiencies; and
- irrigation to stimulate natural soil forming processes.

Topsoil will be managed on site using best practice methods including, but not limited to the following:

- limit topsoil stockpile heights to 2m maximum;
- prioritise direct placement of removed topsoil onto rehabilitation areas;
- if required to stockpile, limit duration topsoil is stockpiled for a period of less than 12 months;
- seed topsoil stockpiles with a fast growing cover crop to protect against surface erosion; and
- implement erosion control measures (e.g. sediment barriers, fences, etc.)

5.3.4 Scheduling Rehabilitation Activities

[5] Queensland Government. (2022). Research brief – topsoil deficits affecting mine rehabilitation in Queensland. Office of the Queensland Mine Rehabilitation Commissioner, State of Queensland.

Best practice management requires scheduling rehabilitation activities to commence as soon as practicable when land becomes available. The site has progressively rehabilitated and continues to progressively rehabilitate areas no longer required for mining operations.

Typically, progressive rehabilitation of pit areas will commence within 12 months of the resource being exhausted in the area, and if the area will no longer be required by mining operations. Scheduling of the commencement of rehabilitation can vary and is dependent on mine production levels. Rehabilitation and scheduling is described in the FLURP (**Appendix 7**) and will be further detailed in the site Progressive Rehabilitation and Closure Plan and PRCP Schedule.

5.3.5 Monitoring and Reporting

Rehabilitation areas shall be regularly monitored to assess rehabilitation performance and identify rehabilitation requiring repair. Monitoring is recommended to be undertaken monthly until rehabilitation areas become self-sustaining.

Rehabilitation monitoring and reporting shall include, but is not limited to:

- ensure rehabilitation areas are clearly identifiable and delineated;
- preventing general traffic access to and/or across rehabilitation areas;
- presence of erosion and effectiveness of controls;
- evidence of natural regrowth;
- evidence of deteriorated rehabilitation requiring repair;
- presence and/or evidence of native flora and fauna; and
- presence and/or evidence of pest and/or weed species.

Monitoring and reporting of rehabilitation areas shall include the keeping of appropriate records and/or rehabilitation measures implemented including the taking of photographs demonstrative of rehabilitation achieved. these records shall be used to inform annual rehabilitation progress reports. Records of annual rehabilitation progress reports shall be kept on site and be made available to the administering authority upon request.

6 COMPLAINT MANAGEMENT

The Site Manager shall maintain and update the Complaint Log (**Appendix 8**) for all complaints received. In the event a complaint is received, the following details must be recorded:

- time and date of complaint;
- details of complaint;
- type of communication (telephone, letter, personal, etc.);
- name, contact address and contact telephone number of complainant (note – if the complainant does not wish to be identified then "Not identified" is to be recorded);
- response and investigation undertaken as a result of the complaint;
- name of person responsible for investigating complaint; and
- action taken as a result of the complaint investigation and signature of responsible person.

A record of complaints shall be maintained for a period of not less than three (3) years. **Figure 4** illustrates the complaint management process to be adopted.

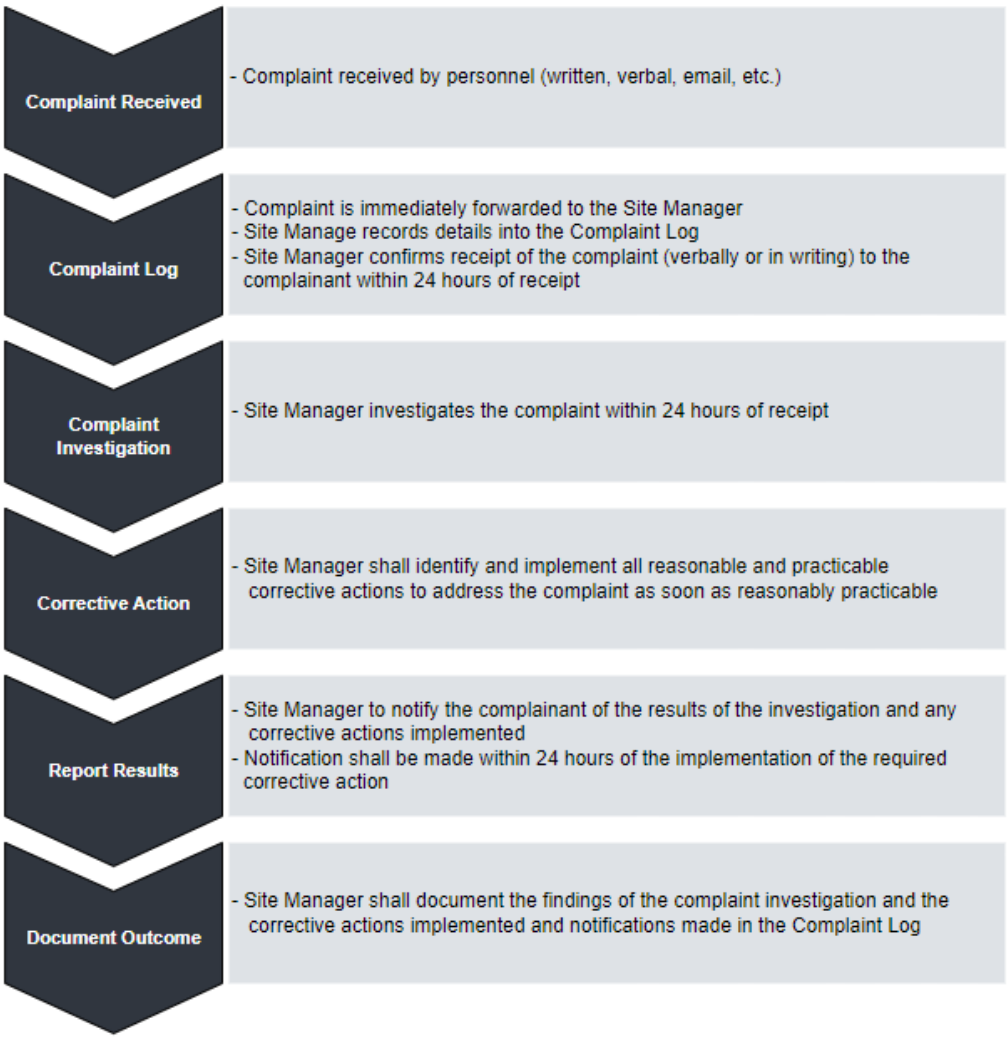


Figure 4: Complaint management process

7 ENVIRONMENTAL HAZARDS, INCIDENTS AND EMERGENCIES

7.1 Environmental Harm Categories

Environmental harm is a serious impact, or potentially serious impact on an environmental value defined under the EP Act. Environmental harm may be caused by an activity directly or indirectly as a result of the activity, or from the combined effects of the activity and other activities or factors.

The EP Act categorises environmental harm into three (3) categories: nuisance, serious or material (**Table 13**).

Table 13: Environmental harm as defined in the *Environmental Protection Act 1994*

Category	Definition	Internal reporting required?	External reporting required?
Nuisance	**An unreasonable interference or likely interference with an environmental value caused by:** • Aerosols, fumes, light, noise, odour, particles or smoke; or • An unhealthy, offensive or unsightly condition because of contamination; or • Another way prescribed by regulation.	Yes	Yes[1]
Material	**Environmental harm (other than nuisance) that:** • That is not trivial or negligible in nature, extent or context; or • That causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount but less than the maximum amount or • Results in cost of more than the threshold amount but less than the maximum amount being incurred in taking appropriate action to– - prevent or minimise the harm; and - rehabilitate or restore the environment to its condition before the harm.	Yes	Yes
Serious	**Environmental harm (other than nuisance) that:** • Is irreversible, of a high impact or widespread; or • Caused to– - an area of high conservation value; or - an area of special significance (e.g. Great Barrier Reef World Heritage Area); or • Causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount; or • Results in costs of more than the threshold amount being incurred in taking appropriate action to– - prevent or minimise harm; and - rehabilitate or restore the environment to its condition before the harm	Yes	Yes

[1]External reporting is only required if nuisance environmental harm is in breach of a condition of the site Environmental Authority

7.2 Environmental Hazards, Incidents & Emergencies

All environmental hazards, incidents and emergencies must be reported to the Site Manager as soon as possible and no longer than 24-hours after becoming aware of the event.

All hazards, incidents and emergencies shall be investigated by the Site Manager, and other relevant personnel, to identify the cause of the incident and to identify appropriate corrective actions to prevent recurrence. Corrective actions applied must be evaluated against the hierarchy of controls.

In the event an environmental hazard, incident or emergency is identified, this SBMP may require review and amendment as deemed necessary to minimise recurrence.

7.3 Incident Management & Investigation

All incidents shall be investigated by the Site Manager to determine the following:

- nature, type, location and extent of the incident and the affected area;
- actual and/or potential environmental impacts of the hazard, incident or emergency;
- measures required to stop additional environmental harm;
- remedial measures required to correct any environmental harm;
- appropriate management strategies to implement to prevent recurrence; and
- relevant regulatory authorities and incident reporting requirements.

The requirements for the environmental assessment of impacts of an incident shall be determined by the Site Manager who may seek advice and guidance from an environmental consultant. If an incident involves serious or material environmental harm, or a breach of a condition of the Environmental Authority, the regulatory authority may also advise and/or direct the environmental assessment.

The assessment may include environmental monitoring of a contaminant release. Based on the nature and type of the incident, the Site Manager, in consultation with their environmental consultant, shall determine:

- sampling and analytical requirements; and
- applicable guidelines or thresholds to apply to data for assessing compliance and level of impact.

7.4 External Reporting of Material or Serious Environmental Harm

All persons have a duty to notify the Department of Environment and Science of incidents or emergencies that cause or threaten material or serious environmental harm. The department's *Duty to Notify of Environmental Harm Guideline*[6] should be consulted when notification is required or to determine if notification is required (**Appendix 10**).

[6] DES. (2023). Guideline – Duty to notify of environmental harm (ESR/2016/2271) Version 4. Department of Environment and Science, Queensland Government.

Environmental hazards, incidents and/or emergencies that cause or threaten material or serious environmental harm shall be reported in accordance external reporting requirements described in **Table 14**.

Table 14: External reporting of material or serious environmental harm

Reported by	Reported to	Reporting timeframe	Reporting method
SSE	DES	Within 24 hours of becoming aware of the event[1]	Verbal initially followed by written notification
Site Manager	SSE and DES	Within 24 hours of becoming aware of the event[1]	Verbal initially followed by written notification
Staff, sub-contractors or visitors	Site Manager	Within 24 hours of becoming aware of the event	Verbal or written notification
	If Site Manager cannot be contacted, attempt to notify SSE		
	If Site Manager and SSE cannot be contacted, notification must be made directly to DES	Within 24 hours of becoming aware of the event	Verbal initially followed by written notification

[1] *the 24 hour period commences as soon as the SSE and/or Site Manager is first notified*

7.5 Notification of Emergencies and Incidents

As soon as practicable after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of the site EA must be reported to the administering authority as soon as possible. Note, as soon as possible means as soon as the Site Manager and/or SSE is made aware of the notifiable emergency and/or incident.

The notification of emergency and/or incidents must include, but is not limited to:

- name of the EA holder;
- EA number;
- the location of the emergency and/or incident;
- name and phone number of the designated contact person(s);
- time of the release;
- time the EA holder became aware of the release;
- details the suspected cause of the release;
- detail the environmental harm and/or environmental nuisance caused, threated, or suspected to be caused by the release; and
- actions taken to prevent any further release and mitigate any environmental harm and/or environmental nuisance caused by the release.

8 EMERGENCY RESPONSE

This section provides an overview of response requirements for environmental emergency that could reasonably be expected to occur at the site during operations. Incident reports and investigations are to be completed for any emergency event that occurs at the site.

In the event an incident occurs, the Queensland Mining Industry Incident Report Manual[7] and Incident Notification Flowchart should be consulted (**Figure 8**).

The designated muster point is located at the closest Site Office and Car Park area.

8.1 Site Emergency Response Procedure

In the event of an emergency, the following steps shall be followed:

1. **SSE and/or Site Manager will notify all persons on site (via radio) of the emergency and direct all persons to the Muster Point (Site Office and Car Park area);**
2. **SSE and/or Site Manager will proceed to the Must Point and confirm all persons on site are accounted for;**
3. **Assessment of Emergency shall be conducted by the appropriate Site Authority Contact;**
4. **All site persons to remain at the Muster Point until the SSE and/or Site Manager and/or Site Authority Contact declares the area is safe and return to work instructions are provided;**
5. **Risk Assessment shall be completed for any work areas impacted by an emergency;**
6. **If required, the SSE and/or Site Manager shall notify relevant administering authorities of the emergency and steps taken to control the event; and**
7. **If required, an Incident Investigation shall be conducted to determine the cause of the emergency and identify corrective actions to prevent the emergency from occurring in future.**

All persons on site shall not disturb the scene of an emergency other than to protect against further injury and/or to prevent further environmental harm.

[7] DNRM. (2019). Queensland mining industry incident report manual – Instructions for completion of on-line incident report and monthly summary. Department of Natural Resources, Mines and Energy, Queensland Government.

8.2 Emergency Responders & Vehicle Access

In the event emergency responders have been contacted and require access to the site, coordinates to be provided are listed on the following pages.

In the event mobile service coverage is unavailable on site, the site office landline shall be used. A designated site personnel shall be positioned at the main access gate to flag and direct emergency responders to the emergency.

Table 15: Emergency responders vehicle access latitude and longitude coordinates

Location	Coordinates	
	Latitude	Longitude
Gurulmundi leases (access via ML5902)	26°25'19.40"S	150°3'12.37"E
Ausben leases (access via ML5909)	26°27'2.11"S	150°4'2.74"E
Woleebee leases (access to ML5900)	26°19'58.70"S	149°47'24.35"E
Woleebee leases (access to ML5901)	26°20'9.27"S	149°46'49.48"E

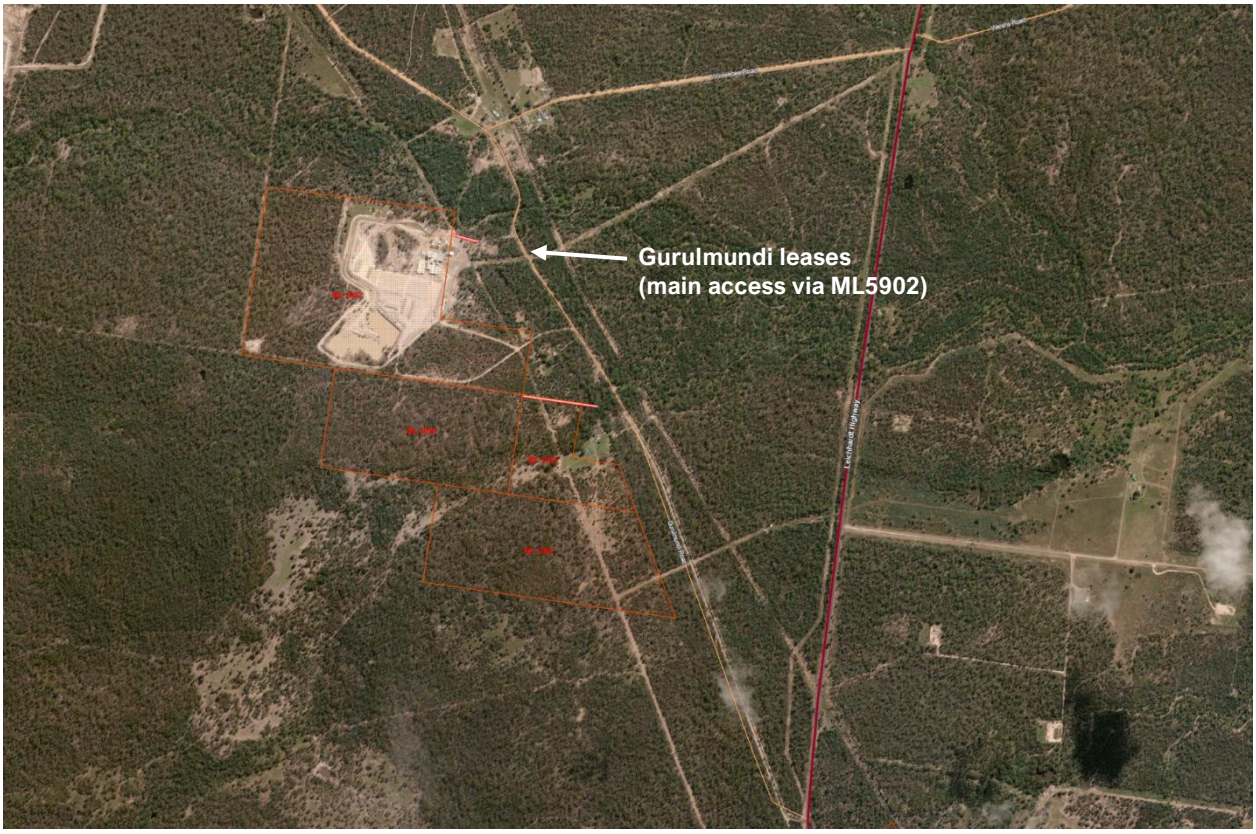


Figure 5: Emergency responders vehicle access location map (Gurulmundi leases)

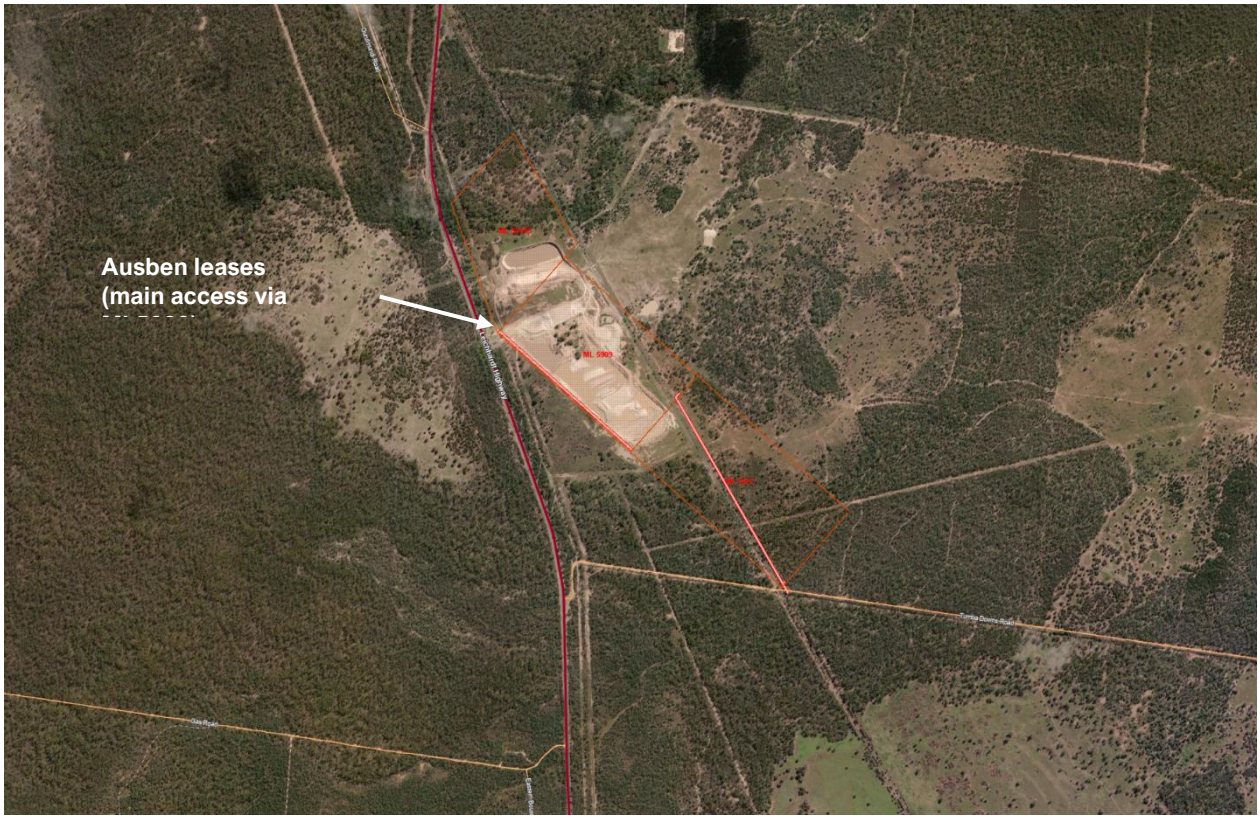


Figure 6: Emergency responders vehicle access location map (Ausben leases)

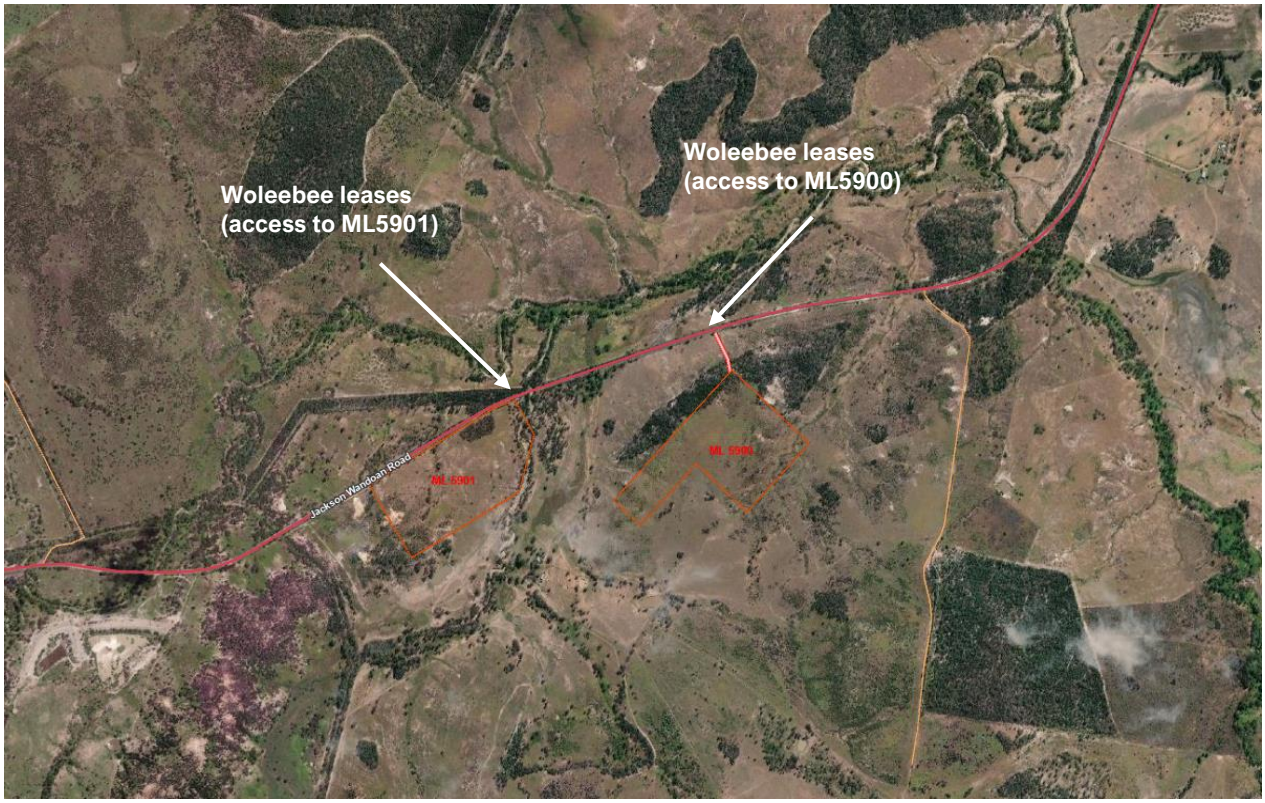


Figure 7: Emergency responders vehicle access location map (Woleebee leases)

8.3 First Aid

First aid kits will be located on the service truck(s) at all times and in the site office. The Site Manager will be responsible for ensuring kit contents are replenished and adequately maintained. Appropriate signage shall be installed on vehicles to ensure the location of the closest first aid kit is known.

Person(s) appropriately qualified in Applied First Aid training shall be employed and present on site at all times during site operational hours.

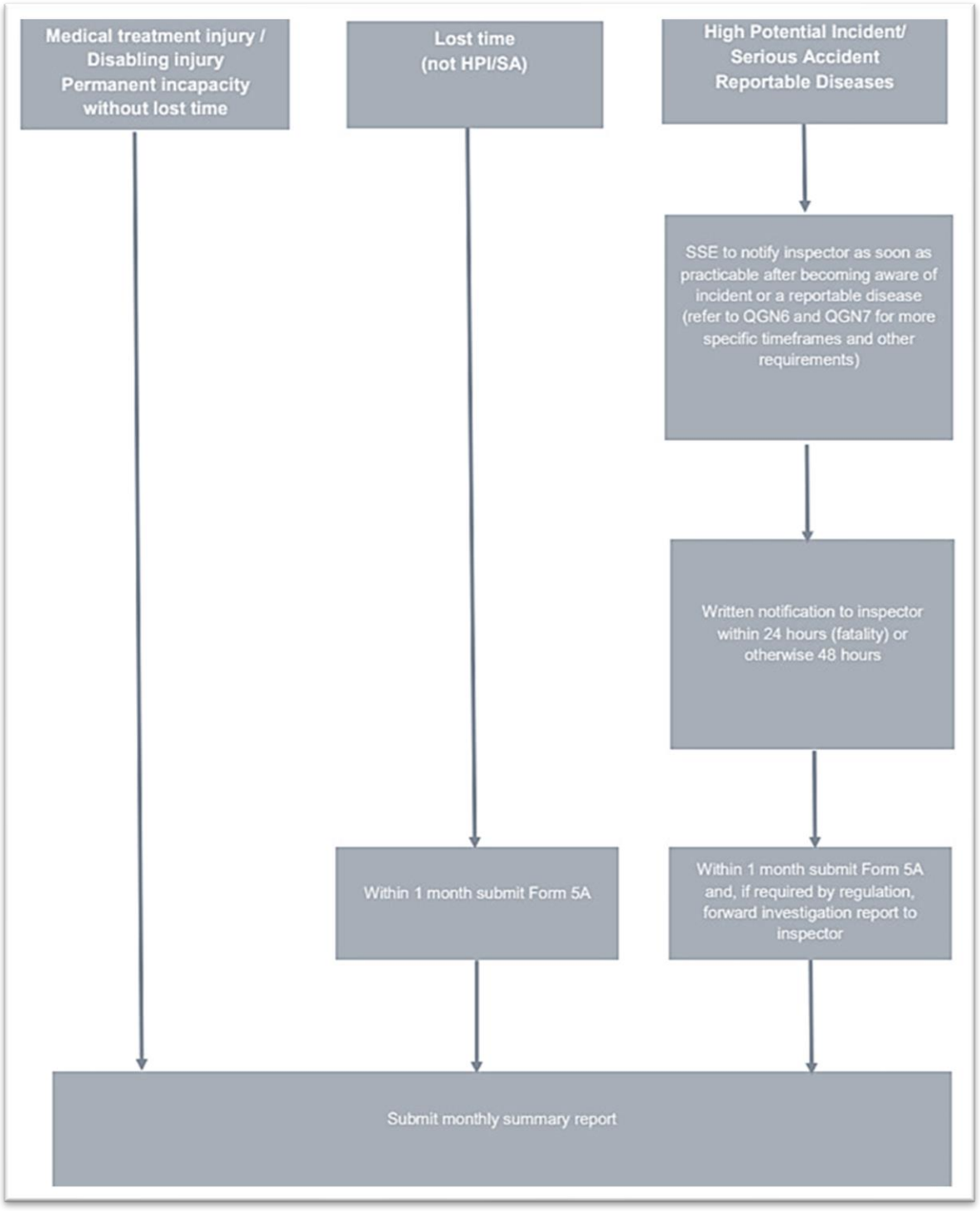


Figure 8: Incident notification flowchart (QMIIR)

8.4 Fire

Fires have the potential to threaten the health and safety of people, cause environmental harm and damage to infrastructure and equipment. The risk of fire at the site will be reduced by the following measures:

- provision of firefighting equipment (e.g. fire extinguishers);
- maintain plant and equipment in accordance with manufacturer specifications;
- training site personnel in fire emergency response procedures and use of fire safety equipment; and
- flammable or combustible liquids stored at the site will be managed in accordance with relevant SDS to minimise risk of ignition.

8.5 Hazardous Substances

Hazardous substances are those which have the potential to harm human health and the environment. Where used on site, hazardous substances must be stored as specified in relevant Safety Data Sheets. **Table 16** summarises hazardous substances likely to be present on site. Copies of Safety Data Sheets are provided in Error! Reference source not found..

Table 16: Register of hazardous substances

Substance Type	Description	Combustible Liquid Class	Safety Data Sheet
Diesel	-	C1	53642
Hydraulic Oil	-	Not Classed Hazardous	55327
Engine Oil	15W-40 multi-grade	Not Classed Hazardous	55579
Gear Oil Multi-grade	80W-90 multi-grade	Not Classed Hazardous	55562
Transmission Fluid	STF	Not Classed Hazardous	55321
Unleaded Petrol	ULP	C1	53547
Brake Fluid	-	C2	55385

8.6 Spill Response

Chemical spills, such as from oil or fuel, have the potential to threaten the safety and/or health of people, become a fire hazard and/or cause environmental harm. In the event of a chemical spill, Safety Data Sheets (SDS) for spill clean-up procedures and any necessary Personal Protective Equipment (PPE) should be consulted.

Spill kits shall be kept on site service truck(s). equipment contained in the spill kit shall be replenished after use, and equal to the specified list contained with the spill kit. The Site Manager shall be responsible for regularly inspecting the spill kit per manufacturer recommendations and ensure any missing items are replaced.

If a spill cannot be safely contained and controlled with onsite resources, the event shall be immediately referred to emergency services by calling triple zero (000). **Figure 9** illustrates the spill response procedure.

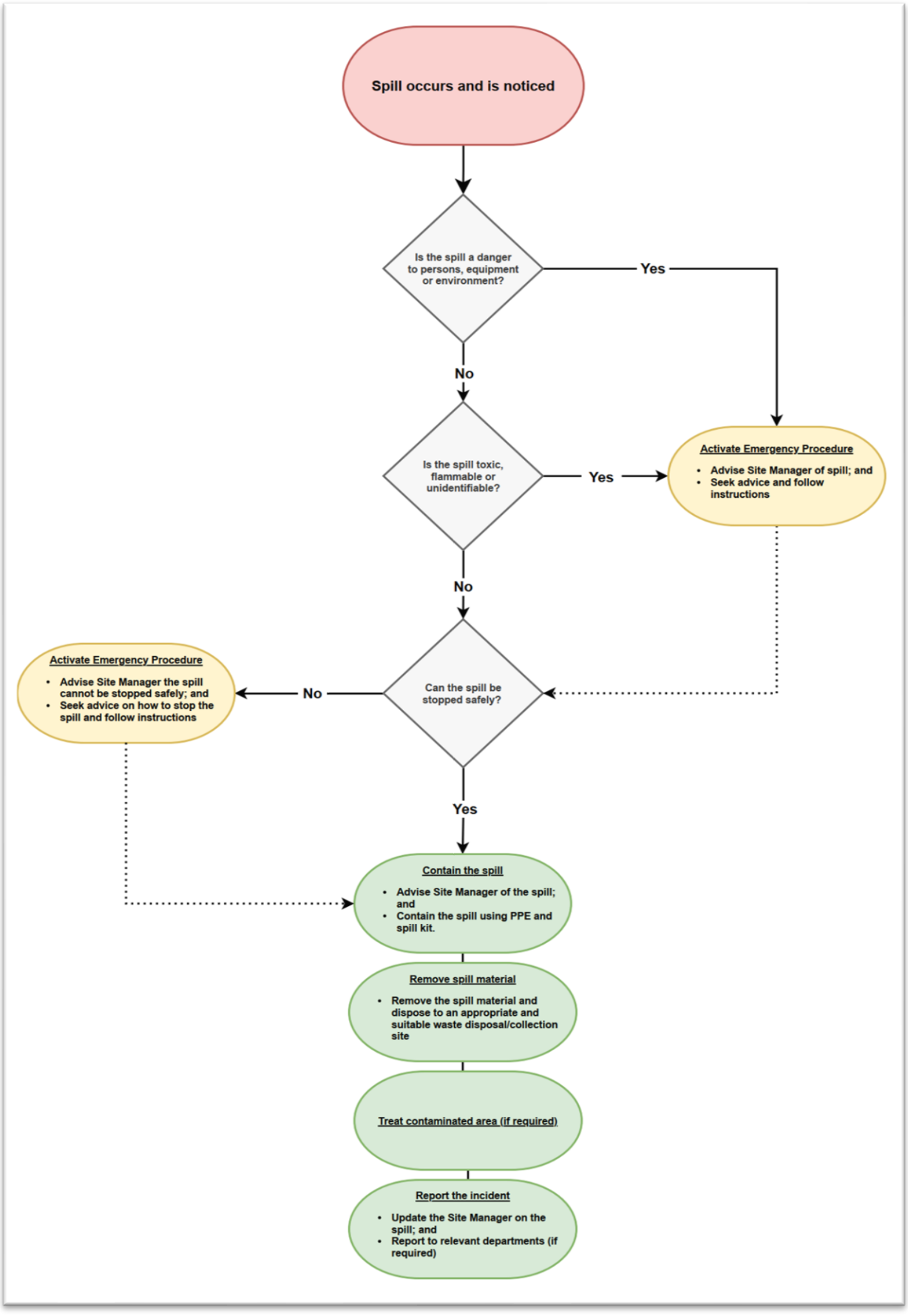


Figure 9: Spill response procedure flow chart

8.7 Heavy Rain

The site is not within a flood hazard area however, in the event of heavy rainfall, there is a risk for uncontrolled release of contaminated water off site. The risk of uncontrolled releases at the site will be reduced by the following measures:

- keep the site in a clean and tidy state at all times;
- plant and equipment stored on site will be housed in appropriate storage facilities and maintained per manufacturer specifications;
- monitor weather forecasting for periods of heavy rainfall and prepare the site accordingly;
- implement and maintain erosion controls and ensure they are operating to design capacities; and
- any spills and/or leaks at the site shall be cleaned up immediately or as soon as it is notice (**Section 8.6**; **Figure 9**) to prevent runoff contamination.

8.8 Trespassers

All persons coming on site must be authorised by the Site Manager.

All visitors to the site must report to the site office upon arrival.

Any unauthorised entry to the site shall be referred to local police authorities as soon as possible.

The site shall have sufficient fencing and/or barriers in place to deter trespassing and any other unauthorised access.

9 INSPECTIONS AND MONITORING

9.1 Site Inspections

The Site Manager shall undertake weekly inspections of the site and mining operations. The purpose of site inspections is to identify if any maintenance is required and/or if there are any deficiencies in rehabilitation areas, environmental controls, and/or the standard of environmental performance that requires attention.

9.2 Environmental Monitoring

Where environmental monitoring is required, all sampling and monitoring activities shall be completed by a competent person(s) and monitoring results shall be recorded, compiled and kept for a minimum of five (5) years. Monitoring results shall be made available to the administering authority upon request.

Equipment used for environmental monitoring shall be fit for purpose and maintained, operated and calibrated in accordance with manufacturer specifications.

Where the analysis of environmental samples is required, collected samples will be submitted for analysis to a NATA accredited laboratory (or other facility with an equivalent accreditation).

10 TRAINING, RECORDS AND REPORTING

10.1 Training

All personnel (staff and contractors) at the site shall complete a site induction to ensure they are aware of their responsibilities and are competent to carry out works at the site. At a minimum, site induction shall include:

- General Environmental Duty;
- Duty to Notify Environmental Harm;
- requirements of the Site Based Management Plan;
- environmental complaint, hazard, and incident management and reporting; and
- emergency response procedures.

Attendance at inductions shall be recorded on an Induction Registers Log and kept in the site office and made available upon appropriate request by the relevant administering authority and/or governing body.

10.2 Records Management

The Site Manager shall be responsible for managing environmental records in accordance with legislative requirements, and project specific approvals and permits. All environmental records shall be retained for no less than five (5) years and be made available upon request by regulatory authorities and in the specified format and required timeframe. Examples of records requested may include, but is not limited to, the following:

- site observations and site diary entries;
- complaints log;
- induction register;
- incidents and incident investigations;
- results of environmental monitoring;
- correspondence notes with regulatory authorities (or any other party);
- waste disposal records and receipts; and
- site emergencies.

10.3 Mine Record

A Mine Record will be maintained by the SSE and be kept in the Site Office. The purpose of the Mine Record is to ensure accurate record keeping of events occurring on site. The following information shall be documented in the Mine Record:

- incidents, accidents and near misses;
- contact with consultants, administering authorities, and governing bodies;
- toolbox and safety meetings;
- training provided;

- site visitors;
- site inspections and audits (including environmental audits); and
- high and medium risk activities and/or items.

As required, the SSE may record other information not listed as required and/or as appropriate.

10.4 Annual Fee & Return

An annual fee and annual return for the Environmental Authority shall be submitted by the Site Manager or other suitable representative (e.g. external consultant) to the administering authority by the anniversary date of the Environmental Authority, each year.

11 REVIEW & IMPROVEMENT

11.1 Non-Conformance and Corrective Actions

Non-conformance will be classified as any failure to comply with the requirements of this SBMP, regulatory requirements and conditions of approval and permits. Non-conformances may be identified through monitoring, inspections and/or incident investigations.

Non-conforming activities shall be stopped by any person at the site in consultation with the Site Manager. The activity will not recommence until an appropriate correction action has been implemented. A corrective action will be identified and implemented for each non-conformance.

Any breach of the conditions of the site Environmental Authority must be reported by the Site Manager to the administering authority within 24 hours of becoming aware of the breach. Records of breached conditions must be kept and include details of the breach, notifications made to the administering authority and document corrective actions taken.

11.2 Environmental Performance

Performance of environmental management shall be reviewed annually and as part of the continual improvement process of the site. Additional reviews may occur in response to matters that affect environmental management, for example:

- incidents;
- emergencies;
- changes in site conditions and operations;
- changes to permit conditions; or
- changes in legislation.

The annual environmental management review shall be conducted by the Site Manager, appropriately qualified staff personnel, and/or external consultants. The review shall consider:

- monitoring and inspection results of the past year;
- recent and relevant incidents and lessons learned;
- complaint management;
- feedback from regulatory authorities;
- tabling of any new legal or other obligations;
- effectiveness of environmental controls; and
- adequacy of resources for environmental management.

11.3 Update and Review

This SBMP shall, at a minimum, be reviewed annually by the Site Manager to determine if management measures document remain appropriate for mining operations and site conditions. Other triggers to initiate a review and potential update of the SBMP outside of the annual review cycle include, but are not limited to:

- following the issue of project approvals and/or permits;
- following an incident that causes environmental harm;
- following changes to applicable legislation or project approvals; or
- following changes to operational methods and/or site conditions that require additional and/or alternative environmental controls to manage risks to environmental values.

REFERENCES

Campbell Higginson Town Planning. (2006). Taroom Shire Planning Scheme

DES. (2023). Guideline – Duty to notify of environmental harm (ESR/2016/2271) Version 4. Department of Environment and Science, Queensland Government.

DNRM. (2019). Queensland mining industry incident report manual – Instructions for completion of on-line incident report and monthly summary. Department of Natural Resources, Mines and Energy, Queensland Government.

Maranoa Regional Council. (2017). Maranoa Planning Scheme 2017 Version 5.

Queensland Government. (2022). Research brief – topsoil deficits affecting mine rehabilitation in Queensland. Office of the Queensland Mine Rehabilitation Commissioner, State of Queensland.

Queensland Government. (2023). Queensland Globe. https://qldglobe.information.qld.gov.au/

Western Downs Regional Council. (2019). Western Downs Planning Scheme 2017 (Amendment 1).

APPENDICES

Appendix 1 Site Layout Plans

Appendix 2 Safety Data Sheets

Appendix 3 Traffic Plan

Appendix 4 Waste Management Plan

Appendix 5 Bushfire Management Plan

Appendix 6 Site Water Management and Monitoring Plan

Appendix 7 Final Land Use and Rehabilitation Plan

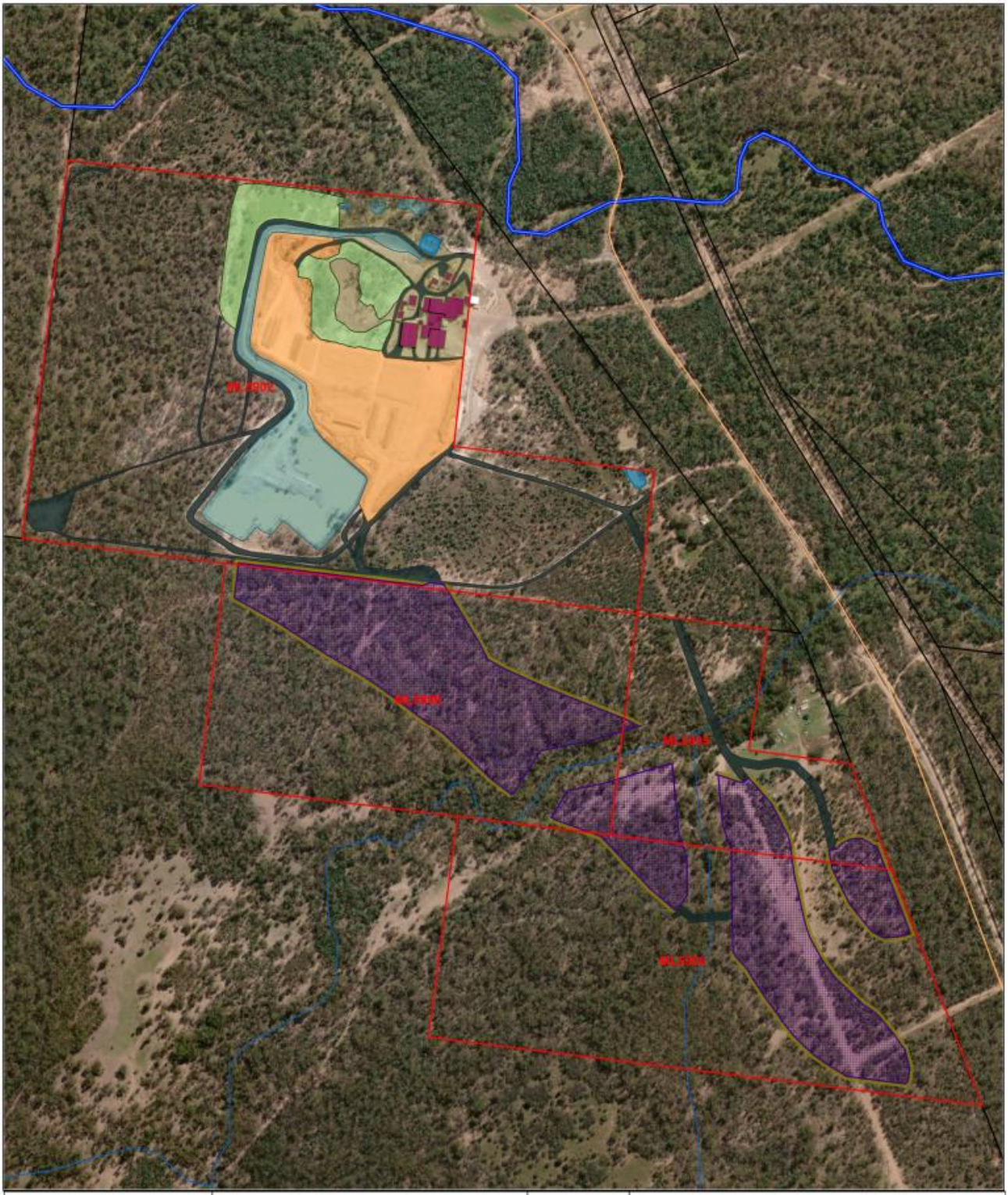
Appendix 8 Complaint Log

Appendix 9 Risk Assessment Matrix

Appendix 10 Guideline – Duty to notify of environmental harm

Appendix 1

Site Layout Plans



AUSROCKS RESOURCE CONSULTANTS

0 m 100 m 200 m 300 m 400 m

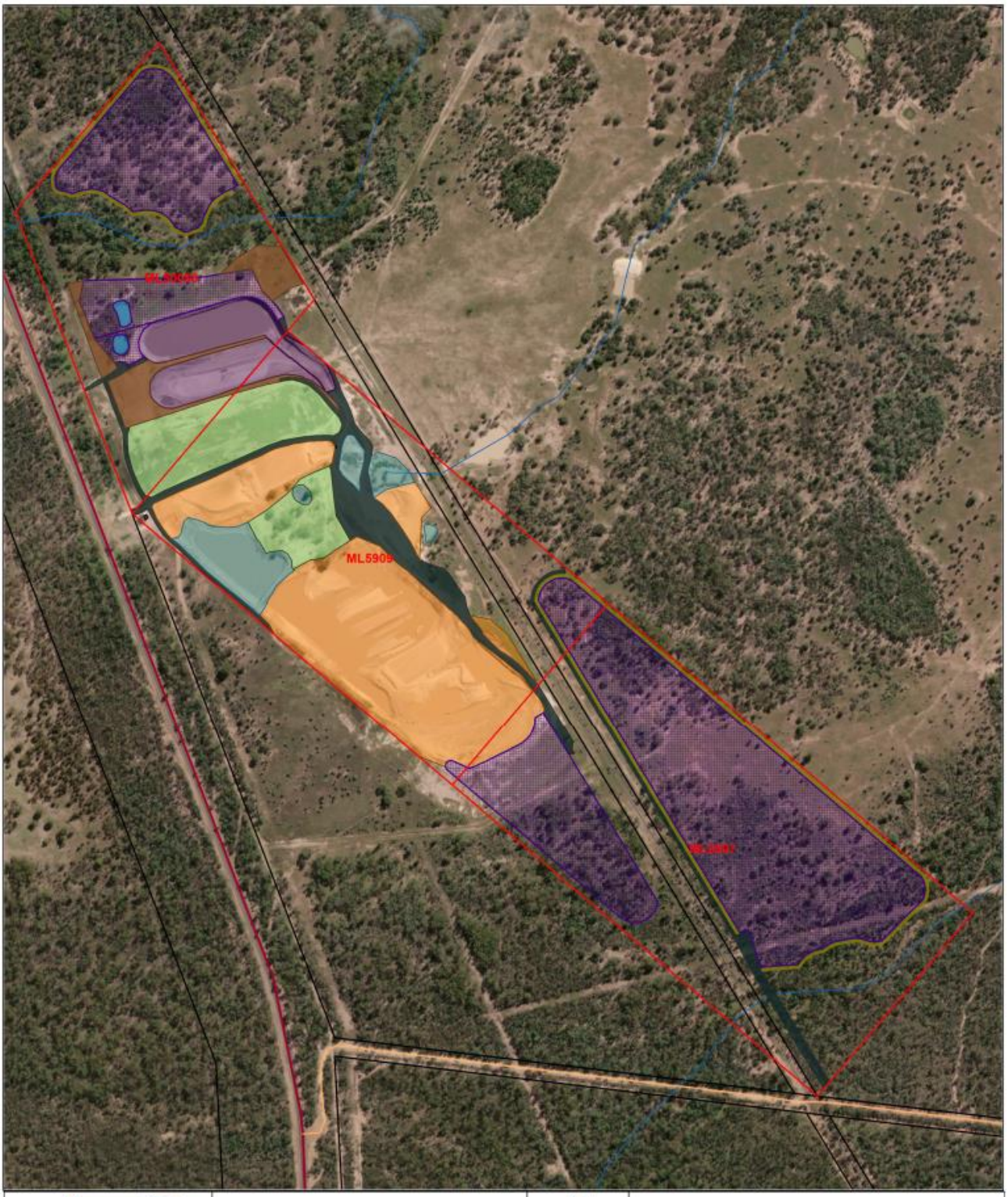
N

Ausrocks Pty Ltd
PO Box 359
Virginia BC
QLD 4014
(07) 3161 4108
www.ausrocks.com.au
64 056 939 014

Legend

- Bund
- Cadastral Boundary
- Infastructure
- Laydown Yard
- Mining Lease Boundary
- Pit Area (Proposed/Planned)
- Rehabilitation Area (in progress)
- Road
- ROM Pad
- Sediment Dams
- Water Storage
- Creek
- Local Road
- Watercourse

Title: **Terrequip Miles Bentonite Mine Primary Mine Features - Gurulmundi Leases**		Project No.	AUQ00238F
		Drawing No.	MIL003
Scale: 1:6,500	Datum: GDA2020	Date	19/01/2024
Drawn: RM	Checked: CM	Status	1.2



AUSROCKS RESOURCE CONSULTANTS

50 m 150 m 250 m 350 m

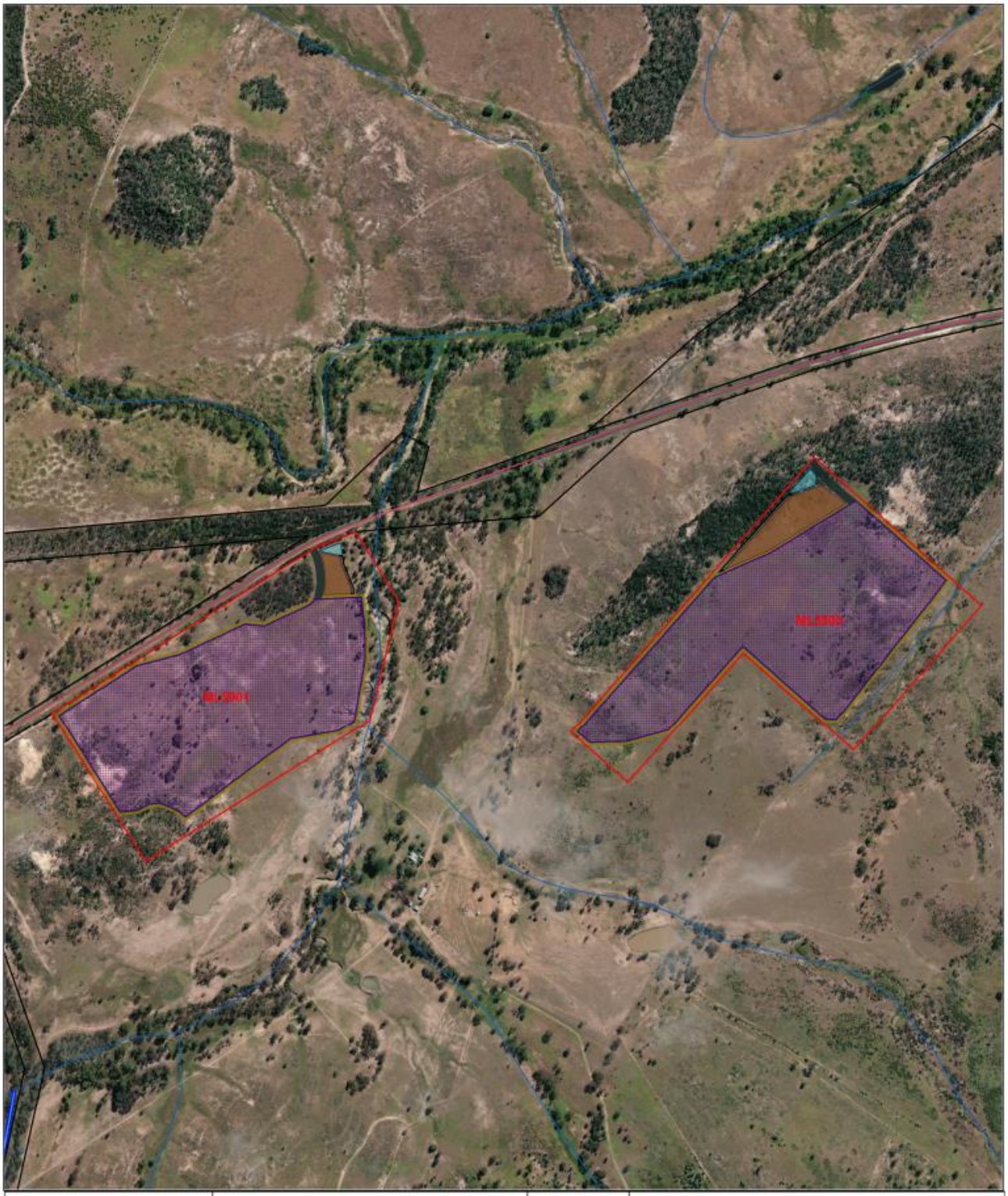
N

Ausrocks Pty Ltd
PO Box 359
Virginia BC
QLD 4014
(07) 3161 4108
www.ausrocks.com.au
64 056 939 014

Legend

- Bund
- Cadastral Boundary
- Infastructure
- Mining Lease Boundary
- Pit Area
- Pit Area (Proposed/Planned)
- Rehabilitation Area (in progress)
- Road
- ROM Pad
- Sediment Dams
- Topsoil Stockpile
- Water Storage
- Highway
- Local Road
- Watercourse

Title: Terrequip Miles Bentonite Mine Primary Mine Features - Ausben Leases		Project No.	AUQ00238F
		Drawing No.	MIL004
Scale: 1:6,000	Datum: GDA2020	Date	18/01/2024
Drawn: RM	Checked: CM	Status	1.2



AUSROCKS RESOURCE CONSULTANTS

50 m 150 m 300 m 450 m

N

Legend

- Basin
- Bund
- Cadastral Boundary
- Drain
- Mining Lease Boundary
- Pit Area (Proposed/Planned)
- Road
- Topsoil Stockpile
- Creek
- Secondary Road
- Watercourse

Ausrocks Pty Ltd
PO Box 359
Virginia BC
QLD 4014
(07) 3161 4108
www.ausrocks.com.au
64 056 939 014

Title	Terrequip Miles Bentonite Mine Primary Mine Features - Woleebee Leases (planned disturbance)	Project No.	AUQ00238F
		Drawing No.	MIL005
Scale	1:7,500	Datum	GDA2020
Date	18/01/2024		
Drawn	RM	Checked	CM
Status	1.2		

Appendix 2

Safety Data Sheets

Safety Data Sheet

SECTION 1 IDENTIFICATION

Diesel, Diesel with Techron D

Product Use: Fuel
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
- Flammable liquid: Category 4.
- Acute inhalation toxicant: Category 4.
- Aspiration toxicant: Category 1.
- Carcinogen: Category 1B.
- Skin irritation: Category 2.
- Target organ toxicant (central nervous system): Category 3.
- Target organ toxicant (repeated exposure): Category 2.
- Acute aquatic toxicant: Category 2.
- Chronic aquatic toxicant: Category 2.

Signal Word: Danger
Physical Hazards:
- Combustible liquid (H227).

Health Hazards:
- May be fatal if swallowed and enters airways (H304).
- Causes skin irritation (H315).
- Harmful if inhaled (H332).
- May cause drowsiness or dizziness (H336).
- May cause cancer (H350).

• May cause damage to organs (Blood/Blood Forming Organs, Liver, Thymus) through prolonged or repeated exposure (H373).

Environmental Hazards:
• Toxic to aquatic life with long lasting effects (H411).

PRECAUTIONARY STATEMENTS:
General:
• Keep out of reach of children (P102).
• Read carefully and follow all instructions (P103).
Prevention:
• Obtain special instructions before use (P201).
• Do not handle until all safety precautions have been read and understood (P202).
• Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking (P210).
• Do not breathe dust/fume/gas/mist/vapours/spray (P260).
• Wash thoroughly after handling (P264).
• Use only outdoors or in a well-ventilated area (P271).
• Avoid release to the environment (P273).
• Wear protective gloves/protective clothing/eye protection/face protection (P280).
Response:
• IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician (P301+P310).
• IF ON SKIN: Wash with plenty of soap and water (P302+P352).
• IF INHALED: Remove person to fresh air and keep comfortable for breathing (P304+P340).
• IF exposed or concerned: Get medical advice/attention (P308+P313).
• Specific treatment (see Notes to Physician on this label) (P321).
• Do NOT induce vomiting (P331).
• If skin irritation occurs: Get medical advice/attention (P332+P313).
• Wash contaminated clothing before reuse (P363).
• In case of fire: Use media specified in the SDS to extinguish (P370+P378).
• Collect spillage (P391).
Storage:
• Store in a well-ventilated place. Keep container tightly closed (P403+P233).
• Store locked up (P405).
Disposal:
• Dispose of contents/container in accordance with applicable local/regional/national/international regulations (P501).

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Gas oils	68334-30-5	100 %weight
Distillates, straight run middle (gas oil, light) - Straight Run GO Category	64741-44-2	0 - 99 %weight
Distillates, hydrodesulfurized, middle - Other Gas Oil Category	64742-80-9	0 - 99 %weight
Naphthalene	91-20-3	0.02 - 0.2 %weight
Total sulfur	Mixture	0.001 %weight

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response.
Ingestion: Highly toxic; may be fatal if swallowed. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Inhalation: Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:
Cancer: Prolonged or repeated exposure to this material may cause cancer. Whole diesel engine exhaust has been classified as a Group 2A carcinogen (probably carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Target Organs: Contains material that may cause damage to the following organ(s) following repeated skin contact based on animal data: Liver Blood/Blood Forming Organs ThymusSee Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: None Allocated

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
Unusual Fire Hazards: See Section 7 for proper handling and storage.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches.
Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Unusual Handling Hazards: WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death. Slow heat generation may occur with oil-soaked rags, spent filter aids and spent absorbent material and may cause spontaneous combustion if stored near combustibles and not handled properly. Store biodiesel soaked rags, filter aids, and spill absorbent material in approved safety disposal containers and dispose of properly. Biodiesel soaked rags may be washed with soap and water and allowed to dry in well ventilated area.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The

user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Polyvinyl Alcohol (PVA) (Note: Avoid contact with water. PVA deteriorates in water.), Viton.
Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors. When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Gas oils	ACGIH	Inhalable fraction and vapor	100 mg/m3	--	--	Skin total hydrocarbon
Gas oils	CVX	Vapor and aerosol	100 mg/m3	--	--	Skin A3
Distillates, hydrodesulfurized, middle - Other Gas Oil Category	ACGIH	Inhalable fraction	5 mg/m3	--	--	--
Distillates, hydrodesulfurized, middle - Other Gas Oil Category	Australia Workplace	--	480 mg/m3	--	--	--
Naphthalene	ACGIH	Vapor	10 ppm	15 ppm	--	A4 Skin
Naphthalene	ACGIH	--	10 ppm	--	--	Skin
Naphthalene	Australia Workplace	--	52 mg/m3	79 mg/m3	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Varies depending on specification
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: No data available

Vapor Density (Air = 1): No data available
Initial Boiling Point: No data available
Solubility: Soluble in hydrocarbon solvents; insoluble in water.
Freezing Point: Not Applicable
Melting Point: No data available
Specific Gravity: 0.82 - 0.85 @ 15°C (59°F)
Density: 0.82 kg/l - 0.85 kg/l @ 15°C (59°F)
Viscosity: 2 cSt - 4 cSt @ 40°C (104°F)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: >= 62 °C (>= 143 °F) (Minimum)
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data available

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The material is not considered an eye irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: This material causes skin irritation. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for similar materials.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials.

Acute Inhalation Toxicity: This material is harmful if inhaled. The product has not been tested. The statement is based on evaluation of data for similar materials.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: Refer to ADDITIONAL TOXICOLOGY INFORMATION below.

Reproductive Toxicity: The material is not considered a reproductive toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: This material may cause drowsiness or dizziness. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: This material may cause damage to organs through prolonged or repeated exposure. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: This material is considered an aspiration hazard based on the kinematic viscosity of the material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains gas oils.
CONCAWE (product dossier 95/107) has summarized current health, safety and environmental data available for a number of gas oils, typically hydrodesulfurized middle distillates, CAS 64742-80-9, straight-run middle distillates, CAS 64741-44-2, and/or light cat-cracked distillate CAS 64741-59-9.
CARCINOGENICITY: All materials tested have caused the development of skin tumors in mice, but all featured severe skin irritation and sometimes a long latency period before tumors developed. Straight-run and cracked gas oil samples were studied to determine the influence of dermal irritation on the carcinogenic activity of middle distillates. At non-irritant doses the straight-run gas oil was not carcinogenic, but at irritant doses, weak activity was demonstrated. Cracked gas oils, when diluted with mineral oil, demonstrated carcinogenic activity irrespective of the occurrence of skin irritation. Gas oils were tested on male mice to study tumor initiating/promoting activity. The results demonstrated that while a straight-run gas oil sample was neither an initiator or promotor, a blend of straight-run and FCC stock was both a tumor initiator and a promoter.
GENOTOXICITY: Hydrotreated & hydrodesulfurized gas oils range in activity from inactive to weakly positive in in-vitro bacterial mutagenicity assays. Mouse lymphoma assays on straight-run gas oils without subsequent hydrodesulphurization gave positive results in the presence of S9 metabolic activation. In-vivo bone marrow cytogenetics and sister chromatic exchange assay exhibited no activity for straight-run components with or without hydrodesulphurization. Thermally or catalytically cracked gas oils tested with in-vitro bacterial mutagenicity assays in the presence of S9 metabolic activation were shown to be mutagenic. In-vitro sister chromatic exchange assays on cracked gas oil gave equivocal results both with and without S9 metabolic activation. In-vivo bone marrow cytogenetics assay was inactive for two cracked gas oil samples. Three hydrocracked gas oils were tested with in-vitro bacterial mutagenicity assays with S9, and one of the three gave positive results. Twelve distillate fuel samples were tested with in-vitro bacterial mutagenicity assays & with S9 metabolic activation and showed negative to weakly positive results. In one series, activity was shown to be related to the PCA content of samples tested. Two in-vivo studies were also conducted. A mouse dominant lethal assay was negative for a sample of diesel fuel. In the other study, 9 samples of No 2 heating oil containing 50% cracked stocks caused a slight increase in the number of chromosomal aberrations in bone marrow cytogenetics assays. DEVELOPMENTAL TOXICITY: Diesel fuel vapor did not cause fetotoxic or teratogenic effects when pregnant rats were exposed on days 6-15 of pregnancy. Gas oils were applied to the skin of pregnant rats daily on days 0-19 of gestation. All but one (coker light gas oil) caused fetotoxicity (increased resorptions, reduced litter weight, reduced litter size) at dose levels that were also maternally toxic.

The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel

exhaust be regarded as potentially causing cancer. This recommendation was based on test results showing increased lung cancer in laboratory animals exposed to whole diesel exhaust.

This product may contain significant amounts of Polynuclear Aromatic Hydrocarbons (PAH's) which have been shown to cause skin cancer after prolonged and frequent contact with the skin of test animals. Brief or intermittent skin contact with this product is not expected to have serious effects if it is washed from the skin. While skin cancer is unlikely to occur in human beings following use of this product, skin contact and breathing, of mists, vapors or dusts should be reduced to a minimum.

This product contains naphthalene.
GENERAL TOXICITY: Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts. REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. GENETIC TOXICITY: Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro tests.CARCINOGENICITY: In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30, and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. On release to the environment the lighter components of diesel fuel will generally evaporate but depending on local environmental conditions (temperature, wind, mixing or wave action, soil type, etc.) the remainder may become dispersed in the water column or absorbed to soil or sediment. Diesel fuel would not be expected to be readily biodegradable. In a modified Strum test (OECD method 301B) approximately 40% biodegradation was recorded over 28 days. However, it has been shown that most hydrocarbon components of diesel fuel are degraded in soil in the presence of oxygen. Under anaerobic conditions, such as in anoxic sediments, rates of biodegradation are negligible.
The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE

Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: None Allocated

ADG/ADOT Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR ROAD OR RAIL TRANSPORT UNDER THE ADG CODE

IMO/IMDG Shipping Description:UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (DIESEL FUEL), 9, III, MARINE POLLUTANT (DIESEL FUEL); PACKAGES CONTAINING LESS THAN 5 LITERS IN ONE PACKAGING MAY BE EXEMPT FROM REGULATION.

ICAO/IATA Shipping Description:UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (DIESEL FUEL), 9, III; PACKAGES CONTAINING LESS THAN 5 LITERS IN ONE PACKAGING MAY BE EXEMPT FROM REGULATION.

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5
02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6
02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7
02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10
02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E
02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F
02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J
02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

The following components of this material are found on the regulatory lists indicated.
Distillates, hydrodesulfurized, middle - Other Gas 02-5, 02-E, 02-S
Oil Category
Naphthalene 02-10, 02-6, 02-E, 02-F

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL

(Canada), EINECS (European Union), IECSC (China), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 01 - Product Identifier information was modified.

Review Date: January 28, 2022

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Safety Data Sheet

SECTION 1 IDENTIFICATION

Hydraulic Oil AW 46, 68

Product Use: Hydraulic Oil
Product Number(s): 520311, 520312
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
Not classified as hazardous according to the Globally Harmonised System of Classification and Labeling of Chemicals as implemented under the WHS Regulations.

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 99 %weight

Note that the remaining composition contains nonhazardous ingredients or hazardous ingredients below the relevant threshold up to 100%.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: None Allocated

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
Unusual Fire Hazards: Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, refer to PPE information below.

Factors that affect PPE include, but are not limited to: properties of the chemical, other chemicals which may contact the same PPE, physical requirements (fit & sizing, cut/puncture protection, dexterity, thermal protection, etc.), and potential allergic reactions to the PPE material. It is the responsibility of the user to read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear chemical personal protective equipment (PPE) to prevent skin contact. Selection of chemical protective clothing should be performed by an Occupational Hygienist or Safety Professional and be based upon applicable standards (ASTM F739 or EN 374). Using chemical PPE depends upon operations conducted and may include chemical gloves, boots, chemical apron, chemical suit, and complete facial protection. Refer to PPE manufacturers to obtain breakthrough time information to determine how long PPE can be used before it needs to be replaced. Unless specific glove manufacturer data indicates otherwise, the below table is based upon available industry data to assist in the glove selection process and is intended to be used as reference only.

Chemical Glove Material	Thickness (mm)	Typical Breakthrough Time (minutes)
Butyl	0.7	120
Nitrile	0.8	240
Viton Butyl	0.3	240

Respiratory Protection: No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil

mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	--	5 mg/m3	10 mg/m3	--	--
Highly refined mineral oil (C15 - C50)	Australia	--	5 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown to yellow
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Initial Boiling Point: No data available
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Melting Point: No data available
Density: 0.87 kg/l - 0.88 kg/l @ 15°C (59°F) (Typical)
Viscosity: 29 mm2/s @ 40°C (104°F) (Minimum)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): Not Applicable

Flashpoint: (Cleveland Open Cup) 196 °C (385 °F) (Minimum)
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The material is not considered an eye irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: The material is not considered a skin irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The material is not considered an inhalation toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: The material is not considered a carcinogen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Reproductive Toxicity: The material is not considered a reproductive toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: The material is not considered a target organ toxicant (single exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: The material is not considered a target organ toxicant (repeated exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: The material is not considered an aspiration hazard.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).
These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from products of a similar structure and composition.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: None Allocated

ADG/ADOT Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR ROAD OR RAIL TRANSPORT UNDER THE ADG CODE

IMO/IMDG Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5
02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6
02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7
02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10

02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E

02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F

02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J

02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), ENCS (Japan), IECSC (China), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 01 - Product Identifier information was modified.
SECTION 08 - Eye/Face Protection information was modified.
SECTION 08 - General Considerations information was modified.
SECTION 08 - Personal Protective Equipment List information was deleted.
SECTION 08 - Personal Protective Equipment information was added.
SECTION 08 - Skin Protection information was modified.
SECTION 15 - Chemical Inventories information was modified.

Review Date: April 11, 2023

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Safety Data Sheet

SECTION 1 IDENTIFICATION

Delo 400 MGX SAE 15W-40

Product Use: Heavy Duty Motor Oil
Product Number(s): 219728, 500634
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
Not classified as hazardous according to the Globally Harmonised System of Classification and Labeling of Chemicals as implemented under the WHS Regulations.

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 99 %weight

Note that the remaining composition contains nonhazardous ingredients or hazardous ingredients below the relevant threshold up to 100%.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs. If exposure to hydrogen sulfide (H2S) gas is possible during an emergency, wear an approved,

positive pressure air-supplying respirator. Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.
Note to Physicians: Administration of 100% oxygen and supportive care is the preferred treatment for poisoning by hydrogen sulfide gas. For additional information on H2S, see Chevron SDS No. 301.

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing. Hydrogen sulfide has a strong rotten-egg odor. However, with continued exposure and at high levels, H2S may deaden a person's sense of smell. If the rotten egg odor is no longer noticeable, it may not necessarily mean that exposure has stopped. At low levels, hydrogen sulfide causes irritation of the eyes, nose, and throat. Moderate levels can cause headache, dizziness, nausea, and vomiting, as well as coughing and difficulty breathing. Higher levels can cause shock, convulsions, coma, and death. After a serious exposure, symptoms usually begin immediately.

The U.S. National Institute for Occupational Safety and Health (NIOSH) considers air concentrations of hydrogen sulfide gas greater than 100 ppm to be Immediately Dangerous to Life and Health (IDLH).

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: None Allocated

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Zinc, Phosphorus, Nitrogen, Sulfur.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: Do not breathe gas. Wash thoroughly after handling. Keep out of the reach of children.
Unusual Handling Hazards: Toxic quantities of hydrogen sulfide (H2S) may be present in storage tanks and bulk transport vessels which contain or have contained this material. Persons opening or entering these compartments should first determine if H2S is present. See Exposure Controls/Personal Protection -Section 8. Do not attempt rescue of a person over exposed to H2S without wearing approved supplied-air or self-contained breathing equipment. If there is a potential for exceeding one-half the occupational exposure standard, monitoring of hydrogen sulfide levels is required. Since the sense of smell cannot be relied upon to detect the presence of H2S, the concentration should be measured by the use of fixed or portable devices.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, refer to PPE information below.

Factors that affect PPE include, but are not limited to: properties of the chemical, other chemicals which may contact the same PPE, physical requirements (fit & sizing, cut/puncture protection, dexterity, thermal protection, etc.), and potential allergic reactions to the PPE material. It is the responsibility of the user to read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear chemical personal protective equipment (PPE) to prevent skin contact. Selection of chemical protective clothing should be performed by an Occupational Hygienist or Safety Professional and be based upon applicable standards (ASTM F739 or EN 374). Using chemical PPE depends upon operations conducted and may include chemical gloves, boots, chemical apron, chemical suit, and complete facial protection. Refer to PPE manufacturers to obtain breakthrough time information to determine how long PPE can be used before it needs to be replaced. Unless specific glove manufacturer data indicates otherwise, the below table is based upon available industry data to assist in the glove

selection process and is intended to be used as reference only.

Chemical Glove Material	Thickness (mm)	Typical Breakthrough Time (minutes)
Butyl	0.7	120
Nitrile	0.8	240
Viton Butyl	0.3	240

Respiratory Protection: No respiratory protection is normally required. If material is heated and emits hydrogen sulfide, determine if airborne concentrations are below the occupational exposure limit for hydrogen sulfide. If not, wear an approved positive pressure air-supplying respirator. For more information on hydrogen sulfide, see Chevron SDS No. 301. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	--	5 mg/m3	10 mg/m3	--	--
Highly refined mineral oil (C15 - C50)	Australia	--	5 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown to yellow
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Initial Boiling Point: No data available
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: No data available
Melting Point: No data available
Density: 0.8759 kg/l @ 15°C (59°F) (Typical)
Viscosity: 14.10 mm2/s - 15.10 mm2/s @ 100°C (212°F)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): Not Applicable

Flashpoint: (Cleveland Open Cup) 215 °C (419 °F) (Minimum)

Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: Hydrogen Sulfide (Elevated temperatures), Alkyl Mercaptans (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The material is not considered an eye irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: The material is not considered a skin irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The material is not considered an inhalation toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: The material is not considered a carcinogen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Reproductive Toxicity: The material is not considered a reproductive toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: The material is not considered a target organ toxicant (single exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: The material is not considered a target organ toxicant (repeated exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: The material is not considered an aspiration hazard.

ADDITIONAL TOXICOLOGY INFORMATION:
During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water.

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: None Allocated

ADG/ADOT Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR ROAD OR RAIL TRANSPORT UNDER THE ADG CODE

IMO/IMDG Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5
02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6
02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7
02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10
02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E
02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F
02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J
02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), ENCS (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States).

One or more components is listed on ELINCS (European Union). All other components are listed or exempted from listing on EINECS.

One or more components does not comply with the following chemical inventory requirements: IECSC (China).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 05 - HAZCHEM Code information was added.
SECTION 08 - Eye/Face Protection information was modified.
SECTION 08 - General Considerations information was modified.
SECTION 08 - Personal Protective Equipment List information was deleted.
SECTION 08 - Personal Protective Equipment information was added.
SECTION 08 - Skin Protection information was modified.
SECTION 11 - Toxicological Information information was modified.
SECTION 14 - ADOT Classification information was added.

Review Date: December 28, 2022

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit

	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Safety Data Sheet

SECTION 1 IDENTIFICATION

Gear Oil ZF SAE 80W-90

Product Use: Axle Oil
Product Number(s): 510310
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
Not classified as hazardous according to the Globally Harmonised System of Classification and Labeling of Chemicals as implemented under the WHS Regulations.

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 99 %weight

Note that the remaining composition contains nonhazardous ingredients or hazardous ingredients below the relevant threshold up to 100%.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs. If exposure to hydrogen sulfide (H2S) gas is possible during an emergency, wear an approved,

positive pressure air-supplying respirator. Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.
Note to Physicians: Administration of 100% oxygen and supportive care is the preferred treatment for poisoning by hydrogen sulfide gas. For additional information on H2S, see Chevron SDS No. 301.

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing. Hydrogen sulfide has a strong rotten-egg odor. However, with continued exposure and at high levels, H2S may deaden a person's sense of smell. If the rotten egg odor is no longer noticeable, it may not necessarily mean that exposure has stopped. At low levels, hydrogen sulfide causes irritation of the eyes, nose, and throat. Moderate levels can cause headache, dizziness, nausea, and vomiting, as well as coughing and difficulty breathing. Higher levels can cause shock, convulsions, coma, and death. After a serious exposure, symptoms usually begin immediately.

The U.S. National Institute for Occupational Safety and Health (NIOSH) considers air concentrations of hydrogen sulfide gas greater than 100 ppm to be Immediately Dangerous to Life and Health (IDLH).

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: None Allocated

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Phosphorus, Sulfur, Nitrogen.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: Do not breathe gas. Wash thoroughly after handling. Keep out of the reach of children.
Unusual Handling Hazards: Toxic quantities of hydrogen sulfide (H2S) may be present in storage tanks and bulk transport vessels which contain or have contained this material. Persons opening or entering these compartments should first determine if H2S is present. See Exposure Controls/Personal Protection -Section 8. Do not attempt rescue of a person over exposed to H2S without wearing approved supplied-air or self-contained breathing equipment. If there is a potential for exceeding one-half the occupational exposure standard, monitoring of hydrogen sulfide levels is required. Since the sense of smell cannot be relied upon to detect the presence of H2S, the concentration should be measured by the use of fixed or portable devices.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, refer to PPE information below.

Factors that affect PPE include, but are not limited to: properties of the chemical, other chemicals which may contact the same PPE, physical requirements (fit & sizing, cut/puncture protection, dexterity, thermal protection, etc.), and potential allergic reactions to the PPE material. It is the responsibility of the user to read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear chemical personal protective equipment (PPE) to prevent skin contact. Selection of chemical protective clothing should be performed by an Occupational Hygienist or Safety Professional and be based upon applicable standards (ASTM F739 or EN 374). Using chemical PPE depends upon operations conducted and may include chemical gloves, boots, chemical apron, chemical suit, and complete facial protection. Refer to PPE manufacturers to obtain breakthrough time information to determine how long PPE can be used before it needs to be replaced. Unless specific glove manufacturer data indicates otherwise, the below table is based upon available industry data to assist in the glove

selection process and is intended to be used as reference only.

Chemical Glove Material	Thickness (mm)	Typical Breakthrough Time (minutes)
Butyl	0.7	120
Nitrile	0.8	240
Viton Butyl	0.3	240

Respiratory Protection: No respiratory protection is normally required. If material is heated and emits hydrogen sulfide, determine if airborne concentrations are below the occupational exposure limit for hydrogen sulfide. If not, wear an approved positive pressure air-supplying respirator. For more information on hydrogen sulfide, see Chevron SDS No. 301. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	--	5 mg/m3	10 mg/m3	--	--
Highly refined mineral oil (C15 - C50)	Australia	--	5 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Brown to yellow
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Initial Boiling Point: No data available
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: No data available
Melting Point: No data available
Density: 0.9002 kg/l @ 15°C (59°F) (Typical)
Viscosity: 14 mm2/s @ 100°C (212°F) (Minimum)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): Not Applicable

Flashpoint: (Cleveland Open Cup) 165 °C (329 °F) (Minimum)

Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: Hydrogen Sulfide (Elevated temperatures), Alkyl Mercaptans (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The material is not considered an eye irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: The material is not considered a skin irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The material is not considered an inhalation toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: The material is not considered a carcinogen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Reproductive Toxicity: The material is not considered a reproductive toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: The material is not considered a target organ toxicant (single exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: The material is not considered a target organ toxicant (repeated exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: The material is not considered an aspiration hazard.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).
These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: None Allocated

ADG/ADOT Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR ROAD OR RAIL TRANSPORT UNDER THE ADG CODE

IMO/IMDG Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT

UNDER ICAO

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5
02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6
02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7
02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10
02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E
02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F
02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J
02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (United States).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 01 - Product Identifier information was modified.

Review Date: April 06, 2023

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control

and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Safety Data Sheet

SECTION 1 IDENTIFICATION

Havoline Fully Synthetic Manual Transmission Fluid SAE 75W-90

Product Use: Manual Transmission Fluid
Product Number(s): 510421
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
Not classified as hazardous according to the Globally Harmonised System of Classification and Labeling of Chemicals as implemented under the WHS Regulations.

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Distillates, hydrotreated heavy paraffinic	64742-54-7	70 - 99 %weight

Note that the remaining composition contains nonhazardous ingredients or hazardous ingredients below the relevant threshold up to 100%.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs. If exposure to hydrogen sulfide (H2S) gas is possible during an emergency, wear an approved,

positive pressure air-supplying respirator. Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.
Note to Physicians: Administration of 100% oxygen and supportive care is the preferred treatment for poisoning by hydrogen sulfide gas. For additional information on H2S, see Chevron SDS No. 301.

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a synthetic hydrocarbon oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing. Hydrogen sulfide has a strong rotten-egg odor. However, with continued exposure and at high levels, H2S may deaden a person's sense of smell. If the rotten egg odor is no longer noticeable, it may not necessarily mean that exposure has stopped. At low levels, hydrogen sulfide causes irritation of the eyes, nose, and throat. Moderate levels can cause headache, dizziness, nausea, and vomiting, as well as coughing and difficulty breathing. Higher levels can cause shock, convulsions, coma, and death. After a serious exposure, symptoms usually begin immediately.

The U.S. National Institute for Occupational Safety and Health (NIOSH) considers air concentrations of hydrogen sulfide gas greater than 100 ppm to be Immediately Dangerous to Life and Health (IDLH).

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: None Allocated

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Sulfur, Zinc, Phosphorus.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: Do not breathe gas. Wash thoroughly after handling.
Unusual Handling Hazards: Toxic quantities of hydrogen sulfide (H2S) may be present in storage tanks and bulk transport vessels which contain or have contained this material. Persons opening or entering these compartments should first determine if H2S is present. See Exposure Controls/Personal Protection -Section 8. Do not attempt rescue of a person over exposed to H2S without wearing approved supplied-air or self-contained breathing equipment. If there is a potential for exceeding one-half the occupational exposure standard, monitoring of hydrogen sulfide levels is required. Since the sense of smell cannot be relied upon to detect the presence of H2S, the concentration should be measured by the use of fixed or portable devices.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, refer to PPE information below.

Factors that affect PPE include, but are not limited to: properties of the chemical, other chemicals which may contact the same PPE, physical requirements (fit & sizing, cut/puncture protection, dexterity, thermal protection, etc.), and potential allergic reactions to the PPE material. It is the responsibility of the user to read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear chemical personal protective equipment (PPE) to prevent skin contact. Selection of chemical protective clothing should be performed by an Occupational Hygienist or Safety Professional and be based upon applicable standards (ASTM F739 or EN 374). Using chemical PPE depends upon operations conducted and may include chemical gloves, boots, chemical apron, chemical suit, and complete facial protection. Refer to PPE manufacturers to obtain breakthrough time information to determine how long PPE can be used before it needs to be replaced. Unless specific glove manufacturer data indicates otherwise, the below table is based upon available industry data to assist in

the glove selection process and is intended to be used as reference only.

Chemical Glove Material	Thickness (mm)	Typical Breakthrough Time (minutes)
Butyl	0.7	120
Nitrile	0.8	240
Viton Butyl	0.3	240

Respiratory Protection: No respiratory protection is normally required. If material is heated and emits hydrogen sulfide, determine if airborne concentrations are below the occupational exposure limit for hydrogen sulfide. If not, wear an approved positive pressure air-supplying respirator. For more information on hydrogen sulfide, see Chevron SDS No. 301. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Distillates, hydrotreated heavy paraffinic	ACGIH	Inhalable fraction	5 mg/m3	--	--	--
Distillates, hydrotreated heavy paraffinic	ACGIH	--	5 mg/m3	10 mg/m3	--	--
Distillates, hydrotreated heavy paraffinic	Australia Workplace	--	5 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Amber
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Initial Boiling Point: No data available
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: No data available
Melting Point: No data available
Density: 0.87 kg/l @ 15°C (59°F) (Typical)
Viscosity: 90.89 mm2/s @ 40°C (104°F) (Typical)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): Not Applicable

Flashpoint: (Cleveland Open Cup) 165 °C (329 °F) (Minimum)
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data available

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: Hydrogen Sulfide (Elevated temperatures), Alkyl Mercaptans (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The material is not considered an eye irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: The material is not considered a skin irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for product components.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The material is not considered an inhalation toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: The material is not considered a carcinogen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Reproductive Toxicity: The material is not considered a reproductive toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: The material is not considered a target organ toxicant (single exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: The material is not considered a target organ toxicant (repeated exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: The material is not considered an aspiration hazard.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: None Allocated

ADG/ADOT Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR ROAD OR RAIL TRANSPORT UNDER THE ADG CODE

IMO/IMDG Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B

02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5

02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6

02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7

02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10

02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E

02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F

02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J

02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

The following components of this material are found on the regulatory lists indicated.
Distillates, hydrotreated heavy paraffinic 02-5, 02-E, 02-S

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), ENCS (Japan), IECSC (China), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 08 - Eye/Face Protection information was modified.
SECTION 08 - General Considerations information was modified.
SECTION 08 - Occupational Exposure Limit Table information was modified.
SECTION 08 - Personal Protective Equipment List information was deleted.
SECTION 08 - Personal Protective Equipment information was added.
SECTION 08 - Skin Protection information was modified.
SECTION 14 - ADOT Classification information was modified.

Review Date: November 07, 2022

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the

results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Safety Data Sheet

SECTION 1 IDENTIFICATION

Gasolines (Ron 91, 95, 98), Premium 98 with Techron, Premium 95 with Techron, Unleaded 91 with Techron

Product Use: Fuel
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
- Flammable liquid: Category 2.
- Aspiration toxicant: Category 1.
- Carcinogen: Category 2.
- Reproductive toxicant (developmental): Category 2.
- Skin irritation: Category 2.
- Target organ toxicant (central nervous system): Category 3.
- Acute aquatic toxicant: Category 2.
- Chronic aquatic toxicant: Category 2.

Signal Word: Danger
Physical Hazards:
- Highly flammable liquid and vapour (H225).

Health Hazards:
- May be fatal if swallowed and enters airways (H304).
- Causes skin irritation (H315).
- May cause drowsiness or dizziness (H336).
- Suspected of causing cancer (H351).
- Suspected of damaging the unborn child (H361D).

Environmental Hazards:
- Toxic to aquatic life with long lasting effects (H411).

PRECAUTIONARY STATEMENTS:
General:
- Keep out of reach of children (P102).
- Read carefully and follow all instructions (P103).

Prevention:
- Obtain special instructions before use (P201).
- Do not handle until all safety precautions have been read and understood (P202).
- Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking (P210).
- Keep container tightly closed (P233).
- Ground and bond container and receiving equipment (P240).
- Use explosion-proof electrical/ventilating/lighting/equipment (P241).
- Use non-sparking tools (P242).
- Take action to prevent static discharge (P243).
- Avoid breathing dust/fume/gas/mist/vapours/spray (P261).
- Wash thoroughly after handling (P264).
- Use only outdoors or in a well-ventilated area (P271).
- Avoid release to the environment (P273).
- Wear protective gloves/protective clothing/eye protection/face protection (P280).

Response:
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician (P301+P310).
- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower (P303+P361+P353).
- IF INHALED: Remove person to fresh air and keep comfortable for breathing (P304+P340).
- IF exposed or concerned: Get medical advice/attention (P308+P313).
- Specific treatment (see Notes to Physician on this label) (P321).
- Do NOT induce vomiting (P331).
- If skin irritation occurs: Get medical advice/attention (P332+P313).
- Wash contaminated clothing before reuse (P363).
- In case of fire: Use media specified in the SDS to extinguish (P370+P378).
- Collect spillage (P391).

Storage:
- Store in a well-ventilated place. Keep container tightly closed (P403+P233).
- Store in a well-ventilated place. Keep cool (P403+P235).
- Store locked up (P405).

Disposal:
- Dispose of contents/container in accordance with applicable local/regional/national/international regulations (P501).

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Gasoline	86290-81-5	100 %volume
Toluene	108-88-3	0 - 15 %volume
Xylene	1330-20-7	0 - 15 %volume
Hexane	110-54-3	0 - 5 %volume
Ethylbenzene	100-41-4	0.1 - 3 %volume

N-methylaniline (NMA)	100-61-8	0 - 2.5 %volume
Naphthalene	91-20-3	0.1 - 1 %volume
Benzene	71-43-2	0.1 - 1 %volume
Methyl tert-butyl ether	1634-04-4	0.1 - 1 %volume

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response.
Ingestion: Highly toxic; may be fatal if swallowed. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Inhalation: Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:
Reproduction and Birth Defects: Contains material that may cause harm to the unborn child based on animal data.
Cancer: Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: 3YE

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
Unusual Fire Hazards: See Section 7 for proper handling and storage.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Never siphon gasoline by mouth.
Do not store in open or unlabeled containers. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Static Hazard: Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use

appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.
Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors. When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Gasoline	ACGIH	Vapor	300 ppm	500 ppm	--	A3
Gasoline	ACGIH	--	300 ppm	500 ppm	--	--
Toluene	ACGIH	--	20 ppm	--	--	--
Toluene	Australia Workplace	--	191 mg/m3	574 mg/m3	--	Skin
Xylene	ACGIH	--	100 ppm	150 ppm	--	--
Xylene	Australia Workplace	--	350 mg/m3	655 mg/m3	--	--
Hexane	ACGIH	--	50 ppm	--	--	Skin
Hexane	Australia	--	72 mg/m3	--	--	--

	Workplace					
Ethylbenzene	ACGIH	Vapor	100 ppm	--	--	--
Ethylbenzene	ACGIH	--	20 ppm	--	--	--
Ethylbenzene	Australia Workplace	--	434 mg/m3	543 mg/m3	--	--
N-methylaniline (NMA)	ACGIH	--	0.50 ppm	--	--	Skin
N-methylaniline (NMA)	Australia Workplace	--	2.20 mg/m3	--	--	Skin
Naphthalene	ACGIH	Vapor	10 ppm	15 ppm	--	A4 Skin
Naphthalene	ACGIH	--	10 ppm	--	--	Skin
Naphthalene	Australia Workplace	--	52 mg/m3	79 mg/m3	--	--
Benzene	ACGIH	Vapor	0.50 ppm	2.50 ppm	--	--
Benzene	ACGIH	--	0.50 ppm	2.50 ppm	--	Skin
Benzene	Australia Workplace	--	3.20 mg/m3	--	--	--
Benzene	CVX	Vapor	0.50 ppm	2.50 ppm	--	--
Methyl tert-butyl ether	ACGIH	Vapor	50 ppm	--	--	--
Methyl tert-butyl ether	ACGIH	--	50 ppm	--	--	--
Methyl tert-butyl ether	Australia Workplace	--	92 mg/m3	275 mg/m3	--	--
Methyl tert-butyl ether	CVX	--	--	50 ppm	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Varies depending on specification
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: No data available
Vapor Pressure: 54.80 kPa @ 37.8 °C (100 °F)
Vapor Density (Air = 1): 3 - 4 (Typical)
Initial Boiling Point: 37.8°C (100°F) - 204.4°C (399.9°F) (Typical)
Solubility: Insoluble in water; miscible with most organic solvents.
Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.72 - 0.75 @ 15°C (59°F)
Density: 724.7 kg/m3 @ 15°C (59°F)
Viscosity: <1 SUS @ 37.8°C (100°F)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: (Tagliabue Closed Cup ASTM D56) < -45 °C (< -49 °F)
Autoignition: > 280 °C (> 536 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: 1.4 Upper: 7.6

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The material is not considered an eye irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: This material causes skin irritation. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for similar materials.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials.

Acute Inhalation Toxicity: The material is not considered an inhalation toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials.

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: Refer to ADDITIONAL TOXICOLOGY INFORMATION below.

Reproductive Toxicity: This material is suspected of damaging the unborn child. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: This material may cause drowsiness or dizziness. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: The material is not considered a target organ toxicant (repeated exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: This material is considered an aspiration hazard based on the kinematic viscosity of the material.

ADDITIONAL TOXICOLOGY INFORMATION:
Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor

components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2/3, 8 and 15 of this MSDS. More detailed information on the health hazards of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).

Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice and kidney cancer in male rats. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene. The actual evidence for carcinogenicity in humans was considered inadequate.

MUTAGENICITY: Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chomosomal aberrations in their bone marrow cells. EPIDEMIOLOGY: To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

This product contains naphthalene.
GENERAL TOXICITY: Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts. REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. GENETIC TOXICITY: Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro

tests.CARCINOGENICITY: In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30, and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day.

This product contains benzene.
GENETIC TOXICITY/CANCER: Repeated or prolonged breathing of benzene vapor has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. In some individuals, benzene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation.
REPRODUCTIVE/DEVELOPMENTAL TOXICITY: No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother. However, some evidence of fetal toxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta.
OCCUPATIONAL: The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product.

This product contains n-hexane.
TARGET ORGAN TOXICITY: Prolonged or repeated ingestion, skin contact or breathing of vapors of n-hexane has been shown to cause peripheral neuropathy. Recovery ranges from no recovery to complete recovery depending upon the severity of the nerve damage. Exposure to 1000 ppm n-hexane for 18 hr/day for 61 days has been shown to cause testicular damage in rats. However, when rats were exposed to higher concentrations for shorter daily periods (10,000 ppm for 6 h/day, 5 days/wk for 13 weeks), no testicular lesions were seen.
CARCINOGENICITY: Chronic exposure to commercial hexane (52% n-hexane) at a concentration of 9000ppm was not carcinogenic to rats or to male mice, but did result in an increased incidence of liver tumors in female mice. No carcinogenic effects were observed in female mice exposed to 900 or 3000 ppm hexane or in male mice. The relevance for humans of these hexane-induced mouse liver tumors is questionable.
GENETIC TOXICITY: n-Hexane caused chromosome aberrations in bone marrow of rats, but was negative in the AMES and mouse lymphoma tests.

This product contains ethylbenzene.
BIRTH DEFECTS AND REPRODUCTION: Ethylbenzene is not expected to cause birth defects or other developmental effects based on well-conducted studies in rabbits and rats sponsored by NIOSH. Other studies in rats and mice which reported urinary tract malformations have many deficiencies and have limited usefulness in evaluating human risk. Reproductive effects are not expected based on a NIOSH study of fertility, and lack of effects observed for sperm counts and motility, estrous cycle and pathology of reproductive organs following repeated exposures. HEARING: Statistically significant losses in outer hair cells (OHCs) were observed in rats exposed to >=200 ppm ethylbenzene, 6 hours/day, 6 days/week for 13 weeks, after an 8-week recovery period. Following longer exposure, inner hair cells losses were also observed in rats exposed to >= 600 ppm ethylbenzene, but only occasionally in rats exposed to 400 ppm. The Lowest Observed Adverse Effect Level in rats (LOAEL) was 200 ppm for losses of OHCs. Guinea pigs exposed to ethylbenzene at 2,500 ppm, 6 hours/day for

5 days did not show auditory deficits or losses in OHCs. The concentration of ethylbenzene used in the JP-8 study was approximately 10 ppm. GENETIC TOXICITY: Ethylbenzene tested negative in the bacterial mutation test, Chinese Hamster Ovary (CHO) cell in vitro assay, sister chromatid exchange assay and an unscheduled DNA synthesis assay. Conflicting results have been reported for the mouse lymphoma cell assay. Increased micronuclei were reported in an in vitro Syrian hamster embryo cell assay; however, two in vivo micronuclei studies in mice were negative. In Syrian hamster embryo cells in vitro, cell transformation was observed at 7 days of incubation but not at 24 hours. Based on these results, ethylbenzene is not expected to be mutagenic or clastogenic. CARCINOGENICITY: In studies conducted by the National Toxicology Program, rats and mice were exposed to ethylbenzene at 25, 250 and 750 ppm for six hours per day, five days per week for 103 weeks. In rats exposed to 750 ppm, the incidence of kidney tubule hyperplasia and tumors was increased. Testicular tumors develop spontaneously in nearly all rats if allowed to complete their natural life span; in this study, the development of these tumors appeared to be enhanced in male rats exposed to 750 ppm. In mice, the incidences of lung tumors in males and liver tumors in females exposed to 750 ppm were increased as compared to control mice but were within the range of incidences observed historically in control mice. Other liver effects were observed in male mice exposed to 250 and 750 ppm. The incidences of hyperplasia were increased in the pituitary gland in female mice at 250 and 750 ppm and in the thyroid in male and female mice at 750 ppm.

This product contains toluene.
GENERAL TOXICITY: The primary effects of exposure to toluene in animals and humans are on the central nervous system. Solvent abusers, who typically inhale high concentrations (thousands of ppm) for brief periods of time, in addition to experiencing respiratory tract irritation, often suffer permanent central nervous system effects that include tremors, staggered gait, impaired speech, hearing and vision loss, and changes in brain tissue. Death in some solvent abusers has been attributed to cardiac arrhythmias, which appear to be have been triggered by epinephrine acting on solvent sensitized cardiac tissue. Although liver and kidney effects have been seen in some solvent abusers, results of animal testing with toluene do not support these as primary target organs.
HEARING: Humans who were occupationally exposed to concentrations of toluene as low as 100 ppm for long periods of time have experienced hearing deficits. Hearing loss, as demonstrated using behavioral and electrophysiological testing as well as by observation of structural damage to cochlear hair cells, occurred in experimental animals exposed to toluene. It also appears that toluene exposure and noise may interact to produce hearing deficits.
COLOR VISION: In a single study of workers exposed to toluene at levels under 50 ppm, small decreases in the ability to discriminate colors in the blue-yellow range have been reported for female workers. This effect, which should be investigated further, is very subtle and would not likely have been noticed by the people tested.
REPRODUCTIVE/DEVELOPMENTAL TOXICITY: Toluene may also cause mental and/or growth retardation in the children of female solvent abusers who directly inhale toluene (usually at thousands of ppm) when they are pregnant. Toluene caused growth retardation in rats and rabbits when administered at doses that were toxic to the mothers. In rats, concentrations of up to 5000 ppm did not cause birth defects. No effects were observed in the offspring at doses that did not intoxicate the pregnant animals. The exposure level at which no effects were seen (No Observed Effect Level, NOEL) is 750 ppm in the rat and 500 ppm in the rabbit.

This product contains xylene.
ACUTE TOXICITY: The primary effects of exposure to xylene in animals and humans are on the central nervous system. In addition,in some individuals, xylene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation. DEVELOPMENTAL TOXICITY: Xylene has been reported to cause developmental toxicity in rats and mice exposed by inhalation during pregnancy. The effects noted consisted of delayed development and minor skeletal variations. In addition, when pregnant mice were exposed by ingestion to a level that killed nearly one-third of the test group, lethality (resorptions) and malformations (primarily cleft palate) occurred. Since xylene can cross the placenta, it

may be appropriate to prevent exposure during pregnancy. GENETIC TOXICITY/CARCINOGENICITY: Xylene was not genotoxic in several mutagenicity testing assays including the Ames test. In a cancer study sponsored by the National Toxicology Program (NTP),technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years. HEARING: Mixed xylenes have been shown to cause measurable hearing loss in rats exposed to 800 ppm in the air for 14 hours per day for six weeks. Exposure to 1450 ppm xylene for 8 hours caused hearing loss while exposure to 1700 ppm for 4 hours did not. Although no information is available for lower concentrations, other chemicals that cause hearing loss in rats at relatively high concentrations do not cause hearing loss in rats at low concentrations. Worker exposure to xylenes at the permissible exposure limit (100 ppm, time-weighted average) is not expected to cause hearing loss.

MTBE
GENERAL TOXICITY: In rats, exposure to MTBE vapor for thirteen weeks produced changes to organ weights, mild lesions, and produced kidney changes consistent with accumulation of alpha-2-microglobulin, an effect specific to male rats and not relevant to human health assessment; none of the effects met the criteria for target organ classification.
BIRTH DEFECTS AND REPRODUCTION: In mice, MTBE inhalation during pregnancy harmed prenatal development at maternally toxic levels. No prenatal harm was observed in rats or rabbits exposed to MTBE vapor, nor to rat reproduction.
GENETIC TOXICITY: MTBE was positive under certain conditions in the mouse lymphoma test, but negative for mutagenicity in bacteria, chromosomal aberrations in rats or mice, and unscheduled DNA synthesis.
CARCINOGENICITY: A lifetime oral dosing study reported that MTBE increased tumors in Leydig cells of the testes and lymphomas and leukemias in female rats. A repeat study with MTBE in drinking water did not replicate these findings, but had a significant trend for brain astrocytomas in male rats that was within historical control values and interpreted as not associated with MTBE exposure. A follow up pathology study using immunohistochemistry staining reclassified all the brain lesions originally diagnosed as astrocytomas to malignant microglial tumors, which are not considered relevant to human health. A lifetime inhalation study in mice and rats showed increased liver tumors in female mice at the highest MTBE exposure, and testicular tumors and kidney tumors associated with male rat hydrocarbon nephropathy; neither rat tumor was considered relevant to human health assessment.

OTHER: Appropriate precautions should be taken to prevent releases of gasoline with MTBE into the environment. MTBE is generally more soluble in water than other gasoline constituents, and under certain circumstances, MTBE can move further and faster in groundwater than other gasoline constituents. MTBE may also take longer than other gasoline constituents to biodegrade in the environment, depending on local subsurface conditions. Therefore, MTBE has the potential to persist in the environment longer than other gasoline constituents.
MTBE can also adversely affect the taste and odor of drinking water at relatively low levels. The U.S. Environmental Protection Agency has issued guidance that MTBE in drinking water at levels of 20 ppb or higher may cause unpleasant taste and odor for some people.

G/MTBE vapor
Repeated inhalation exposure to high-levels of gasoline/MTBE vapor for thirteen weeks produced evidence of alpha-2-microglobulin accumulation, an effect specific to male rats and irrelevant to human health assessment. This exposure did not harm reproduction, prenatal development below exposure levels that harmed maternal health, or
increase bone marrow micronuclei, but there was an increased incidence of sister chromatid exchange in peripheral lymphocytes in female rats, considered an indication of chromosomal instability rather than genetic toxicity. In male rats, chronic, high-level inhalation exposure to gasoline/MTBE vapor did not increase the incidence of any tumors thought to be relevant to humans.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: 3YE

ADG/ADOT Shipping Description:UN1203, GASOLINE, 3, II

IMO/IMDG Shipping Description:UN1203, GASOLINE, 3, II, FLASH POINT SEE SECTION 9, MARINE POLLUTANT (GASOLINE)

ICAO/IATA Shipping Description:UN1203, GASOLINE, 3, II

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5
02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6
02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7
02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10
02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E
02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F
02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J
02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

The following components of this material are found on the regulatory lists indicated.

Xylene	02-5, 02-6, 02-E, 02-F, 02-S
Toluene	02-5, 02-6, 02-E, 02-F, 02-S
Hexane	02-5, 02-E, 02-S
Benzene	02-7, 02-E, 02-F, 02-J
Naphthalene	02-10, 02-6, 02-E, 02-F

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), EINECS (European Union), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 01 - Product Identifier information was modified.

Review Date: January 28, 2022

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code

API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Safety Data Sheet

SECTION 1 IDENTIFICATION

Brake and Clutch Fluid DOT 4

Product Use: Brake Fluid
Product Number(s): 510663
Company Identification
Chevron Australia Downstream Pty Ltd
365 MacArthur Avenue
Hamilton, QLD 4007
Australia

Transportation Emergency Response
CHEMTREC: +61-290372994 or +1 703-741-5970
Health Emergency
Chevron Emergency Information Center: +1 800 009 010
Product Information
Product Information: +1 300 723 706
SDS Requests: +1 300 723 706

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:

- Eye irritation: Category 2A.
- Reproductive toxicant: Category 2.

Signal Word: Warning
Health Hazards:
- Causes serious eye irritation (H319).
- Suspected of damaging fertility or the unborn child (H361).

PRECAUTIONARY STATEMENTS:
Prevention:
- Obtain special instructions before use (P201).
- Do not handle until all safety precautions have been read and understood (P202).
- Wash thoroughly after handling (P264).
- Wear protective gloves/protective clothing/eye protection/face protection (P280).

Response:
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and

easy to do. Continue rinsing (P305+P351+P338).
- IF exposed or concerned: Get medical advice/attention (P308+P313).
- If eye irritation persists: Get medical advice/attention (P337+P313).

Storage:
- Store locked up (P405).

Disposal:
- Dispose of contents/container in accordance with applicable local/regional/national/international regulations (P501).

SECTION 3 COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

COMPONENTS	CAS NUMBER	AMOUNT
Triethylene glycol monobutyl ether	143-22-6	20 - < 30 %weight
Diethylene glycol	111-46-6	15 - < 25 %weight
Triethylene glycol monomethyl ether borate ester	30989-05-0	5 - 20 %weight
Polyethylene glycol monobutyl ether	9004-77-7	5 - 10 %weight
Diethylene glycol monobutyl ether	112-34-5	< 3 %weight
Diethylene glycol monomethyl ether	111-77-3	< 3 %weight

Note that the remaining composition contains nonhazardous ingredients or hazardous ingredients below the relevant threshold up to 100%.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get immediate medical attention.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

IMMEDIATE HEALTH EFFECTS
Eye: Contact with the eyes causes severe irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.
Skin: High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled.

DELAYED OR OTHER HEALTH EFFECTS:
Reproduction and Birth Defects: Contains material that may cause adverse reproductive effects if swallowed based on animal data. See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 5 FIRE FIGHTING MEASURES

HazChem Code: None Allocated

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
Unusual Fire Hazards: Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed. Do not get in eyes, on skin, or on clothing. Do not get in eyes. Do not taste or swallow. Wash thoroughly after handling. Keep out of the reach of children.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, refer to PPE information below.

Factors that affect PPE include, but are not limited to: properties of the chemical, other chemicals which may contact the same PPE, physical requirements (fit & sizing, cut/puncture protection, dexterity, thermal protection, etc.), and potential allergic reactions to the PPE material. It is the responsibility of the user to read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use general ventilation, local exhaust ventilation, or a combination of both.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear chemical personal protective equipment (PPE) to prevent skin contact. Selection of chemical protective clothing should be performed by an Occupational Hygienist or Safety Professional and be based upon applicable standards (ASTM F739 or EN 374). Using chemical PPE depends upon operations conducted and may include chemical gloves, boots, chemical apron, chemical suit, and complete facial protection. Refer to PPE manufacturers to obtain breakthrough time information to determine how long PPE can be used before it needs to be replaced. Unless specific glove manufacturer data indicates otherwise, the below table is based upon available industry data to assist in the glove selection process and is intended to be used as reference only.

Chemical Glove Material	Thickness (mm)	Typical Breakthrough Time (minutes)
Butyl	0.7	120
Neoprene	0.75	30
Nitrile	0.8	30
Nitrile	0.11	5
Polyvinyl Chloride (PVC)	1.1	15
Viton Butyl	0.3	120

Respiratory Protection: No respiratory protection is normally required.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Diethylene glycol	Australia Workplace	--	100 mg/m3	--	--	--
Diethylene glycol monobutyl ether	ACGIH	Inhalable fraction and vapor	10 ppm	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Amber
Physical State: Liquid
Odor: Faint or Mild
Odor Threshold: No data available
pH: 7 - 11.5
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Initial Boiling Point: 215°C (419°F) (Minimum)
Solubility: Miscible
Freezing Point: No data available
Melting Point: No data available
Density: 1.03 kg/l - 1.04 kg/l @ 20°C (68°F) (Typical)
Viscosity: 1.50 cSt @ 100°C (212°F) (Minimum)
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: Not Applicable
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): Not Applicable

Flashpoint: (Pensky-Martens Closed Cup) > 93 °C (> 199 °F)
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data available

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: This material causes serious eye irritation. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Corrosion/Irritation: The material is not considered a skin irritant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Skin Sensitization: The material is not considered a skin sensitizer. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The material is not considered a dermal toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The material is not considered an oral toxicant. The product has not been tested.

The statement is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The material is not considered an inhalation toxicant. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The material is not considered a mutagen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Carcinogenicity: The material is not considered a carcinogen. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Reproductive Toxicity: This material is suspected of damaging fertility or the unborn child. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Single Exposure: The material is not considered a target organ toxicant (single exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Specific Target Organ Toxicity - Repeated Exposure: The material is not considered a target organ toxicant (repeated exposure). The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Aspiration Hazard: The material is not considered an aspiration hazard.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains diethylene glycol (DEG). The estimated oral lethal dose is about 50 cc (1.6 oz) for an adult human. DEG has caused the following effects in laboratory animals: liver abnormalities, kidney damage and blood abnormalities. It has been suggested as a cause of the following effects in humans: liver abnormalities, kidney damage, lung damage and central nervous system damage.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is expected to be readily biodegradable. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may

meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

HazChem Code: None Allocated

ADG/ADOT Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR ROAD OR RAIL TRANSPORT UNDER THE ADG CODE

IMO/IMDG Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description:NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-5=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 5
02-6=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 6
02-7=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 7
02-10=The Standard for the Uniform Scheduling of Medicines and Poisons - Schedule 10
02-E=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix E
02-F=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix F
02-J=The Standard for the Uniform Scheduling of Medicines and Poisons - Appendix J
02-S=The Standard for the Uniform Scheduling of Medicines and Poisons - Solvents List

The following components of this material are found on the regulatory lists indicated.

Diethylene glycol	02-10, 02-5, 02-6
Diethylene glycol monomethyl ether	02-10, 02-5, 02-6
Diethylene glycol monobutyl ether	02-5, 02-E, 02-F

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 08 - Engineering Control Measures information was modified.
SECTION 08 - General Considerations information was modified.
SECTION 08 - Occupational Exposure Limit Table information was modified.

SECTION 08 - Personal Protective Equipment List information was deleted.
SECTION 08 - Personal Protective Equipment information was added.
SECTION 08 - Skin Protection information was modified.
SECTION 09 - Physical/Chemical Properties information was modified.

Review Date: December 28, 2022

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NTP - National Toxicology Program (USA)
DOT - Department of Transportation (USA)	
IARC - International Agency for Research on Cancer	

Prepared according to the Model Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals 2020 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, California 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Appendix 3

Traffic Plan

Legend:

- Transport Trucks
- Light Vehicles
- Main Haul Roads
- Overhead Powerlines

Appendix 4

Waste Management Plan

WASTE MANAGEMENT PLAN

TERREQUIP MILES BENTONITE MINE

prepared by Ausrocks Resource Consultants
for Department of Environment and Science

AUQ00238F

TERREQUIP MILES PTY LTD

MILES BENTONITE MINE – WASTE MANAGEMENT PLAN

7 FEBRUARY 2024

AUSROCKS RESOURCE CONSULTANTS

Unit 3, 50 Northlink Place
Virginia, QLD, 4014

Email: info@ausrocks.com.au
Phone: (07) 3161 4108
www.ausrocks.com.au
ABN: 64 056 939 014

Document Control

General Information

Item	Detail
Project Name	Miles Bentonite Mine
Project Number	AUQ00238F
Document Title	Waste Management Plan
File Name	EPML00382513-WMP-Miles
File Location	\00238_Terrequip Pty Ltd\F - Miles\Mine Planning\SBMP\SBMP 2023\WMP
Revision Status	1.0

Revision History

Revision	Issue	Prepared by	Reviewed by	Date
1.0	Draft	RM	CM	25/01/2024
1.0	Final	RM	CM	7/02/2024

Issue Register

Date	Distribution List
7/02/2024	Terrequip Miles Pty Ltd
7/02/2024	Department of Environment and Science

Limitations

This document has been prepared on behalf of and for the exclusive use of the client. This document has been prepared with all due care and attention according to accepted practices and techniques. This document is intended only for the client and may not be relied upon by any other person.

In preparing this document, Ausrocks Pty Ltd has relied upon, and presumed accurate, certain information (or absence thereof) relative to data provided by government officials and authorities, the client, and other sources as identified in the document. Except as otherwise stated, Ausrocks Pty Ltd has not attempted to verify the accuracy or completeness of any such information.

Ausrocks Pty Ltd accepts no responsibility for any misuse or application of the material set out in this document for any purpose other than the purpose for which it is provided. Ausrocks Pty Ltd accepts no responsibility for any damages of whatsoever nature, however caused arising from misapplication or misinterpretation by third parties of the contents of this document.

This document has been reviewed and signed off by the undersigned:

Carl Morandy (RPEQ22981)

Managing Director, Ausrocks Pty Ltd

Table of contents

List of figures

List of tables

Terms & Abbreviations

ARC	Ausrocks Resource Consultants (Ausrocks Pty Ltd)
DES	Department of Environment and Science
EA	Environmental Authority
EMR	Environmental Management Register
EOW	End of waste
EP Act	*Environmental Protection Act 1994*
EP Regulation	*Environmental Protection Regulation 2019*
EPP (Waste)	*Environmental Protection (Waste Management) Policy 2000*
EPR (Waste Management)	*Environmental Protection (Waste Management) Regulation 2000*
ML	Mining Lease
SBMP	Site Based Management Plan
Site	Miles Bentonite Mine
Terrequip	Terrequip Miles Pty Ltd
WMP	Waste Management Plan
WRR Act	*Waste Reduction and Recycling Act 2011*
WRR Regulation	*Waste Reduction and Recycling Regulation 2023*

1 INTRODUCTION

This Waste Management Plan (WMP) is prepared for the Miles Bentonite Mine (site) owned and operated by Terrequip Miles Pty Ltd (Terrequip) for mining leases (MLs) ML5898, ML5900, ML5901, ML5902, ML5905, ML5906, ML5907, ML5909, ML50058 under environmental authority (EA) EPML00382513.

1.1 Scope

This WMP provides for the effective management and handling of waste generated by the construction, operation and decommissioning of the site.

This WMP relates to all aspects of site operations and is designed to provide guidance to ensure wastes generated are managed in an environmentally responsible manner. The WMP incorporates Terrequip's current waste management practices, and strategies for improving waste management practices.

1.2 Objectives

The objectives of this plan are to address the following:

- the types and amounts of waste generated by site operations;
- how waste will be dealt with, including a description of the types of waste that will be dealt with under waste management practices and the waste management hierarchy;
- procedures for identifying and implementing opportunities to improve waste management practices;
- procedures for dealing with accident, spill and other incidents that may impact on waste management;
- details of any accredited management system employed (or planned to be employed) to deal with waste;
- how often the performance of the waste management practices will be assessed;
- the indicators or other criteria on which the performance of the waste management practices will be assessed; and
- the indicators or other criteria on which the performance of the waste management practices will be assessed.

2 GOVERNING DOCUMENTS

2.1 Relevant legislation

Federal, State and/or Local Government legislation applicable to this WMP include:

- *Environmental Protection Act 1994* (EP Act);
- *Environmental Protection Regulation 2019* (EP Regulation);
- *Environmental Protection (Waste Management) Policy 2000* (EPP (Waste));
- *Environmental Protection (Waste Management) Regulation 2000 (EPR (Waste Management));*
- *Waste Reduction and Recycling Act 2011* (WRR Act);
- *Waste Reduction and Recycling Regulation 2023* (WRR Regulation); and
- *Environmental Authority EPML00382513*

2.2 Other resources

- DES (April 2022) – Overview of Regulated Waste Categorisation Information Sheet (ESR/2019/4749)
- DES (September 2023) – End of Waste Guideline (ESR/2016/3323)
- DES (May 2020) – Waste Tracking Guideline (ESR/2016/2425)
- https://www.business.qld.gov.au/running-business/environment/waste-management

3 WASTE MANAGEMENT PRACTICES

The waste management practices proposed are focused on minimising potential environmental impacts associated with waste generation from site operations. Waste management practices have been divided into two groups: Regulated wastes and Non-regulated wastes.

3.1 Regulated wastes

Chapter 5 of the EP Regulation defines regulated waste as non-domestic wastes that are required to be handled by a certified registered waste transporter and must be disposed of at an appropriately licenced facility under documentation. Where regulated wastes are transported and removed from site, Waste Transportation Certificates (or other suitable form of receipt/record) shall be obtained, compiled and kept for a minimum of 5-years.

Regulated wastes currently generated at the site include, but may not be limited to:

- grease;
- tyres;
- oil;
- waste oil containers;
- oil filters;
- oil absorbent;
- oily rags;
- oily water;
- paints and solvents;
- anti-corrosion agents (radiator fluid/coolant);
- sewage wastes;
- vehicle batteries;
- wash-down bay sludge; and
- chemicals.

3.1.1 Regulated wastes

3.1.1.1 Oil

Waste oil will be transferred from the workshop and service vehicles and stored on-site in a bunded facility (compound, temporary or pallet) prior to removal from site by a licenced waste oil contractor. Oil shall be collected and transported off-site by a licenced regulated waste transporter to a licensed regulated waste receiver for recycling.

3.1.1.1 Waste oil drums

Waste oil drums shall be recycled and used for waste oil storage prior to collection. Waste oil drums shall be drained on-site, and drums shall be transported off-site by an appropriately licenced waste contractor for off-site reuse, recycling or disposal. Oil shall be collected and transported off-site by a licenced regulated waste transporter to a licensed regulated waste receiver for recycling.

3.1.1.2 Oily rags and residues

Waste oily rags are predominantly generated by workshop and maintenance activities. Wate oily rags shall be placed into dedicated bins in workings areas and shall be collected by an accredited contractor under appropriate documentation.

3.1.1.3 Oil absorbent

Waste oil absorbent is generated from accidental spill clean-up. Waste oil absorbent shall be placed in bags and in designated bins (with oily rags). The spill response process is to control, contain, absorb and dispose of the spilt material. Spill kits shall be available on service vehicles, in the workshop area and in fuel/chemical storage areas. Training shall be provided to site personnel and contractors in the correct and appropriate management of chemicals and wastes. Any used absorbent materials shall be returned to the spill kit and removed by a licensed contractor.

In the event the site becomes contaminated, the land shall be investigated, managed and remediated in accordance with the requirements of the contaminated land provisions in the EP Act.

3.1.1.4 Grease

Waste grease will be collected in bulk containers and removed by a licenced regulated waste transporter to a licensed regulated waste receiver for recycling or for treatment and disposal under appropriate documentation. Waste grease is predominantly generated by mobile and fixed plant equipment and shall be collected by service trucks and the workshop.

Bulk and supplementary grease containers shall be disposed of as necessary and as appropriate based on type (e.g. grease cartridges).

3.1.1.5 Anti-corrosion agents (radiator fluid/coolant)

Waste coolant will predominantly be generated by the mobile and fixed plant. Waste coolant shall be collected by service vehicles and the workshop and transferred to the waste oil compound and disposed of as described as described in **Section 3.1.1.1**.

3.1.1.6 Tyres

Waste tyres shall be reused on site as barriers, where appropriate. Surplus waste tyres shall be stored near the workshop area in stockpiled volumes less than 3m in height and 200m^2 in areas, and at least 10m from any

other tyre storage area. As required, stockpiled waste tyres shall be transported off-site by a licenced regulated waste transported to a licensed regulated waste receiver.

3.1.1.7 Chemicals

Chemicals shall be disposed of as required depending on chemical type, and in consultation with an accredited waste removal contractor. Bulk material containers shall be used where possible to reduce the volume of waste generated.

3.1.1.8 Vehicle batteries

Waste batteries shall be stored near the workshop and will be collected and recycled or disposed of by an accredited contractor after a sufficient quantity is stockpiled for collection.

3.1.1.1 Sewage wastes

Sewage waste from mobile infrastructure (e.g. mobile crib hut) and fixed infrastructure locations (e.g. office) shall be collected in an approved septic tank sewage system located on site. Sewage waste shall be managed by accredited by accredited contractors and disposed of off-site. The septic tank meets Council system requirements.

3.2 Non-regulated wastes

Non-regulated wastes are all wastes not included in Chapter 5 of the EP Regulation. Non-regulated wastes form the ‘general waste’ stream generated by site operations.

Non-regulated wastes currently generated at the site include, but may not be limited to:

- air filters;
- aluminium cans;
- cardboard and paper;
- printer cartridges;
- other office recyclables;
- garden/green waste and cleared vegetation;
- general waste (domestic and sewage waste);
- bulka bags and plastics;
- scrap metal/steel;
- wooden pallets/timber;
- rubber (e.g. conveyor belts, linings);
- excavated waste;
- concrete;
- electrical wastes;
- clay processing wastes

3.2.1 Non-regulated wastes

3.2.1.1 Paper and cardboard

Cardboard and paper shall be collected in dedicated waste bins/skip bins and transferred to a Council refuse and recycling facility by an accredited waste removal contractor.

3.2.1.2 Aluminium cans

Aluminium cans including aerosol cans shall be collected in designated recycling containers and transferred to a Council refuse and recycling facility by an accredited waste removal contractor.

3.2.1.3 Bulka bags and plastics

Waste bulka bags and plastics shall be collected in dedicated waste bins/skip bins and transferred to a Council refuse and recycling facility by an accredited waste removal contractor.

3.2.1.4 Rubber

Waste rubber will predominantly be generated from plant equipment and the workshop (e.g. conveyor belts, linings). Waste rubber shall be collected and segregated on-site prior to removal by an accredited waste removal contractor.

3.2.1.5 Scrap metals

Scrap metal shall be placed in dedicated scrap metal bins located near the workshop. Scrap metal bins shall be collected and removed off-site by scrap metal merchant. Where possible, generation of scrap metal shall be minimised by producing/procuring only the amount necessary for site activities.

3.2.1.6 Office recyclables

Recyclables generated from office activities (e.g. glass containers, cardboard cartons, plastic containers) shall be collected in designated recycling containers and transferred to a Council refuse and recycling facility by an accredited waste removal contractor.

3.2.1.7 General waste

General waste shall be collected in appropriate waste containers across the site and transferred to a dedicated skip bin(s) for collection by an accredited waste removal contractor for disposal to a Council refuse facility.

3.2.1.8 Clay processing waste

Clay processing wastes including oversized rock in raw feed (i.e. ‘trash’), clay materials and clay dust are produced during the pulverising, screening, fine-grinding and processing of bentonite clay materials. These processing wastes do not contain hazardous contaminants and shall be used in site maintenance and rehabilitation or are emplaced in the mine void prior to backfilling and rehabilitation.

Where possible, waste products (e.g. dust-collector fines) shall be reclaimed and blended into product to minimise wastage.

3.3 End of waste (EOW)

The WRR Act promotes the implementation of the waste and resource management hierarchy in accordance with section 9 of the WRR Act. The hierarchy is a nationally and internationally accepted guide for prioritising waste and resource management practices as follows:

a) AVOID unnecessary resource consumption;
b) REDUCE waste generation and disposal;
c) RE-USE waste resources without further manufacturing;
d) RECYCLE waste resources to make the same of different product;
e) RECOVER waste resources, including the recovery of energy;
f) TREAT waste before disposal, including reducing hazardous nature of waste; and
g) DISPOSE of waste only if there is no viable alternative.

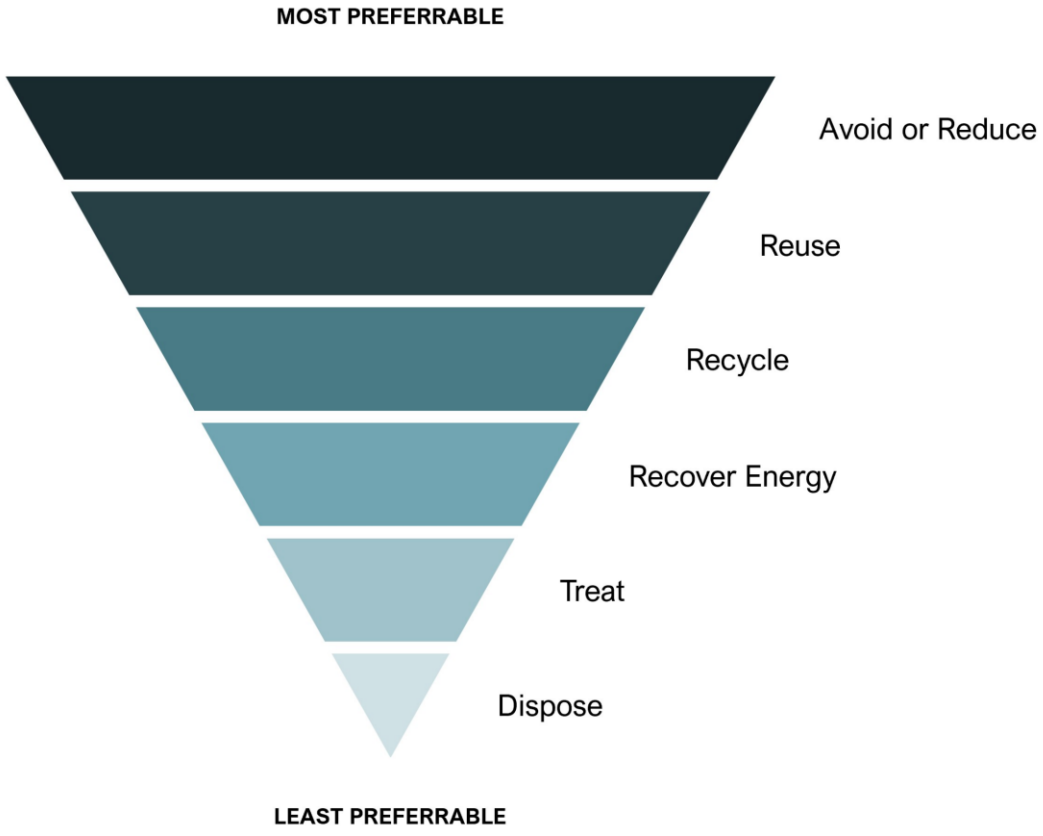


Figure 1: Waste and resource management hierarchy

3.4 Waste tracking

Under the EP Regulation waste handlers must submit waste tracking information when transporting regulated waste or waste residues. Waste tracking ensures that waste is transported and managed in a way that helps prevent illegal waste management activities, which may cause environmental harm.

The facility receiving the waste must also hold an EA for the relevant ERAs(s) for storage, recycling and treating or disposing of the waste.

Per section 12 of the EP Regulation the waste generator (i.e. the site) must give all of the following information to the waste transporter:

- name address, local government area and contact details and ABN (if a business) or the generator identification number;
- name, address, contact details and EA number of the receiver;
- name, address, contact details, vehicle registration and EA number of the transporter;
- time and date the transporter receives the waste;
- load number or unique identifier for transportation;
- load consignment number (if waste is being transported outside of Queensland);
- type and number of containers waste is contained (if waste is a dangerous good); and
- details of the waste including:
    - type of waste;
    - quantity of waste (expressed as kilograms (kg) or litres (L));
    - physical nature of the waste (solid, liquid, gas);
    - waste code; and
    - if the waste is a dangerous good:
        - its UN number;
        - its packing group designator; and
        - its dangerous goods class and any subsidiary risk.8

4 NOTIFIABLE ACTIVITIES

Schedule 3 of the EP Act describes 'notifiable activities' that require sites to be listed on the Environmental Management Register (EMR). The following notifiable activities are relevant for the site:

- **29(b) Petroleum product or oil storage in above ground tanks with**–
    - (i) for petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code–more- than 2,500L capacity; or
    - (iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS 1940, 'The storage and handling of flammable combustible liquids' published by Standards Australia–more than 25,000L capacity.

Diesel fuel and LPG gas is stored on ML5902. During mining campaigns, it is stored on ML5909 in standards compliant tanks.

5 MONITOR AND REVIEW

This WMP will be reviewed and updated where required (as new processes, waste streams, waste classifications, or major inconsistencies are identified) by the Site Manager/Supervisor or other appropriately qualified person(s) on a bi-annual basis to:

- ensure the aims and objectives of this WMP remain satisfied;
- assess the performance of waste management at the site; and
- investigate opportunities for improvement of waste management.

Review of waste management strategies shall consider the 'waste management hierarchy' to minimise waste where possible and maintain appropriate management.

5.1 Corrective action and adaptive management

Terrequip shall implement an appropriate program to address any outstanding non-conformances as a result of monitoring and review of the WMP. Corrective actions shall be recorded, and responsibility assigned to the appropriate person(s) for action and close out.

Appendix 5

Bushfire Management Plan

BUSHFIRE MANAGEMENT PLAN

TERREQUIP MILES BENTONITE MINE

prepared by Ausrocks Resource Consultants
for Department of Environment and Science

AUQ00238F

TERREQUIP MILES PTY LTD

MILES BENTONITE MINE – BUSHFIRE MANAGEMENT PLAN

7 FEBRUARY 2024

AUSROCKS RESOURCE CONSULTANTS

Unit 3, 50 Northlink Place
Virginia, QLD, 4014

Email: info@ausrocks.com.au
Phone: (07) 3161 4108
www.ausrocks.com.au
ABN: 64 056 939 014

Document Control

General Information

Item	Detail
Project Name	Miles Bentonite Mine
Project Number	AUQ00238F
Document Title	Bushfire Management Plan
File Name	EPML00382513-BMP-Miles
File Location	\00238_Terrequip Pty Ltd\F - Miles\Mine Planning\SBMP\SBMP 2023\BMP
Revision Status	1.0

Revision History

Revision	Issue	Prepared by	Reviewed by	Date
1.0	Draft	RM	CM	25/01/2024
1.0	Final	RM	CM	7/02/2024

Issue Register

Date	Distribution List
7/02/2024	Terrequip Miles Pty Ltd
7/02/2024	Department of Environment and Science

Limitations

This document has been prepared on behalf of and for the exclusive use of the client. This document has been prepared with all due care and attention according to accepted practices and techniques. This document is intended only for the client and may not be relied upon by any other person.

In preparing this document, Ausrocks Pty Ltd has relied upon, and presumed accurate, certain information (or absence thereof) relative to data provided by government officials and authorities, the client, and other sources as identified in the document. Except as otherwise stated, Ausrocks Pty Ltd has not attempted to verify the accuracy or completeness of any such information.

Ausrocks Pty Ltd accepts no responsibility for any misuse or application of the material set out in this document for any purpose other than the purpose for which it is provided. Ausrocks Pty Ltd accepts no responsibility for any damages of whatsoever nature, however caused arising from misapplication or misinterpretation by third parties of the contents of this document.

This document has been reviewed and signed off by the undersigned:

Carl Morandy (RPEQ22981)

Managing Director, Ausrocks Pty Ltd

Table of contents

List of figures

List of tables

List of appendices

Terms & Abbreviations

AHD	Australian Height Datum
ARC	Ausrocks Resource Consultants (Ausrocks Pty Ltd)
BMP	Bushfire Management Plan
BOM	Bureau of Meteorology
DES	Department of Environment and Science
EA	Environmental Authority
ESA	Environmentally Sensitive Area
FBI	Fire Behaviour Index
FDI	Fire Danger Index
LGA	Local Government Area
ML	Mining Lease
QFES	Queensland Fire and Emergency Service
QPS	Queensland Police Service
RFB	Rural Fire Brigade
SBMP	Site Based Management Plan
Site	Miles Bentonite Mine
SSE	Site Senior Executive
Terrequip	Terrequip Miles Pty Ltd

Definitions

Bushfire	An uncontrolled fire burning in a forest, scrub or grassland vegetation, also referred to as a wildfire.
Bushfire Threat	The threat of harm to site and/or site operations as a consequence of a bushfire.
Emergency	Any incident, which has occurred or is likely to occur, which causes injury to any person, damage to property, damage to the environment or significant disruption to normal business operations and which requires urgent or coordinated response. Emergency incidents include disasters.
Fire Break	Narrow constructed barriers of bare ground intended to stop bushfires.
Fire Suppression	Activities connected with restricting the spread of a fire following its detection and before making it safe.
Fuel Management	Modification of fuel levels through prescribed burning or by other means.
Hazard	Something with the potential to cause harm, including plant, work processes and work environment.
High Risk Activities	Any activity which increases the likelihood of a bushfire associated with those operations.
Ignition Source	A source of energy sufficient to initiate combustion.
Initial Attack	The first fire suppression work on a fire.
Preparation	Preparation involves taking measures which enable risks to be identified, controls applied, response plans, strategies and measures tailored to risks, and response measures rehearsed and practiced ensuring effectiveness.
Prescribed Burning	The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives.
Prevention	Prevention includes the identification of hazards, the assessment of threats to life and property, and ensuring protective measures are in place to reduce potential loss of life and property damage.
Recovery	The long-term activities beyond the initial crisis period beyond the initial crisis period and emergency response phase of disaster operations. During recovery, focus is on returning all systems in the community to a normal status or to reconstitute these systems to a new condition that is less vulnerable.
Response	Response involves taking effective measures immediately prior to and immediately following an emergency incident to minimise the effects and to prevent further escalation. For example, the actions directly associated with fighting a fire.
Risk	The likelihood that harm may occur when exposed to the hazard.
Vegetation Fires	Refers to all unplanned Bush and Grass fires for the purposes of the Bushfire Management Plan.

1 INTRODUCTION

This Bushfire Management Plan (BMP) is prepared for the Miles Bentonite Mine (site) owned and operated by Terrequip Miles Pty Ltd (Terrequip) for mining leases (MLs) ML5898, ML5900, ML5901, ML5902, ML5905, ML5906, ML5907, ML5909, ML50058 under environmental authority (EA) EPML00382513.

This BMP is a living document that should be reviewed annually and in preparation of the Queensland Bushfire season and identifies at a strategic level, guiding principles to protect the site and site operations against uncontrolled vegetation (bush or grass) fire. This BMP has been designed to provide guidance and establish principles by which Terrequip can manage the likelihood and consequence from vegetation fires. This BMP should be used to inform the development of the site BMPs and establish principles and practices to be utilised in the reduction and mitigation of and the response to bushfires across the entire site.

The aim of this BMP is to provide guidance, which, if applied across the site, will minimise the likelihood consequence and risk of adverse impacts arising from vegetation fires on life, property and the environment.

1.1 Scope

The BMP provides for the effective management of the risk of bushfire to site operations and/or as a consequence of Terrequip and/or as a consequence of site operations on or directly associated.

1.2 Objectives

The objectives of this plan are designed to:

- develop an increased understanding of the bushfire risk profile and contemporary bushfire risk management across the site and its operations;
- enable constructive consultation with the community, all relevant local fire management authorities and other key stakeholders;
- take all necessary action to prevent, eliminate or mitigate fire ignition sources;
- to eliminate or mitigate the risk of bushfire by proactively managing vegetation on site, reduce the likelihood, the rate of spread and intensity of bushfire, while minimising environmental and ecological impacts;
- increase site resilience to vegetation fires by improving preparedness through appropriate planning, mitigation activities and suppression capabilities; and
- effectively contain fires with a potential to cause damage to life, property and/or the environment through an appropriate response capability, and through active support of local Queensland Rural Fire Brigade (RFB) or Queensland Fire and Emergency Service (QFES) elements.

2 GOVERNING DOCUMENTS

2.1 Relevant Legislation

Federal, State and/or Local Government legislation applicable to this BMP include:

- *Fire and Rescue Service Act 1990*
- *Work Health and Safety Act 2011*
- *Work Health and Safety Regulation 2011*
- *Vegetation Management Act 1999*
- *Sustainable Planning Act 2009*
- *Nature Conservation Act 1992*
- *Environmental Protection Act 1994*

2.2 Australian Standards

Australian Standards applicable to this BMP include:

- AS 3959:2018 Construction of buildings in bushfire-prone areas
- AS 3745-2010 Planning for emergencies in facilities
- AS 2419.1:2021 Fire hydrant installations, Part 1: System design, installation and commissioning
- AS 1851-2012 Routine service of fire protection systems and equipment
- AS 1019-2000 Internal combustion engines – Spark emission control devices
- AS 1940:2017 The storage and handling of flammable and combustible liquids

2.3 Other Resources

- State Planning Policy 1/03 Guideline (June 2003) – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide
- Australasian Fire Authorities Council – Seasonal Bushfire Outlook Spring 2023
- DERM – Erosion Control on Fences and Fire Breaks
- DNRM (February 2020) – General Guide to the Vegetation Clearing Codes
- CSIRO (July 2012) – Queensland Bushfire Risk Planning Project
- Bureau of Meteorology – Fire Weather http://www.bom.gov.au/weather-services/fire-weather-centre/

3 SITE DESCRIPTION

The Miles Bentonite mining leases are grouped into three separate areas, herein described as:

- Gurulmundi Leases – ML5898, ML5902 (processing facility), ML5905 and ML5906
- Ausben Leases – ML5907, ML5909 and ML50058 (mining areas)
- Woleebee Leases – ML5900 and ML5901 (undisturbed land)

The Gurulmundi and Ausben leases are positioned within 1km of each other and are accessible via the Leichhardt Highway and Gurulmundi Road in the Western Downs Regional Council Local Government Area (LGA). These leases are approximately 30km north of Miles and approximately 4.5km southeast of another bentonite mine (Amcol Australia Gurulmundi Mine, operated by Minerals Technologies Incorporated). The Woleebee leases are located approximately 30km north west of the processing facility (ML59002) and are accessible via Jackson Wandoan Road in the Maranoa Regional Council LGA.

The leases are positioned on relatively flat plains and are surrounded by undulating hills with elevation ranging from 360m to 390m AHD in the Gurulmundi and Ausben leases and 310m to 330m AHD in the Woleebee leases.

The Miles area typically experiences a dry humid sub-tropical climate with mean maximum temperatures between 30-33ºC in the warmer months (November to March) and 19-25°C in the cooler months (June to September).

The table below summarises the primary mine features and infrastructure as approved under the EA.

Table 1: Primary mine features and infrastructure at Miles Bentonite

Mine domain	Mine feature name
Ancillary infrastructure	• Mining footprint • Mine infrastructure • Access tracks, ancillary roads and haul roads • Administration, office buildings, carparks and amenities • Laydown areas (including vehicle manoeuvring) • Material storage • Weighbridge • Potable water (bottled)
Dams	• Sediment dams (including sediment controls) • Onsite raw water storage
Combined stockpile areas	• Topsoil stockpiles • Waste rock dumps and overburden stockpiles • Storage pads
Non-mining areas	• Undisturbed land • Rehabilitation areas (complete and in progress)

Mine domain	Mine feature name
Utilities / Services	• Non-potable water (rainwater tanks) • Septic sewage • Power lines • Communications

4 BUSHFIRE RISK CONTEXT

4.1 General Bushfire Risk

The land on which the site operates, and is surrounded by, is predominantly used for grazing characterised by flat plains and undulating hills. Terrequip is not the landholder of all mining leases and therefore does not operate in isolation with numerous other entities and stakeholders who share a responsibility to manage the bushfire risk and hazards, including government agencies, rural producers, private forestry companies and rural residential landowners.

4.2 Bushfire Season

Bushfire season typically occurs during winter and spring (August to November), with the majority of fires starting in September however recent fire data shows that fire season can continued well into the summer if rainfall is unusually low. **Appendix 2** shows the current fire season outlook for Spring 2023 (accessed October 2023).

4.3 Bushfire History

Queensland typically experiences greater losses from cyclone and flood events than it does from bushfires. However, the impacts of a bushfire event is often just as devastating potentially resulting in loss of life and extensive loss of property. Across Queensland, the QFES attend in excess of 13,000 vegetation fires annually; notably very few of these would be considered as major fires. It is indeterminable how many of these fires occur within the area covered by this BMP, as there is little if any formally documented fire history for the site.

4.4 Bushfire Risk

4.4.1 Current Bushfire Risk

Figure 1 illustrates the bushfire risk across the Ausben and Gurulmundi leases per the Western Downs Regional Council Planning Scheme (2019) and Figure the bushfire risk across the Woleebee leases per the Maranoa Regional Council Planning Scheme (2017). Ausben and Gurulmundi leases have an overall medium bushfire hazard due areas of native vegetation and forest surrounding the processing facility (ML5902) and grassland in surrounding properties. The Woleebee leases have a reduced bushfire hazard with an overall low to medium risk. The land on which these leases are positioned, and the surrounding land is relatively clear with little vegetation or forestry.

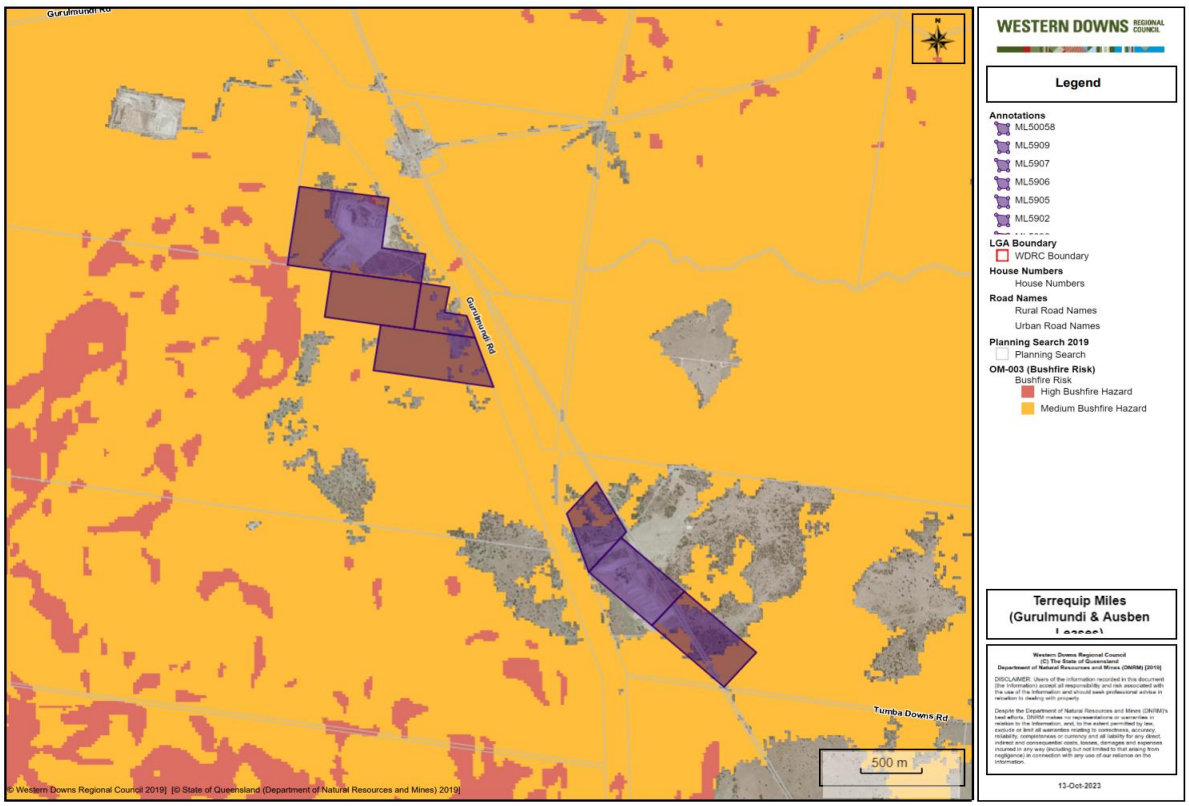


Figure 1: Bushfire risk overlay (Western Downs Regional Council Planning Scheme 2019)

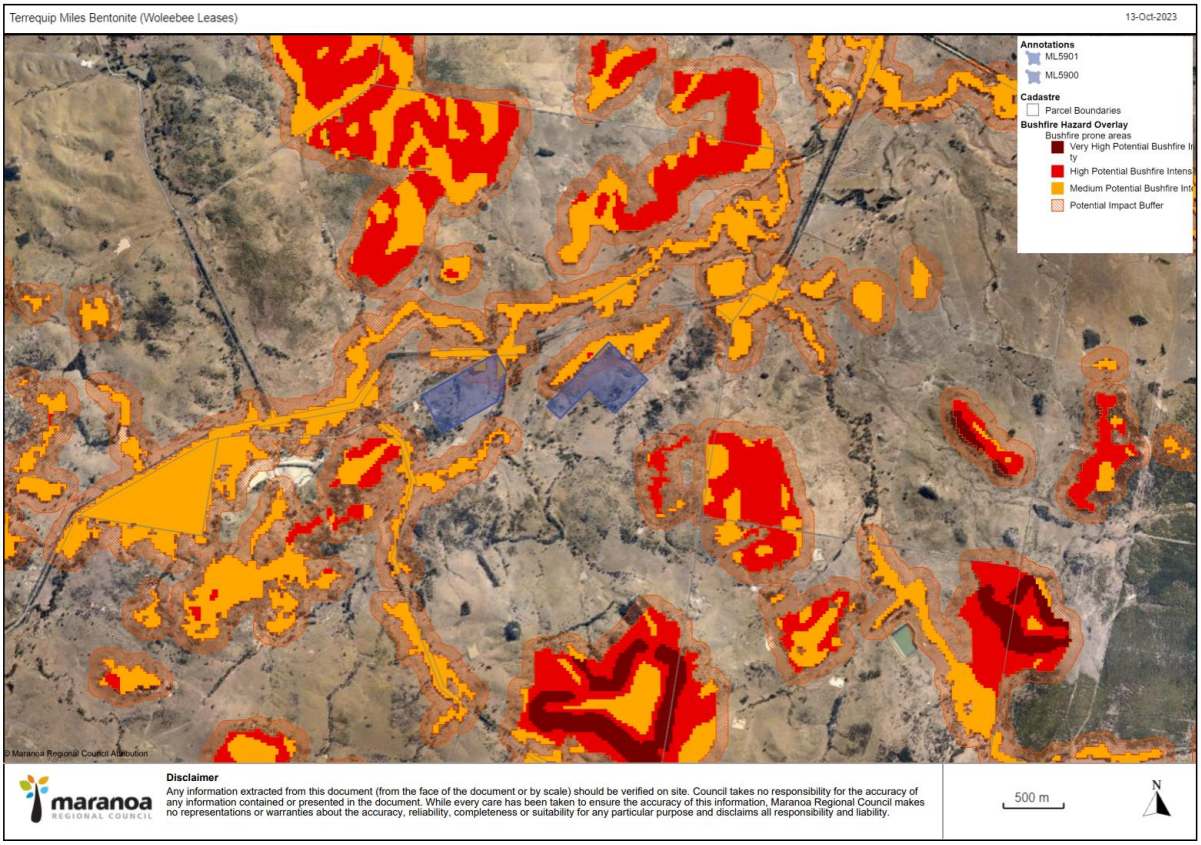


Figure 2: Bushfire risk overlay (Maranoa Regional Council Planning Scheme 2017)

4.4.2 Topography

Fires can burn substantially faster uphill than they do downhill (i.e. the steeper the incline, the faster the fire will burn). Although the region is largely characterised by undulating hills, the three leases are located on relatively flat plains.

4.4.3 Vegetation Types

The type of vegetation can have a direct impact on the behaviour and severity of any bushfire. Grassland vegetation is typically 100% cured (dead) during the fire season making it more suitable to any source of ignition. Grassfires are typically fast-moving, hot fires producing flame heights not higher than 2m. Comparatively, bushfires burn hotter and slower producing much higher flame heights and burning embers that are capable of starting fires well in advance of the main fire body (i.e. spotting). Bush land areas may hold fuel moisture contents well into the fire season and therefore, may not present a significant risk until the year following substantial rainfall.

Table 2: Vegetation communities within of the Terrequip mining leases

Regional Ecosystem	Short description	Biodiversity status[1]	Condition
11.9.10	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarine cristata* on fine-grained sedimentary rocks	Endangered	Non-remnant
11.3.2	*Eucalyptus populnea* woodland on alluvial plains	Of concern	Non-remnant
11.9.5	*Acacia harophylla* and/or *Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks	Endangered	Non-remnant
11.7.6	Corymbia citriodora *or Eycalyptus crebra* woodland on Cainozoic lateritic duricrust	No concern at present	Remnant
11.5.21	*Corymbia bloxomei +/- Callitris glaucophylla +/- Eucalyptus crebra +/- Angophora leiocarpa* woodland	No concern at present	Remnant
11.10.1	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	No concern at present	Remnant
11.7.7	*Eucalyptus fibrosa* subsp. n*ubilis +/- Corymbia spp. +/- Eucalyptus spp.* Woodland on Cainozoic lateritic duricrust	No concern at present	Remnant
11.7.4	*Eucalyptus decorticans* and/or *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.*, *Lysicarpus angustifolius* woodland	No concern at present	Remnant
11.5.4	*Eucalyptus chloroclada*, *Callitris glaucophylla*, *C. endilecheri*, *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	No concern at present	Remnant
11.5.1	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	No concern at present	Remnant
Non-remnant	None	n/a	Non-remnant

[1] *Vegetation Management Act 1999*

4.4.4 Fire Danger Ratings

Bushfire danger is generally calculated using a variety of data. Fire Danger Rating (FDR) ranges from 'No Rating' (low risk) to 'Catastrophic' (**Appendix 1**).

QFES calculate and present data of the FDR (https://www.qfes.qld.gov.au/prepare/bushfire/fire-danger-ratings); this is typically most important between September to January.

5 BUSHFIRE RISK ASSESSMENT

5.1 Risk Assessment Process

The bushfire risk assessment was conducted as aa desktop assessment using available data, information gained from previous bushfire risk assessments and, where required, consultation with QFES/RFB, Department of Environment and Science (DES), Local Government, Terrequip personnel and other interested parties.

At the time of developing this BMP, the Bushfire and Grassland Fire Danger Index and associated risks are considered low to moderate.

5.1.1 Ignition Sources

The bushfire risk assessment identified the following possible sources of ignition as a potential risk to bushfire to site operations:

- high risk activities;
- discarded cigarettes;
- malfunction of fixed electrical infrastructure;
- combustion of flammable materials;
- deliberate acts (arson);
- transport vehicles;
- lighting strike;
- site fire; and
- external bushfire.

5.1.2 Risk Scenarios

An assessment of risk scenarios in which a bushfire could impact the site or adjoining landowners and occupiers determined the following scenarios:

- bushfire from neighbouring landowners and occupiers (including State Forests) impacting site operations;
- fire from site operations impacting landowners and adjoining owners and occupiers; and
- fire from neighbouring landowners and occupiers impacting site operations.

5.1.3 Likelihood

The assessment of likelihood of occurrence considered the following:

- history of events (where information available);
- local knowledge and experience;
- incident investigations;
- potential ignition sources;

- climate and weather conditions.

5.1.4 Impacts

The following table summarises the impacts considered most likely to arise from the identified risk scenarios.

Table 3: Risk assessment impact categories

Category	Impacts
People	• Terrequip staff and contractors; • Rural landowners or occupiers; • Rural residential areas; and • Travellers.
Property	• Agricultural and grazing land (productivity); • Commercial/industrial land; • Commercial forests; • National Parks and State Forests; and • Terrequip infrastructure and equipment.
Environment	• Threatened species, populations and ecological communities; • Endemic species and ecological communities (especially those sensitive to or easily displaced by fire events); • Indigenous and cultural heritage significance; • Non-indigenous heritage; and • Other cultural assets.
Community and Reputation	• Terrequip reputation; • Quarrying and Mining Industry reputation; and • Contractor reputation.

6 BUSHFIRE RISK

Determining bushfire risk is a complex task which requires an understanding of the cumulative effect of sources of ignition, the bushfire hazard, likelihood and consequences. The following risk scores have been generated with consideration of cumulative risk and on the current fire risk rating for the site. Whilst the risk assessment enables a strategic understanding of risk and development of suitable controls to eliminate or mitigate risk.

This BMP shall require annual review to ensure it remains valid for site conditions and operations.

6.1 Overall Bushfire Risk Rating

The overall bushfire risk rating for the site has been determined to be moderate.

6.2 Risk Controls

Bushfire risk controls are specific to the particular risk, and are prioritised in the order of reduction, mitigation, and suppression activities. All controls shall be reviewed annually in accordance with the annual review of this BMP.

Risk treatments will aim to:

- eliminate all possible ignition sources;
- eliminate or restrict available fuel sources;
- enable a prompt and effective suppression response to an outbreak;
- enable situational awareness of current circumstances (fire risk);
- encourage partnerships with landowners and adjoining owners and occupiers; and
- enable safe work practices aligned to Fire Danger Ratings.

6.3 Risk and Control Table

The following table outlines the activity and risk control options to be applied:

Table 4: Activity, bushfire risk and mitigation control

Activity	Initial Risk Rating[1]	Controls	Residual Risk Rating[1]
High Risk Activities	**H**	• Fire Rating Display Board at relevant locations (e.g. site entry); • Issue of Permit to Work (High Risk Operations); • Fixed fire suppression systems; • Portable fire suppression equipment; • Assess fire conditions; • Risk assessment; • Notification of QFES/RFB; • Emergency response team; • Pre-start briefing; • Bushfire Management Plan; • SBMP emergency response procedure; and • Vigilance.	**L**

Activity	Initial Risk Rating[1]	Controls	Residual Risk Rating[1]
Discarded Cigarette	**H**	• Designated smoking areas that comply with local legislative requirements.	**L**
Malfunction of Fixed Electrical Infrastructure	**M**	• Safety in design (insultation, cut-out switches), • Regular inspection and maintenance; and • Supportive attitudes towards defective reporting.	**L**
Combustion of Flammable Materials	**M**	• Compliance with appropriate operational requirements; • AS 1019-2000 Internal combustion engines – Spark emission control devices; • AS 1940:2017 The storage and handling of flammable and combustible liquids; • Defined storage areas (away from potential ignition sources); • Defined refuelling areas; • Reduce and control the use of all combustible materials; • Store and handle combustible materials per SDS; and • Optimise use of diesel.	**L**
Deliberate Acts	**H**	• Minimum fencing and security requirements; • Liaison with QPS; • Site security management; • Incident reporting; and • Vigilance.	**L**
Transport Vehicles	**M**	• Compliance with appropriate operational requirements; • AS 1019-2000 Internal combustion engines – Spark emission control devices; • Risk based inspection and maintenance; • Supportive attitudes towards defective reporting; • Fire extinguishers in vehicles; and • Reduce off-road use with: - Suitable width roads to enable two-way travel; - Designated parking areas; - Enforcing site driving procedures.	**L**
Lightning Strike	**H**	• See hazard reduction (**Section** Error! Reference source not found.)	**L**
Site Fire	**M**	• Fire suppression systems; • Portable fire suppression equipment; • State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide; • AS 3959:2018 Construction of buildings in bushfire-prone areas; • Operation procedures (Plant) • Bushfire Management Plan; and • SBM emergency response procedures.	**L**
External Bushfire	**M**	• State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide; • AS 3959:2018 Construction of buildings in bushfire-prone areas; and • SBMP emergency response procedures.	**L**

[1] *Risk Rating: H = high, M = moderate, L = low risk rating*

7 BUSHFIRE PREVENTION AND MITIGATION

7.1 Annual Bushfire Risk Assessment

Due to the nature and seasonal variability of bushfire hazards, an Annual Bushfire Risk Assessment shall be conducted to inform the site bushfire hazard mitigation and management plans.

The risk assessment will consider:

- local knowledge;
- existing and predicted fuel loads;
- QFES and other relevant agency advice and recommendations;
- BOM and Bushfire Cooperative Research Centre seasonal predictions;
- existing and predicted fire danger ratings;
- status of the site and site activities;
- geographic location of project works; and
- fire history.

7.2 Hazard Management

7.2.1 Hazard Reduction Plan

Due to the variable nature of a bushfire hazard an Annual Bushfire Risk Assessment shall be conducted to inform site hazard reduction plans.

The risk assessment shall consider:

- the scope and objectives of the hazard reduction plan;
- hazard reduction responsibilities;
- consultation and stakeholder engagement strategy (where required);
- establishing agreements with landholders and adjoining owners and occupiers;
- QFES/RFB engagement;
- community and stakeholder engagement; and
- assessment of maps to identify:
    - fire danger areas;
    - strategic and localised fire breaks;
    - programmed hazard reduction activities; and
    - environmentally sensitive areas (ESAs).

7.3 Hazard Reduction

Hazard reduction involves a reduction and/or modification of fuel levels through preventative measures such as prescribed burning. All hazard reduction will be conducted in accordance with the *Vegetation Management Act 1999* and *Nature Conservation Act 1992*.

7.4 Firebreaks

Firebreaks will be utilised to control the spread and potential impact of a bushfire. Where determined, these firebreaks will serve the purpose of preventing the escape of a fire to adjoining properties or land outside mining lease boundaries and preventing the impact of a bushfire to site operations.

Terrequip shall, in agreement with landholders and adjoining owners and occupiers, manage a range of safety and risk issues including the establishment and maintenance of firebreaks around the site. Where required, all firebreaks shall be constructed with reference to:

- local knowledge;
- best practice management and methods;
- local government bylaws; and
- state government legislation, regulations and guidelines.

7.5 Construction of Facilities

Any facilities constructed shall be in accordance with the requirements of:

- relevant local bylaws;
- relevant state legislation, regulations and guidelines;
- State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide; and
- Australian Standard AS3959:2018 Construction of buildings in bushfire-prone areas.

7.6 Incident Investigations

All unplanned fires ignited or suspected of being ignited as a consequence of site operations shall be subject to an internal incident investigation and may be subject to a formal investigation by the relevant authorities such as the Queensland Fire and Rescue Service (QFES), Rural Fire Brigade (RFB), Queensland Police Service (QPS) and/or the Department of Environment and Science (DES).

The aim of an internal investigation is to determine the root cause of the incident and to ensure appropriate corrective action is taken to ensure the incident does not occur again. Lessons learned from an internal investigation shall be used to improve mitigation strategies against the impacts of fires in future.

All such unplanned fires should be treated as a high potential incident.

8 BUSHFIRE PREPARATION

8.1 Consultation and Engagement

Terrequip is committed to establishing an ongoing communication of consultation and engagement with all relevant stakeholders to achieve a reduction in the risk of bushfire across its area of operations.

8.1.1 Queensland Fire and Rescue Service and Rural Fire Brigade

Terrequip shall establish and maintain a close working relationship with the local QFES/RFB in its area of operations where required, including:

- participate in ongoing liaison with QFES/RFB;
- review of this BMP;
- provision of local knowledge for inclusion in the BMP;
- review of hazard reduction plans;
- review of emergency response procedures;
- operational communication protocols;
- sharing of fire risk intelligence;
- consideration of resource support;
- providing location of access roads; and
- conduct emergency response exercises and joint training activities, where required.

8.1.2 Stakeholders

Terrequip shall actively engage with relevant stakeholders and local community, where appropriate, to promote and support effective bushfire management through shared responsibility.

As required, Terrequip shall engage with the following stakeholders:

- landholders and adjoining property owners and occupiers;
- other land managers;
- indigenous communities (where appropriate and identified);
- government agencies and departments;
- managers of roads; and
- safety interface operators.

As required, Terrequip shall engage with stakeholders to ensure the following issues are managed effectively:

- fire break establishment and management plans;
- hazard reduction plans (including any prescribed burns, if any);
- emergency contact lists;
- advice to Terrequip in relation to planned prescribed burns (if any).

8.1.3 Emergency Contact List

Up-to-date emergency contact lists shall be compiled and maintained for landholders on which the site operates, and owners and occupiers of all properties adjoining the site enabling relevant stakeholders to be contacted and advised of any bushfire related activity, threat or issues. Emergency contact lists will be available at the site (in the site office) at all times.

8.1.4 Accessibility

Terrequip recognises that access to a bushfire is critical in successfully combating the bushfire and its impact. Terrequip will assist the QFES/RFB in gaining access to bushfire emergency areas as required and where necessary.

8.1.5 Fire Suppression Equipment

Terrequip shall provide and maintain in operational condition the following fire suppression equipment for use in fire suppression activities, which will be compatible with QFES/RFB:

- fire extinguishers (appropriate to the hazard);
- water truck (used for dust control and firefighting); and
- fire hydrants (site office).

8.2 Preparation for High Risk Activities

8.2.1 High Risk Activities

High risk operations are those which elevate the risk of bushfire associated with those operations. There are currently no high risk operations on site.

8.2.2 Preparations

High risk operations pose a greater risk of igniting a bushfire and therefore require a higher level of preparedness. In addition to general preparations, and where appropriate, the following shall apply:

- Operational Risk Assessment;
- Permit to Work;
- Take 5 for Safety;
- Place of Safety;
- Emergency Response Team;
- First Response Fire Fighting Equipment; and
- Pre-Start Briefing.

8.2.3 Permit to Work

All high risk activities will be subject to approval by SSE and/or the Site Manager prior to the commencement of operations. In approving high risk activities, the SSE and/or Site Manager shall consider the fire rating and gain assurance that all relevant risks have been identified and that the Bushfire Management Plan effectively controls the risks.

8.2.4 Advice to Queensland Fire and Emergency Services and Rural Fire Brigade

QFES and/or RFB will be advised of the conduct of all activities that may increase the fire risk, including the location and nature of those activities.

9 BUSHFIRE RESPONSE

9.1 Emergency Response

The Site Based Management Plan (SBMP) details the processes and procedures that shall be used to manage emergencies which impact on site operations, including bushfires.

9.2 Bushfire Response

9.2.1 Priorities

The following priorities shall guide response to a bushfire emergency event:

- safety of persons;
- safety of property;
- first response; and
- emergency services.

Site personnel engaged in fighting fires shall only continue to fight the fire to the extent that their safety and/or safety of others is preserved. Where danger exists as a consequence of attempting to fight the fire, personnel are to withdraw to a place of safety.

9.2.2 Community Support

Terrequip will provide support to the local community in the advent of a bushfire emergency threat where appropriate, and where trained and capable resources are available and where risk to safety is effectively controlled.

10 BUSHFIRE RECOVERY

The following issues shall be considered following a bushfire emergency:

- SSE shall determine when it is safe to return to facilities based on advice from QFES/RFB;
- SSE shall determine when it is safe to travel through areas via access roads based on advice from QFES/RFB;
- an inspection shall be conducted following a bushfire event that crosses mining lease boundaries to ensure there is no damage which may impact upon the safety of site operations;
- inspections shall include assessment of any trees which may be fire damaged and may pose a risk to infrastructure and/or site operations;
- after returning to site all persons shall remain vigilant for flare-ups and report to the SSE and/or Site Manager; and
- an internal investigation shall be conducted into any fires started or suspected to have started within mining lease boundaries as a consequence of site operations to ensure that any causes are identified, and appropriate corrective action taken as soon as reasonably practicable.

11 ROLES AND RESPONSIBILITIES

11.1 Site Senior Executive (SSE)

The SSE will be responsible for the following items:

- support the effective implementation of the plan;
- provide resources, training and awareness to support the plan;
- assure the currency and validity of the plan;
- coordinate completion of the Annual Bushfire Risk Assessment;
- coordinate provision of relevant emergency management equipment;
- coordinate the engagement of all relevant stakeholders and emergency services;
- coordinate the development of emergency management capability, including training and exercises;
- assure the effective communication of emergency management requirements to relevant personal; and
- coordinate the effective monitoring, audit and review of the emergency response procedures and the BMP.

11.2 Site Manager / Site Supervisor

The Site Manager / Site Supervisor will be responsible for the following items:

- coordinate completion of hazard reduction activities, including obtaining appropriate licenses and/or approvals;
- assure participation in engagement activities with stakeholders and emergency services;
- assure appointment of workers to fulfil emergency management roles and responsibilities, including fire officers;
- prepare for a bushfire emergency in accordance with the emergency management standard, procedures and plans;
- assure that resources and personnel required to support this plan are available, trained and exercised; and
- respond to a bushfire emergency in accordance with the emergency management process and manual.

12 MONITOR AND REVIEW

The content of this plan will be reviewed under the following circumstances:

- change to operations or facilities;
- following a fire emergency;
- as a component of an incident investigation;
- as a result of a significant change in the risk context (e.g. extended drought); and
- annually.

REFERENCES

BOM. (2023). Bureau of Meteorology, Australian Government. http://www.bom.gov.au/

DFES. (2022). Understanding the fire behaviour index - Australian Fire Danger Rating System. Department of Fire and Emergency Services, Western Australian Government.

AFAC. (2023). Seasonal bushfire outlook: Spring 2023. Australasian Fire and Emergency Service Authorities Council. https://www.afac.com.au/auxiliary/publications/newsletter/article/seasonal-bushfire-outlook-spring-2023

Queensland Government. (2023). Queensland Globe. https://qldglobe.information.qld.gov.au/

APPENDICES

Appendix 1 Australian Fire Danger Ratings

Appendix 2 Seasonal Outlook Spring 2023 (Queensland)

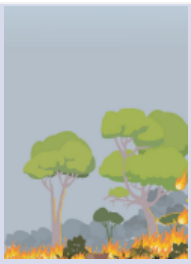
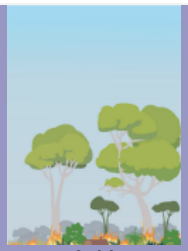
Appendix 3 Australian Bushfire Seasons

Appendix 4 Queensland 6-month vegetation Index (Greenness)

Appendix 1

Australian Fire Danger Ratings[1]

[1] AFDRS (June 2022): Understanding the Fire Behaviour Index.

Fire Danger Rating		Recommended Action and Potential Fire Behaviour and Impact
CATASTROPHIC	 100+	**ACTION: For your survival, leaving early is the best option.** • Fires will be uncontrollable, unpredictable and fast moving. Flames will be higher than roof tops. Thousands of embers will be blown around. Spot fires will move quickly and come from many directions, up to 20km ahead of the fire. • There is a very high likelihood that people in the path of the fire will die or be injured. Thousands of homes and businesses will be destroyed. • House construction standards do not go beyond a Fire Danger Index of 100. • Well prepared, constructed and actively defended homes may not be safe during a fire.
EXTREME	 50-99	**ACTION: Leaving early is the safest option for your survival.** • Fires will be uncontrollable, unpredictable and fast moving. Flames will be higher than roof tops. Thousands of embers will be blow around. Spot fires will move quickly and come from many directions, up to 6km ahead of the fire. • There is a likelihood that people in the path of the fire will die or be injured. Hundreds of homes will be destroyed. • Only well prepared, well-constructed and actively defended houses are likely to offer safety during a fire.
HIGH	 24-49	**ACTION: Leaving early is the safest option for your survival. Only stay if you and your home are well prepared and you can actively defend it during a fire.** • Fires will be uncontrollable and move quickly. Flames may be higher than roof tops. Expect embers to be blow around. Spot fires may occur up to 4km ahead of the fire. • There is a chance people may die or be injured. Some homes and businesses will be destroyed. • Well prepared and actively defended houses can offer safety during a fire.
MODERATE	 12-23	**ACTION: Only stay if you and your home are well prepared and you can actively defend it.** • Fires can be difficult to control. Flames may burn into the tree tops. Expect embers to be blown ahead of the fire. Spot fires may occur up to 2km ahead of the fire. • There is a low chance people may die or be injured. Some homes and businesses may be damaged or destroyed. • Well prepared and actively defended houses can offer safety during a fire.
NO RATING	 6-11	**ACTION: Know where to get more information and monitor the situation for any changes.** • Fires can be controlled. Expect embers to be blown ahead of the fire. Spot fires can occur close to the main fire. • Loss of life is highly unlikely and damage to property will be limited. • Well prepared and actively defended houses can offer safety during a fire.
	 0-5	**ACTION: Know where to get more information and monitor the situation for any changes.** • Fires can be easily controlled. • Little to no risk to life and/or property.

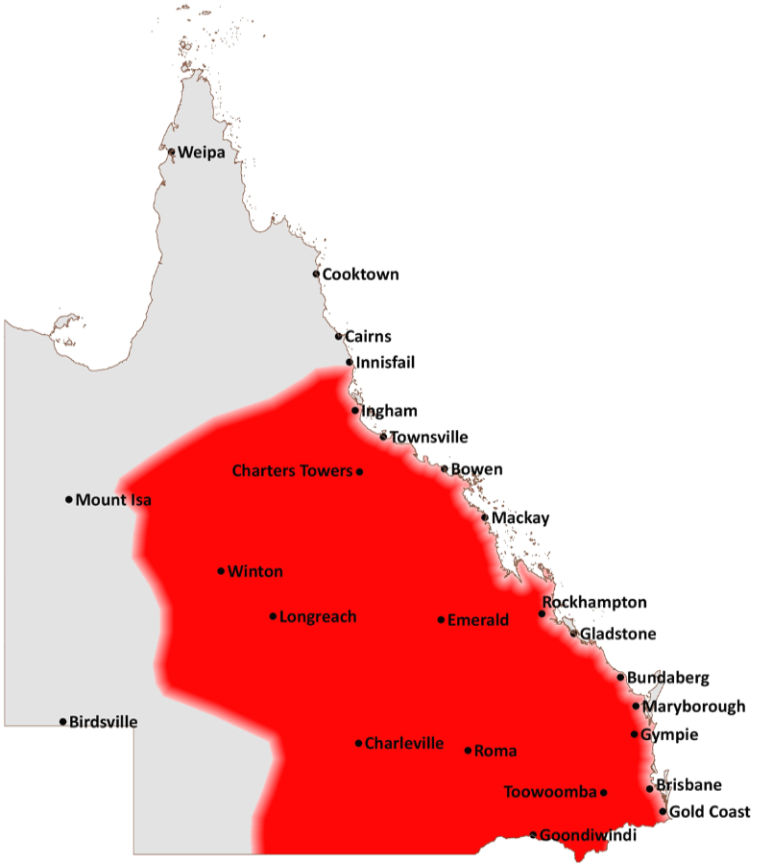
Appendix 2

Seasonal Outlook Spring 2023 (Queensland) [2]

[2] Australasian Fire and Emergency Service Authorities Council (AFAC) (23 August 2023): Seasonal Bushfire Outlook Spring 2023.

afac

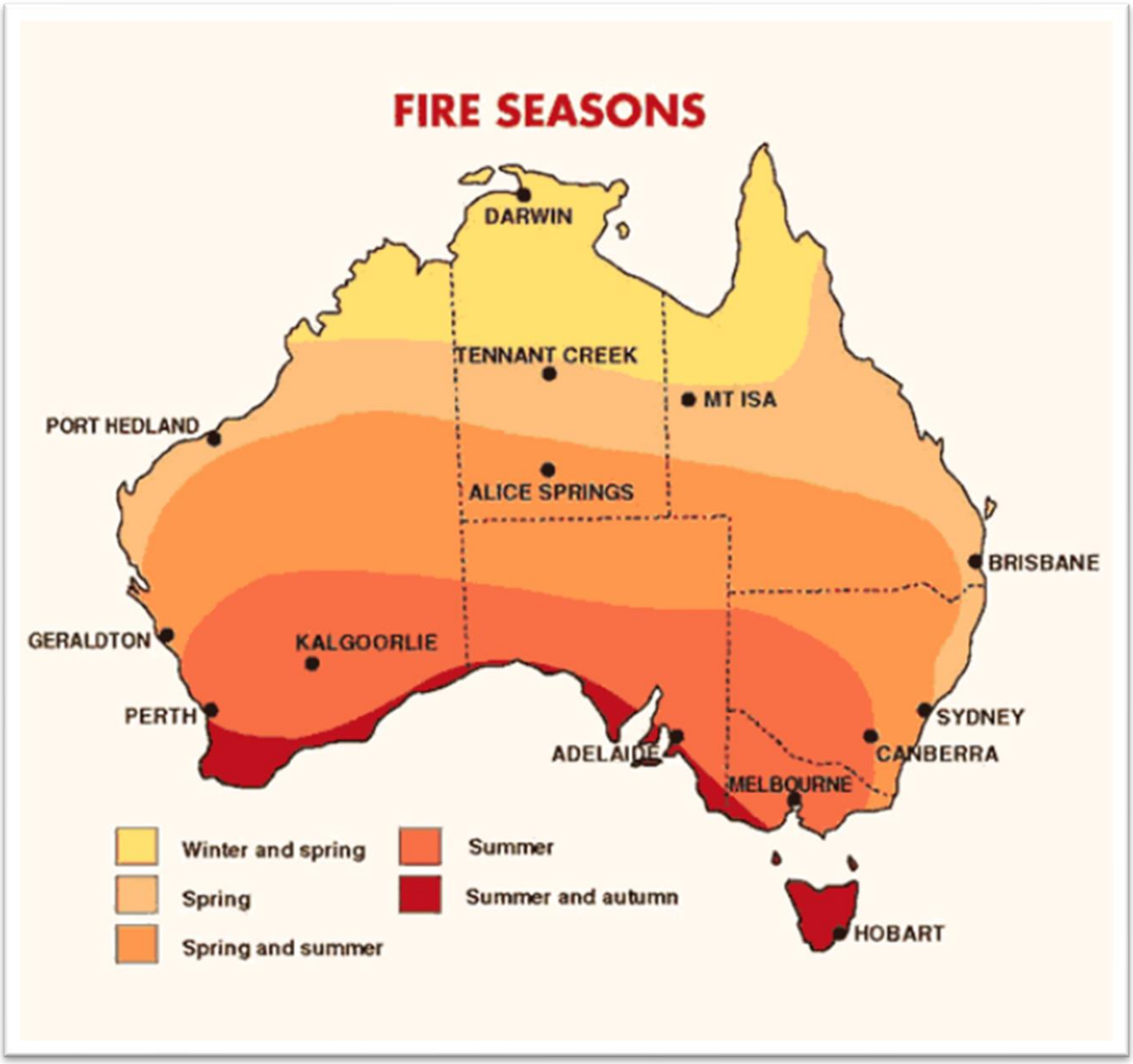
Seasonal Bushfire Outlook
Spring 2023



Appendix 3

Australian Bushfire Seasons[3]

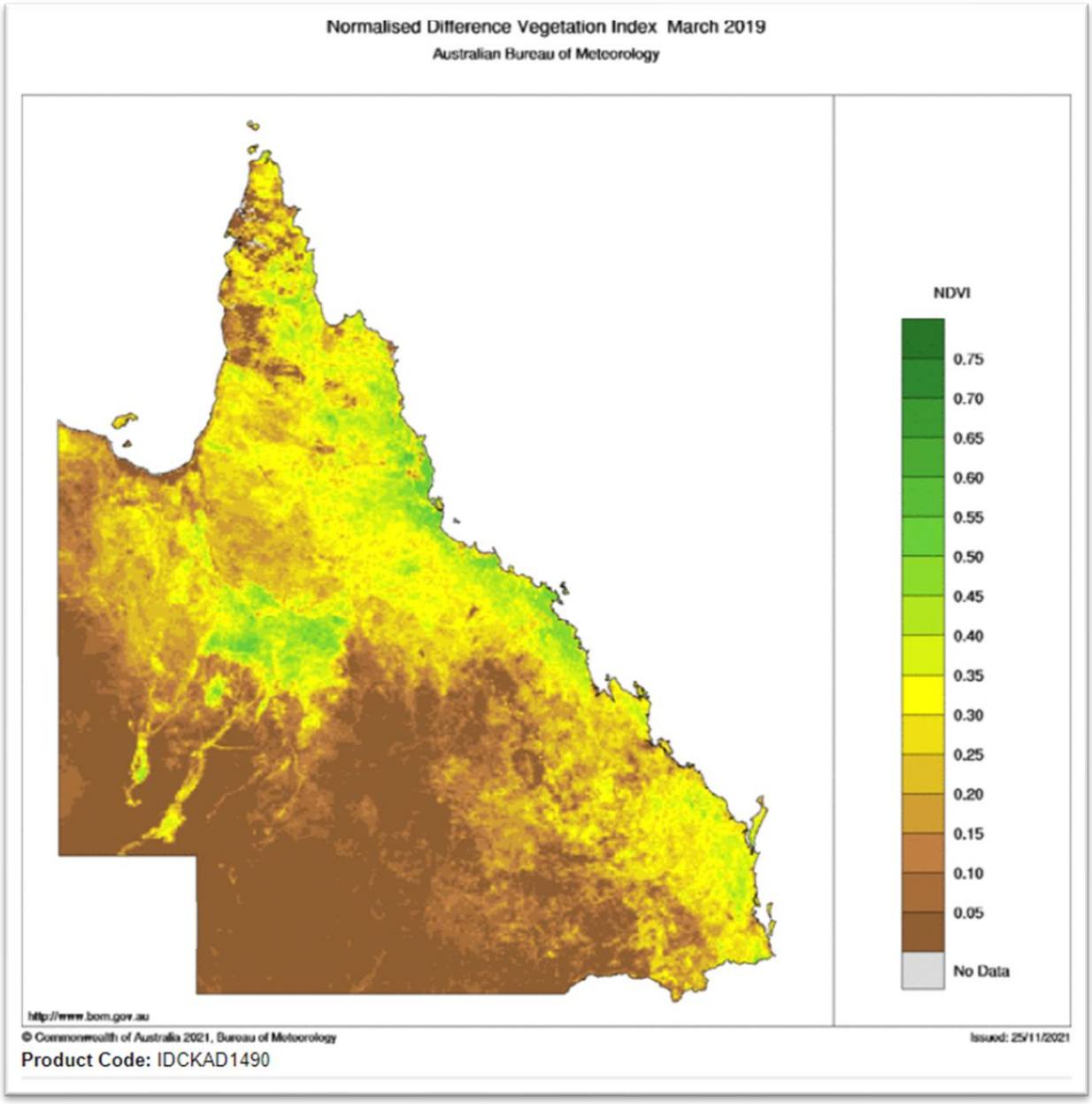
[3] Bureau of Meteorology (2 April 2013): Australia's bushfire seasons.


FIRE SEASONS
DARWIN
TENNANT CREEK
MT ISA
PORT HEDLAND
ALICE SPRINGS
BRISBANE
GERALDTON
KALGOORLIE
PERTH
ADELAIDE
SYDNEY
CANBERRA
MELBOURNE
HOBART
Winter and spring
Spring
Spring and summer
Summer
Summer and autumn

Appendix 4

Queensland 6-month vegetation Index (Greenness)[4]

[4] Bureau of Meteorology (November 2021): Archive – Monthly NDVI Average for Queensland (accessed 14/09/2023)


Normalised Difference Vegetation Index March 2019
Australian Bureau of Meteorology
NDVI
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
No Data
http://www.bom.gov.au
© Commonwealth of Australia 2021, Bureau of Meteorology
Issued: 25/11/2021
Product Code: IDCKAD1490

Appendix 6

Site Water Management and Monitoring Plan

ENGENY
WATER MANAGEMENT

SIBELCO

Sibelco

Miles Bentonite Mine

Site Water Management and Monitoring Plan

27 July 2021

M4200_008-REP-001-1

Job no. and Project Name: M4200_008 Site Water Management and Monitoring Plan
Doc Path File: \\online.com\files\Management\Projects\M4200 Sibelco Australia Limited\M4200_008 Miles Bentonite WMP\07 Deliv\2. Report\M4200_008-REP-001-1-Water Management Plan.docx

Rev	Date	Description	Author	Reviewer	Project Mgr.	Approver
0	8/07/2021	Client Issue	Louis North	Ben Kiernan	Thomas Sheppard	Ben Kiernan
1	27/07/2021	Final	Louis North	Ben Kiernan	Thomas Sheppard	Ben Kiernan
Signatures						

Contents

List of Tables

List of Figures

1 INTRODUCTION

Sibelco Australia Limited own and operate Miles Bentonite mine and processing facility near Gurulmundi approximately 30 km north of Miles in south central Queensland. Mining activities at the site are approved under Environmental Authority EPML00382513.

Condition C2 of the Environmental Authority (EA) requires the development and implementation of a Site Water Monitoring Program. Engeny Water Management was commissioned by Sibelco to provide an updated Site Water Management and Monitoring Plan (SWMMP) for the site to comply with the EA.

1.1 SITE WATER MANAGEMENT AND MONITORING PLAN OBJECTIVES

The key objectives of the SWMMP are in accordance with Conditions C2 and DEHP guideline for water management plans:

- Identify environmental values and water quality objectives.
- Determine the source and nature of potential contaminants.
- Develop a site water balance model.
- Develop a site water management system.
- Identify potential impacts to receiving environments.
- Define management actions to minimise the risks of environmental harm to receiving environments.
- Minimise storm water discharge from site.
- Separate clean water from disturbed areas.
- Outline Erosion and Sediment Control management practices.
- Manage site water quality.
- Outline contingency procedures for emergencies.
- Develop an operational monitoring and hydrological process monitoring system.

1.2 LEGISLATIVE REQUIREMENTS

The over-arching legislation that applies to the management of water at Miles Bentonite Mine includes:

- Environmental Protection Act 1994 (Qld).
- Environmental Protection Regulation 2008 (Qld).
- Mineral Resources Act 1989 (Qld).
- Mineral Resources Regulation 2003 (Qld).
- Environmental Protection (Water) Policy 2009 (Qld).
- Water Act 2000 (Qld).
- Environment Protection and Biodiversity Conservation Act 1999 (Cwlth).

1.3 STANDARDS AND GUIDELINES

Key standards and guidelines that have been used to inform the preparation and implementation of this SWMMP include:

- Best Practice Erosion and Sediment Control (IECA 2008).
- Establishing draft environmental values, management goals and water quality objectives (DEHP 2013).
- Guideline for Preparation of Water Management Plans for Mining Activities (DEHP 2012).

1.4 PROJECT DATA

The following data was used for development of the updated SWMMP. All data was supplied by Miles Bentonite Mine unless otherwise specified:

- UAV photogrammetry survey dated November 2020.
- Aerial photography.
- Environmental Authority EPML00651713.
- Existing Site Water Management Plan (URS 2007).
- Climate data from the SILO climate database facility hosted by the Department of Science, Information Technology, and Innovation (DSITI).

2 SITE DESCRIPTION

2.1 MINING AREAS

Table 2.1 summarises the approved mine leases authorised by the Environmental Authority. Mining activities on some of leases has not yet commenced and only four mining leases will be considered in the scope of the SWMMP. These areas include:

- ML5902.
- ML5909.
- ML5907.
- ML50058.

Bentonite mining currently takes place within the on ML5909, ML5907, and ML50058. For the context of the SWMMP ML5909, ML50058, and ML5907 will be referred to as the mining area. Once mined, raw bentonite material is transported north on Gurulmundi Road to the processing plant on ML5902, herein referred to the processing facility. Due to the distance between mining and processing operations. Figure 2.1 shows the regional mapping of the mine locations.

Table 2.1: Active Mining Leases of the Miles Bentonite Mine

Mining Lease Number	Area (ha)	ML Holder	ML Expiry Date	Current Tenure Land Ownership	Environmental Authority Number
ML5907	31.94	Sibelco Australia Limited	30 Sep 2030	Sibelco Australia Limited	EPML00382513
ML5909	28	Sibelco Australia Limited	31Aug 2030	Sibelco Australia Limited	EPML00382513
ML50058	19.76	Sibelco Australia Limited	08 Apr 2039	Sibelco Australia Limited	EPML00382513
ML5902	60.25	Sibelco Australia Limited	31 May 2022	Sibelco Australia Limited	EPML00382513
ML5898	30.66	Sibelco Australia Limited	31 Mar 2038	Mark Hyslop	EPML00382513
ML5905	13.75	Sibelco Australia Limited	31 Jan 2036	Mark Hyslop	EPML00382513
ML5906	35.67	Sibelco Australia Limited	31 Jan 2036	Mark Hyslop	EPML00382513
ML5900	24.5	Sibelco Australia Limited	30 Jun 2035	D & T Steinohrt	EPML00382513
ML5901	25.11	Sibelco Australia Limited	30 Jun 2035	D & T Steinohrt	EPML00382513

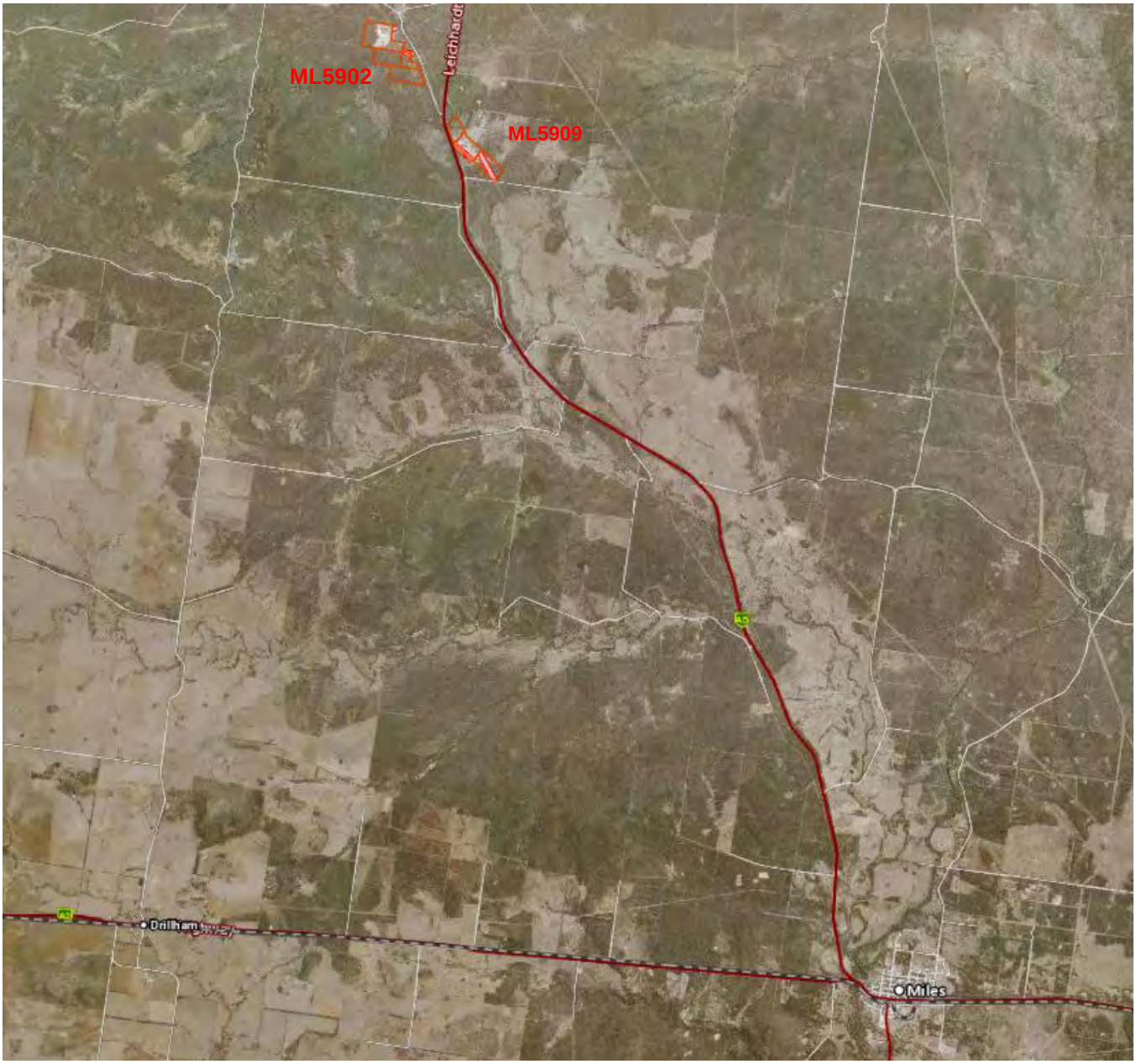


Figure 2.1: Regional Map of Miles Bentonite Mine

2.2 MINING PROCESSES

The Sibelco Australia Limited Miles Bentonite mine has been in operation since 1978. Bentonite mined at the site primarily consists of a montmorillonite clay with a high Na:Ca ratio (Sibelco 2014). Raw bentonite material is currently mined at the ML5909 mine lease and is transported to the processing facility at the ML5902 mine lease.

The mining process is a conventional free-dig open-cut typically utilising dozers and scrapers to remove topsoil and overburden and scrapers to mine and stockpile bentonite crudes. Prior to mining operations, natural vegetation was removed from ML5909 for grazing purposes, minimising the vegetation removal for mining processes. The main mining sequence has been described as Sibelco Australia Limited as (Sibelco 2014):

- Topsoil is stripped using dozers and/or scraper and utilised in rehabilitation and/or stockpiled adjacent to the current mining area.
- Overburden is stripped using dozers and scrapers and side-cast into the adjacent mining void. Overburden is shaped to provide a landform that assists rehabilitation and provides safe access for mobile plant. Some of this shaped landform is used to support operations (crudes stockpiling pads, haul roads and temporary operational/laydown areas) prior to final rehabilitation.
- Crudes are selectively mined (typically using scrapers) under geological and grade control. The mined crudes are stockpiled on an adjacent ROM pad for reclaim after the mining campaign is complete.
- Stockpiled crudes are reclaimed and transported to the plant pad on a campaign basis using a wheel loader and road trucks (e.g., side-tipping road trains).
- Rehabilitation is conducted using dozers and scrapers to shape the landform and spread topsoil. Rehabilitation proceeds concurrently with stripping of overburden.

Bentonite clay is then stored and processed at ML5902. Sibelco Australia Limited describes the method for bentonite processing as:

- Moisture removal through solar drying aided by mechanical hoeing and, where required, the addition of sodium carbonate.
- Mechanical drying, milling, and screening.
- Manual and mechanical packaging.
- Road transport from the site.

2.3 RECEIVING WATERWAYS

L Tree Creek is located east of both the processing facility and mining areas and flows in an easterly direction to Dogwood Creek (20km downstream) which is a tributary of the Condamine River within the broader Murray Darling River Basin. Unnamed tributaries of L Tree Creek traverse the mine lease boundaries, however, do not traverse disturbed areas as seen in Figure 2.2.

L Tree Creek is an ephemeral waterway with no permanent waterholes or aquatic ecosystems located near the mining lease. The upstream catchment size of L Tree Creek for mining lease ML5902 is approximately 35 km^2 with an additional 6km^2 of upstream catchment of mining tenement ML5909.

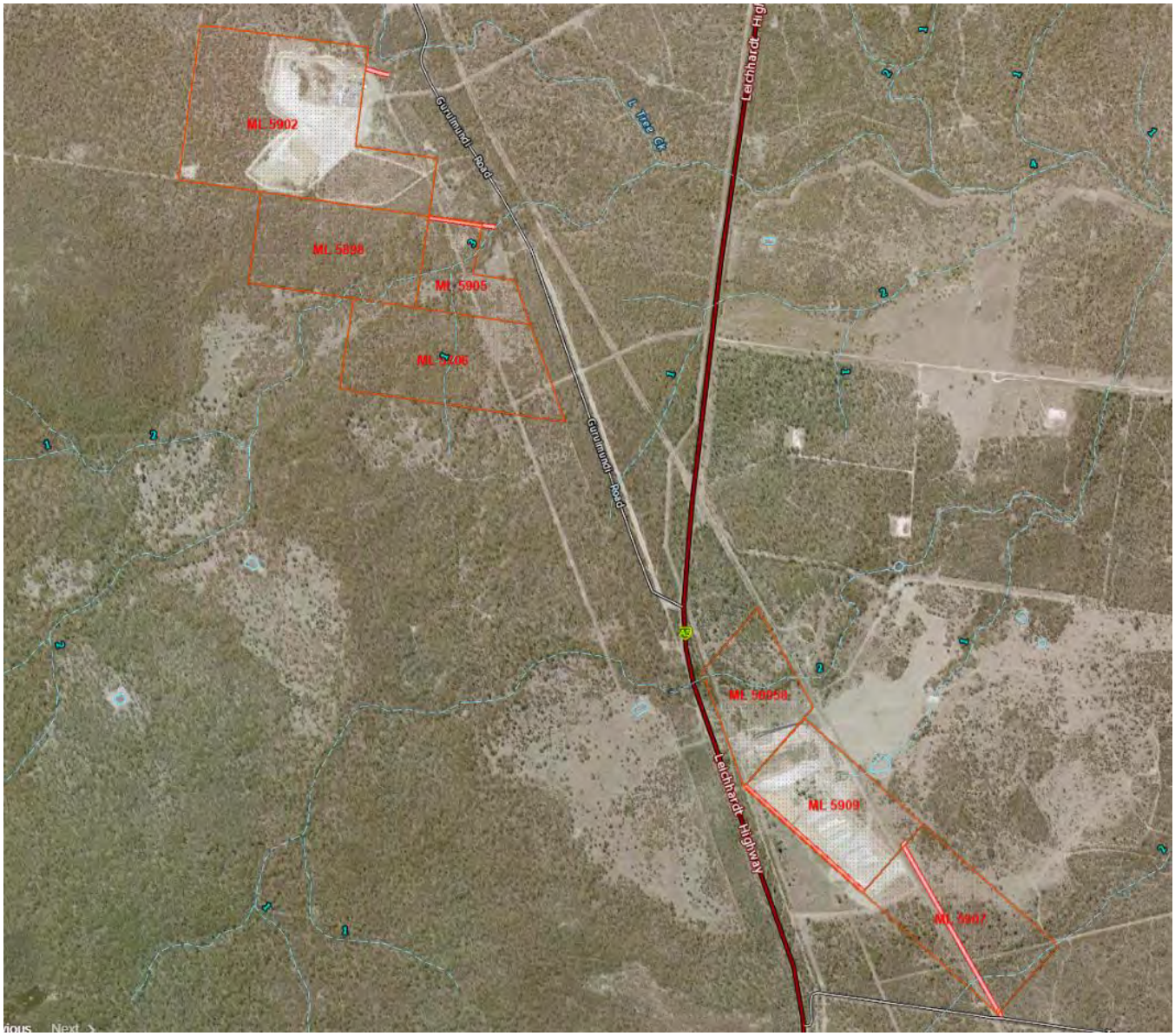


Figure 2.2: Mining Tenements and L Tree Creek

3 CLIMATE

Long term climate data for the mine was obtained from the SILO climate database facility hosted by the Queensland Department of Environment and Science (DES). A SILO Patched Point Data climate series (-26.24, 150.05) approximately equal distance between the processing facility and mining area. This point is considered to be representative of the mine's rainfall and has data ranging back to January 1900. Table 3.1 presents a summary of this dataset.

The average rainfall is 639 mm. Average evaporation from ponded water bodies at the mine is 155 mm/month, varying from 70 mm/month in June to 240 mm/month in December.

Table 3.1: Average Climate Data Statistics for Miles Bentonite Mine

Month	Mean Rainfall (mm)	Mean Pan Evaporation (mm)
Jan	90	240
Feb	77	193
Mar	60	161
Apr	36	121
May	40	86
June	39	63
July	36	67
Aug	28	91
Sept	34	122
Oct	50	163
Nov	67	181
Dec	81	204
Annual	**639**	**1695**

3.1 WATER QUALITY

Historical water quality information has been supplied by Sibelco Australia Limited for the period of 2014 to 2020. Data has been provided for sediment dams on both ML5902 and ML5909 and the water monitoring points (WMP) in L Tree Creek described by Schedule (C1-3) of the EA. Table 3.2 summarises the historical water quality of the site. Water quality information for the water monitoring points was recorded approximately once per year from 2014 to 2016 as a result of rainfall and discharge events.

Table 3.2: Miles Bentonite Mine Water Quality Summary

Location	Average PH	Total Dissolved Solids (mg/L) (average)
WMP-A	5.74	2,185
WMP-B	7.83	3,386

Location	Average PH	Total Dissolved Solids (mg/L) (average)
WMP-C	6.51	749
ML5092 SD1	7.59	10,113
ML5092 SD2	7.49	11,527
ML5092 Pit	8.03	10,707

3.2 ENVIRONMENTAL VALUES

L Tree Creek is a tributary to Dogwood Creek approximately (20 km downstream) which is part of the Maranoa and Balonne Rivers Sub-Basin. Environmental values (EVs) for Dogwood Creek have been determined by the Queensland Government (DES 2019). A summary of defined EVs are listed in Table 3.3.

Table 3.3: Receiving Waters Environmental Values.

Symbol	Environmental Value	Dogwood Creek
	Aquatic ecosystems	✓
	Irrigation	✓
	Farm or property use	✓
	Stock watering	✓
	Human consumption of aquatic foods	✓
	Primary recreation	✓
	Visual appreciation	✓
	Drinking water	✓
	Industrial use	✓
	Cultural and spiritual values	✓

3.3 WATER QUALITY OBJECTIVES

Water released into receiving waterways from stormwater, sediment dams, and process water must comply with Condition C1-3 of the EA. Receiving waterways affected by mining water must be monitored in compliance with the EA. The receiving waterway contaminant release limits for L Tree Creek are:

- pH 6.0 to 8.0.
- Total Dissolved Solids < 4000 mg/L.
- Sulphate < 1000 mg/L.
- Calcium < 1000 mg/L.
- Magnesium < 600 mg/L.

Condition C1-4 of the EA states that in the event sediment dam water quality does not comply with the described release limits, measures must be implemented to prevent access by livestock and minimise access by fauna.

4 CONTAMINANT SOURCES

Surface water runoff from mine landforms and disturbed areas can potentially contain a variety of contaminants including sediment, heavy metals, hydrocarbons, and soluble salts. Potential contaminant sources identified across Miles Bentonite Mine include:

- Tailings storage pits (prior to rehabilitation).
- Overburden dumps.
- Processing facility including chemical and diesel storage locations.
- Haul roads and access roads.
- Pit voids.
- Water containment and sediment dams.
- Cleared areas.

This SWMMP addresses the overarching management of water across the mine site, focusing on managing water in distinct categories including:

- Mine Affected Water – Water that contains contaminants which have been generated as a result of the extraction and processing, such as soluble salts, dissolved metals and hydrocarbons.
- Sediment Water – Rainfall runoff in which the only contaminants are dissolved or suspended sediments.
- Clean Water – Rainfall runoff generated from areas not impacted by activities associated with the approved mining.

5 WATER MANAGEMENT SYSTEM

The water management systems at Miles Bentonite mine comprises of storages which serve the following purpose:

- Active or abandoned mine pits (voids).
- Storage of mine affected water.
- Sediment control.
- Diversion of clean run-off.
- Pit dewatering pumps and transfer systems.

Figure 5.1 displays the water management system schematic for the Miles Bentonite processing site (ML5902) and Figure 5.2 displays the water management system schematic for the Miles Bentonite mining (ML5909) area. The schematics shows water management infrastructure used on site including mine affected water storages, sediment dams, pipelines, and drains. Maps showing the locations of storages are included in Appendix A.

The majority of mine affected water is internally drained to the voids at each Mining lease. Mine affected water not internally drained to a Void is captured by sediment dams.

The water management system also includes an interconnecting pipe network with associated pumps which allow mine affected water to be transferred between water storage structures across the site. Bunding and levee systems are also present to divert clean water run-off from entering mine affected areas.

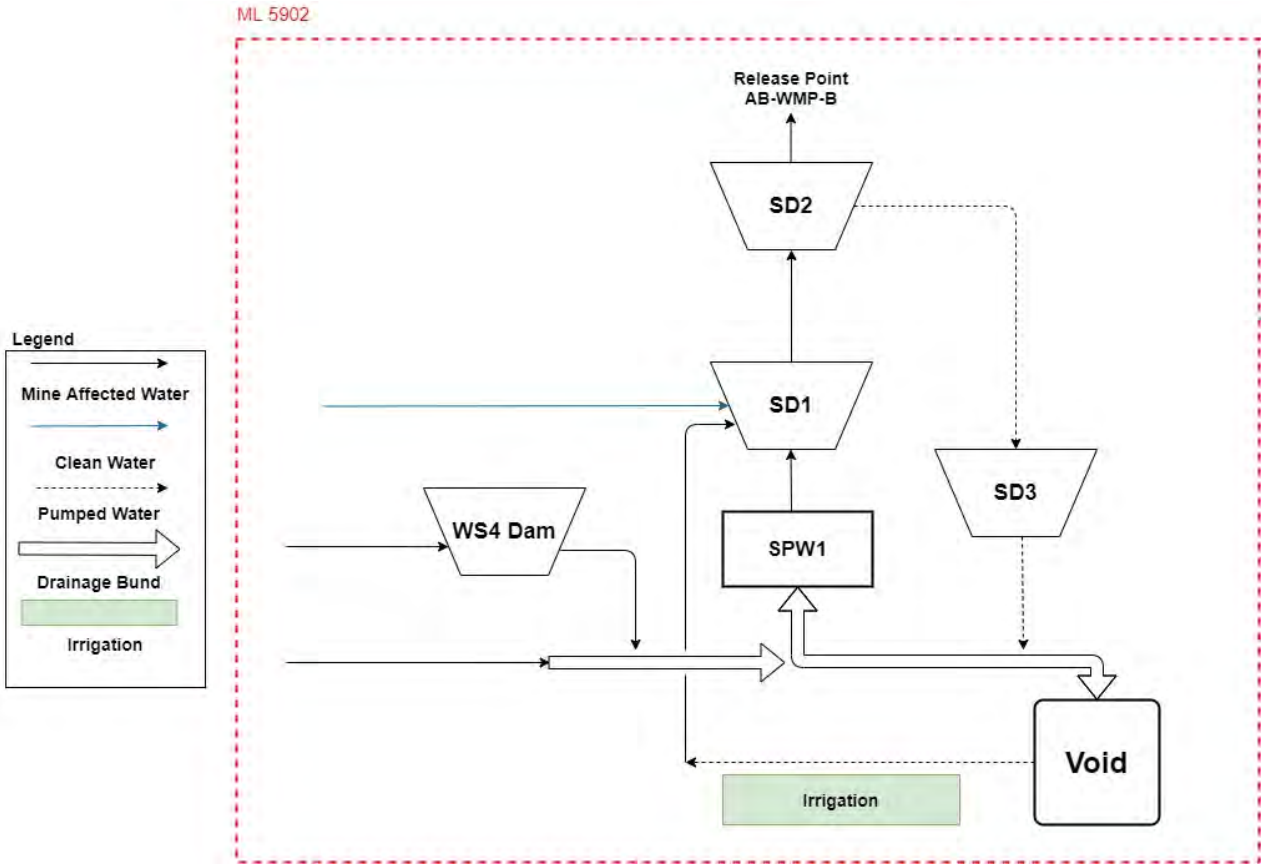


Figure 5.1: Processing Facility Water Management System Schematic

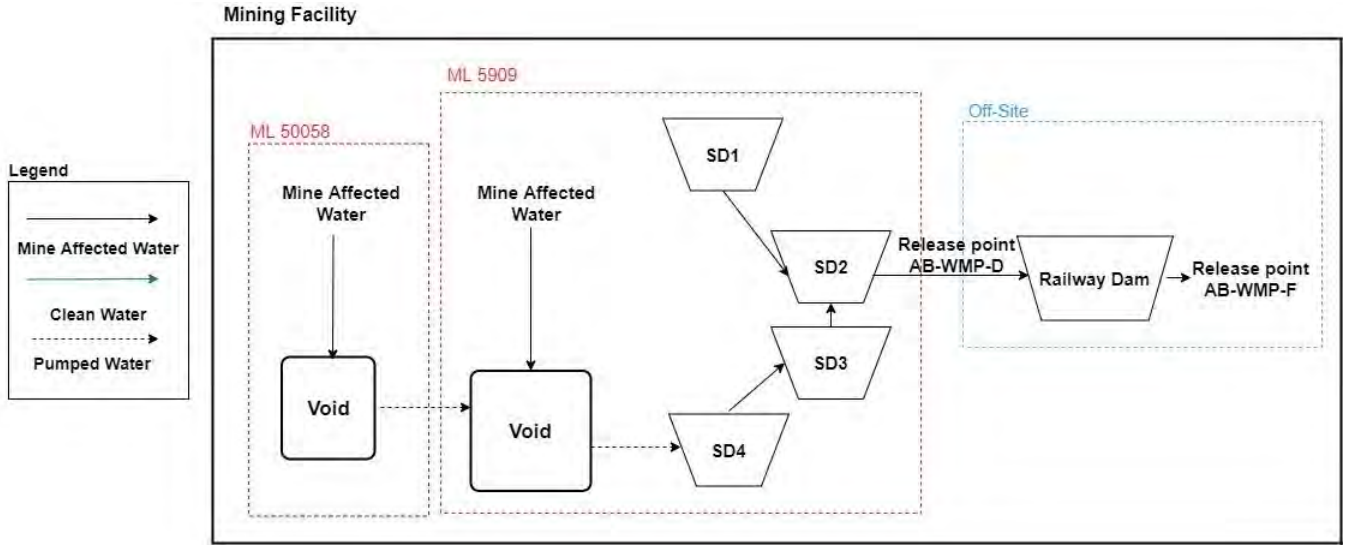


Figure 5.2: Mining Facility Water Management System Schematic

5.1 WATER MANAGEMENT OBJECTIVES

Table 5.1 summarises the types of water on site and the management strategy employed for each type.

Table 5.1: Overall Water Management Strategies

Type of Water	Definition	Management Strategy
Clean Runoff	Runoff from all areas that are not affected by mining or operational facilities	Levees and drains and dams are used to keep clean water separate and ultimately divert clean catchment runoff to receiving waterways.
Sediment Runoff	Runoff in which the only contaminants are dissolved or suspended sediments.	Runoff with a sediment load is directed through sediment control structures to minimise solid content prior to exiting the site.
Mine Affected Water	Includes any water that comes into contact with processing, surface or groundwater that is intercepted during the mining process.	Objective is to keep this water separate from the other water types, recycle and evaporate as much as possible and discharge as per EA release conditions.

The design and details of the clean water runoff and sediment runoff systems is outlined in the Erosion and Sediment Control Plan (Section 7).

5.2 WATER MANAGEMENT INFRASTRUCTURE

5.2.1 Mine Water Storages

The main dedicated mine water storages for both the processing and mining facility are the mined voids. The processing facility (ML5902) utilises one large pit void as the primary storage. Water can be transferred from this void to smaller site storages to mitigate overflow. Previous studies conducted by Sibelco Australia Limited estimated the total storage capacity to be approximately 90 ML, however, no information has been provided regarding how this result was obtained (Sibelco 2015). Storage capacity was estimated from a November 2020 aerial survey; however, a large volume of water was present in the dam during

this time. Due to this, the 90ML estimation provided by Sibelco will be adopted as the storage volume. It is recommended a bathymetric survey be undertaken to improve accuracy.

The processing facility also contains a small storage dam to capture water from around the mine industrial area (MIA) outside of the main drainage areas. No information currently available to estimate the capacity of this storage dam.

The mining area (ML5909) utilises three pit voids as the primary mine water storage. These pits are independent of each other and other water storage systems on site, lacking distinct drainage features to transfer water. Mine affected water is able to be pumped from between storage voids and sediment dams using mobile pumping systems. From an aerial survey conducted November 2020, the maximum site storage across all voids was estimated to be approximately 355 ML. Given this estimation was calculated with interpolation of the aerial survey, these storages are likely to have a larger capacity due to some storages containing water. It's recommended a bathymetric survey be undertaken to improve accuracy.

5.2.2 Sediment Dams

A series of sediment dams are used across both the processing and mining facility for sediment capture and water storage. Information is not currently available to accurately determine the existing storage capacity or inflows of the sediment ponds as survey does not include details below the standing water level at the time of survey.

Sediment dams at the processing facility transfer mine affected water from site via transfer pipes. Water from the site flows into Sediment Dam 1, which then transfers into Sediment Dam 2. Sediment Dam 2 acts as a release point, discharging water into L Tree Creek from a steel outlet pipe. To mitigate release of water from Sediment Dam 2, water can be transfer to Sediment Dam 3.

On the mining area (ML5909) water can be pumped from the southern storage dam to Sediment Dam 4. Sediment Dam 4 then transfers to Sediment Dam 3 then Sediment Dam 2. Sediment Dam 1 transfers to Sediment Dam 2 by overflowing and draining into Sediment Dam 2. Mine affected water is discharged from site to an off-site raw water storage pond (Railway Dam) using transfer pipes from Sediment Dam 2. Water is then released into L Tree Creek from the Railway Dam.

5.2.3 Clean Water Diversions

Exclusively in the processing area, a large bunded channel is used to transfer mine affected water to the storage void. This system is referred to on site as the moat. Once the void has reached capacity, water backs within up the moat to a spillway dam. During this occurrence, the moat acts as additional storage for the void.

Bunding and levees are present around the perimeter of the voids and disturbed areas to divert clean run-off away from mine affected areas.

5.2.4 Water Transfers

The overall pumping strategy and transfer options are illustrated in the Mine Water Management Schematics in Figure 5.1 and Figure 5.2. Pumps and pipelines are used at the processing facility to transfer water between storages. Mine affected water is pumped from Sediment Dam 2 to Sediment Dam 3 and Sediment Dam 3 to the storage void. A third pump is also used to dewater the storage void by transferring water to the adjacent clean water catchment on the mining lease which reports to Sediment dam 1.

Water also irrigated directly from the storage void onto land directly to the west of the void to actively manage site water inventory. Excess water from the irrigation process drains via an existing drainage line to Sediment Dam 1.

5.2.5 Mine Water Release Infrastructure

There are two release points for the Miles Bentonite mine designated in the EA, one for the processing facility (ML 5902) and one for the mining facility (ML 5909). At ML 5902, mine affected water is released from Sediment dam 2 via a steel outlet pipe into L Tree Creek. At ML 5909 mine affected water is released from the lease boundary via a channel out of Sediment dam 2 into the Railway Dam located off-site.

6 SITE WATER BALANCE

6.1 OVERVIEW

The site water balance allows the performance of the water management system to be simulated for a range of potential future climate scenarios. Key performance indicators include mine water accumulation and water release volume.

6.2 WATER INFLOWS

6.2.1 Catchment Runoff

Catchment runoff has been simulated using the Australian Water Balance Model (AWBM). A schematic representation of the AWBM model is provided in Figure 6.1. The model represents the catchment using three surface stores to simulate partial areas of runoff. The water balance of each surface store is calculated independently of the others. The model calculates the water balance of each partial area at daily time steps. At each time step, rainfall is added to each of the three surface stores and evapotranspiration is subtracted from each store. If the value of water in the store exceeds the capacity of the store, the excess water becomes runoff. Part of this runoff becomes recharge of the baseflow store if there is a baseflow component to the stream flow.

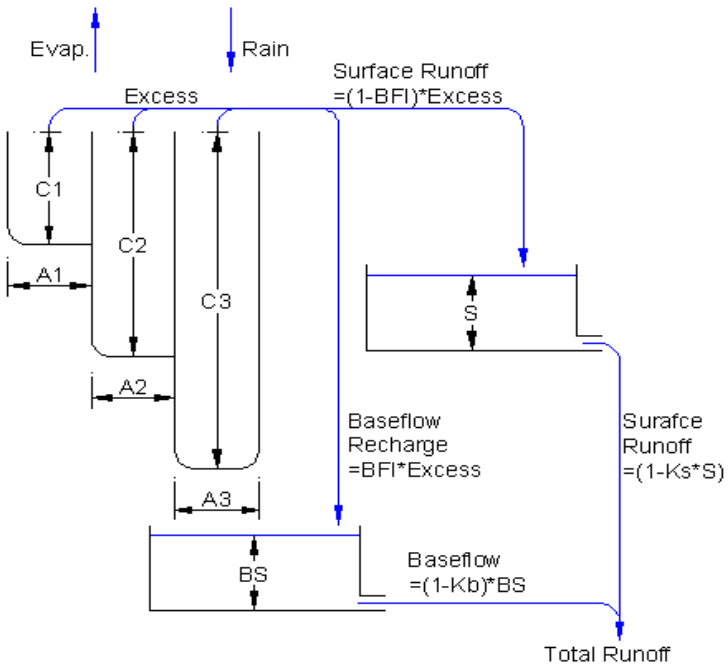


Figure 6.1: AWBM Schematic

AWBM natural land use catchment runoff parameters have been adopted from parameters calibrated in a previous study for the Catchment (WRM 2018). The adopted parameters for the AWBM model are listed in Table 6.1. In the absence of calibration information, these parameters are consistent with the runoff parameters adopted for industrial and mining area land uses.

Table 6.1: Adopted AWBM Parameters

Parameter	Value
Partial Area A1	0.1
Partial Area A2	0.9
Partial Area A3	-
Soil Store C1	12
Soil Store C2	38
Soil Store C3	-
Baseflow Index (BFI)	0
Baseflow Recession Constant (Kb)	1
Baseflow Recession Constant (Ks)	0

Daily rainfall data for the AWBM calibration was acquired from a SILO Patched Point Data climate series (-26.24, 150.05), approximately equal distance between the mining area and processing facility.

6.2.2 Evaporation

Lake evaporation rates for Miles Bentonite Mine have been extracted from the SILO Patched Point Data described above and are summarised in Figure 6.2. Mean annual evaporation from ponded water bodies at Miles Bentonite Mine is 1695 mm/yr while daily rates vary from 2.1 mm/day in June to 6.6 mm/day in December.

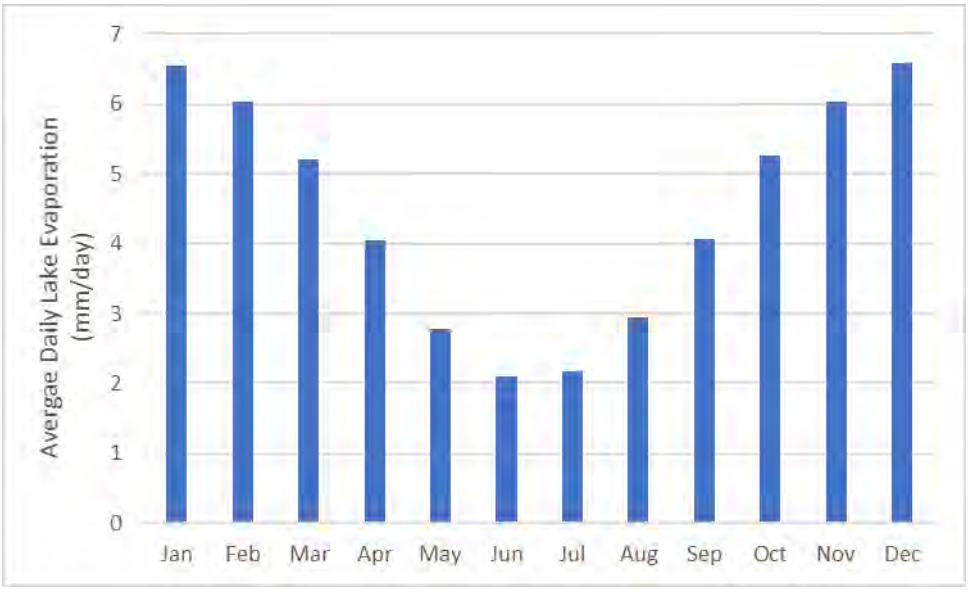


Figure 6.2: Average Daily Evaporation

6.2.3 Operational Water Consumption

There is no current operational use of water on-site water inputs and outputs are provided by rain fall and evaporation on site.

6.2.4 Water Release Capacity

Water is not actively released from sites, however water is actively irrigated on lease. Due to the uncertainty associated with actual net loss rates from irrigation this has been conservatively excluded from the assessment.

6.3 WATER BALANCE MODEL

Two simplified water balance model for the Miles Bentonite Mine have been developed using a spreadsheet model. One the processing facility (ML5209) and mining area (ML5909). These models were specifically developed for the purposes of determining the EA storage compliance of the voids for each site. Schedule C Table 4 of the EA requires the storage capacity of the storage allowance of the void to be equivalent to the run-off from a >1:100 AEP wet season. Sediment dams have been excluded from the water balance model due to a lack of information on storage characteristics.

To determine this, 120years of recorded data was applied to the Mine's water balance model to determine if any overflow occurred during this period. The results of the two water balance models are summarised below in Table 6.2.

Table 6.2: Water Balance Model Results

Modelled Area	Maximum Storage Capacity	Maximum Volume	Total Overflow	Total Water Years with Overflow	Average Annual Inflow	Average Annual Outflow
	ML	ML	ML	-	ML/yr	ML/yr
Processing facility ML5902	90.5	111.1	120	17	26,559	26,330
Mining area ML5909	355.9	421	3109	47	254,521	252,847

The processing facility was estimated to overflow in 17 water years, while the mining facility was estimated to overflow in 47 water years over a 120-year simulation period. These results demonstrate the storage voids on both sites do not comply with the requirements outlined in Schedule C Table 4 of the EA.

Figure 6.3 and Figure 6.4 show the percentage of years exceeding any overflow to be approximately 13% for the processing facility and 39% for the mining area. Further information is required to understand storage characteristics by way of bathymetric survey to confirm accuracy of these results.

The current containment requirements for the voids are nominated at a 1:100 AEP level of containment which is considered onerous in the context of more contemporary EAs and current regulatory requirements. Under current mining EAs the sediment dam containment levels would be nominated by way of a consequence category assessment as per the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures. If a consequence category assessment were to be completed it is likely that level of containment required would be 1:20 AEP or less. This is due to the water quality and potential for environmental harm however would need to be confirmed through a certified consequence category assessment. Based on the water balance modelling completed it is likely the systems would comply with these requirements. It is recommended that an EA amendment be completed to bring the conditions in line with contemporary requirements.

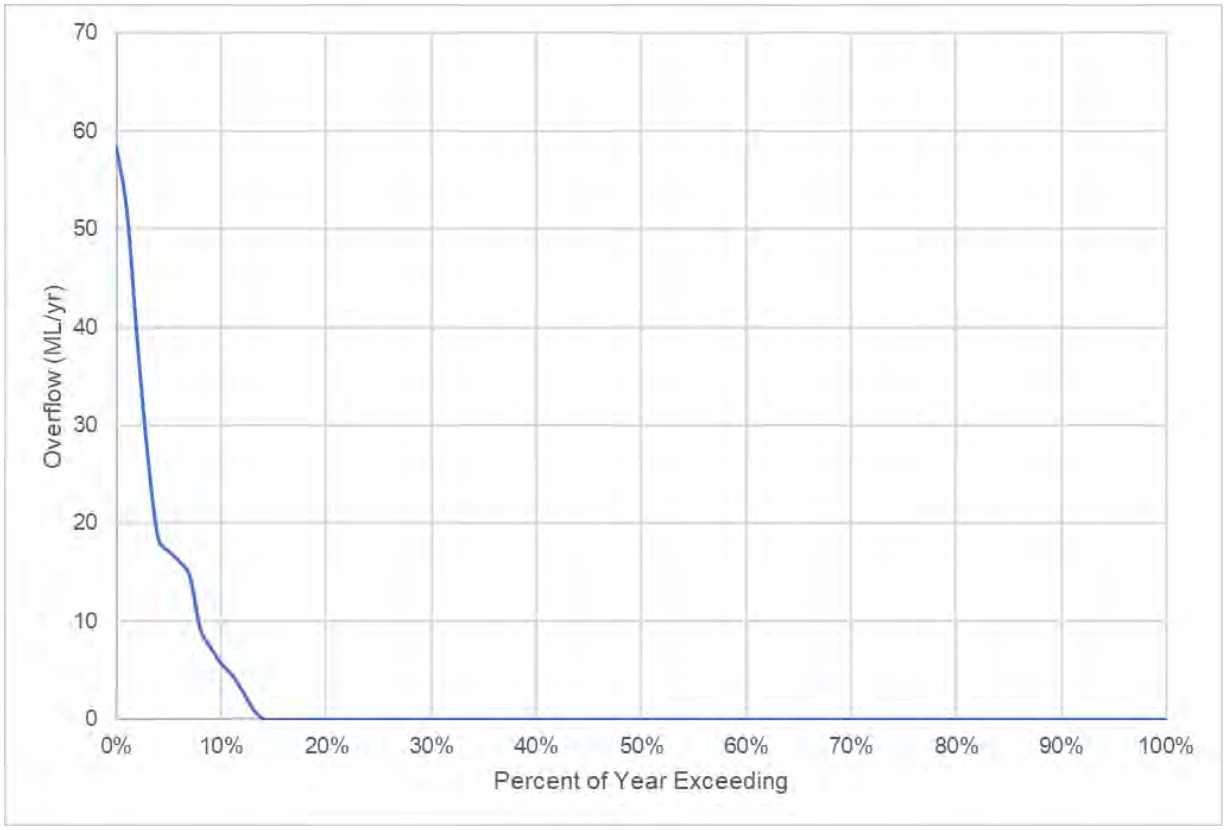


Figure 6.3: Processing Facility (ML5902) Overflow Exceedance Probability

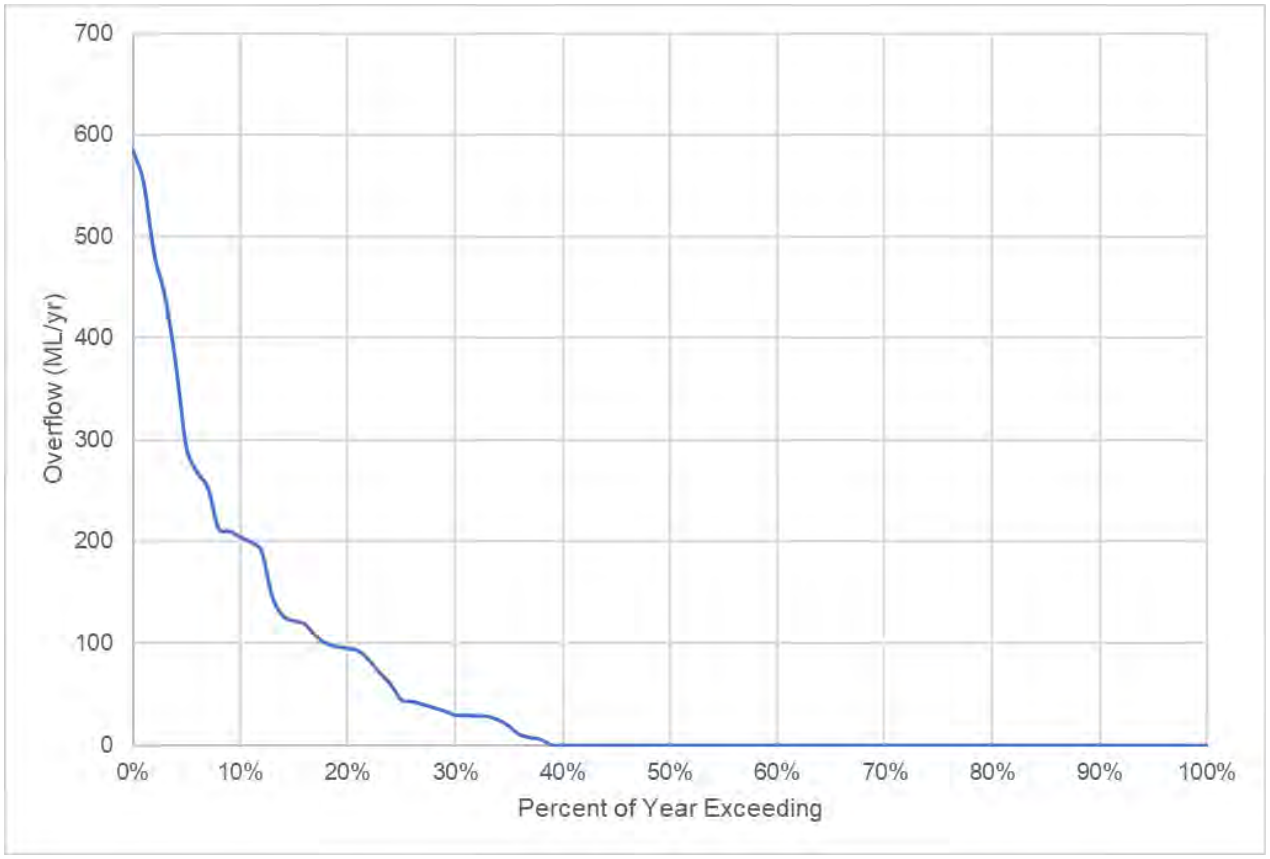


Figure 6.4: Mining Facility (ML5909) Overflow Exceedance Probability

7 EROSION AND SEDIMENT CONTROL PLAN

The majority of the disturbed areas at Mile bentonite Mine are located and contained inside the internal drainage systems of the mine site. As a result, there are limited areas with exposed soils and the main mechanism for transport of sediment offsite is erosion within existing drainage structures. The following sections outline the measures and ongoing operational requirements for erosion and sediment control which have been developed in accordance with the Best Practice Erosion and Sediment Control (IECA, 2008). This Erosion and Sediment Control Plan is intended to meet the requirements of conditions Schedule C7 of the EA.

7.1 PRINCIPLES

The following principles provide the foundation for the Mile Bentonite Mine Erosion and Sediment Control Plan:

- Minimise surface disturbance and restrict access to undisturbed areas.
- Progressively rehabilitate and stabilise disturbed areas with vegetation.
- Separate catchment runoff from disturbed and undisturbed areas where practicable.
- Reduce potential for erosion through velocity controls and reduced runoff volume.
- Use of suitably sized and protected drainage structures to manage surface runoff.
- Use of existing onsite containment structures for the capture of sediment laden surface water runoff.
- Regular monitoring and maintenance to ensure continual operation of the individual erosion and sediment control elements.

7.2 EROSION AND SEDIMENT CONTROL PLAN

7.2.1 Performance Criteria

The following performance criteria are required to be met in relation to erosion and sediment control:

- Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters or cause a material build-up of sediment in such waters.
- Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment and contamination of storm water.
- The maintenance and cleaning of vehicles and any other equipment or plant must not be carried out in areas from which contaminants can be released into any receiving waters.

7.2.2 Erosion and Sediment Control Infrastructure

A summary of the requirements associated with the operation of this infrastructure is provided in Table 7.1.

Table 7.1: Erosion and Sediment Control Infrastructure Elements

Infrastructure Element	Sediment Source	Design Criteria
Sediment Dams	Rehabilitated areas, exposed surfaces and roads	Sediment basins typically design to contain 1:1 AEP 5 day 90th percentile storm volume. However, the existing dams provide a dual function to manage mine affected water with release limited by pumping capacity to the pit
Levees	Rehabilitated areas and exposed surfaces	Levees are designed, monitored and maintained to provide flood immunity to the operation and prevent the inflow of clean water that could mobilise sediment to downstream receiving waterways.

7.2.3 Erosion and Sediment Control Operational Requirements

The following operational requirements should be provided in conjunction with the existing infrastructure elements to manage erosion and sediment control:

- The extent of disturbance (including trafficable areas) is minimised and identified using barriers and signage.
- A combination of temporary and permanent measures may be necessary for any disturbance associated with new construction and/or rehabilitation works.
- Runoff from undisturbed catchments is diverted around the disturbance areas via diversion drains and banks to discharge into natural watercourses, where practicable.
- All erosion and sediment control measures are to remain in place until exposed areas are successfully rehabilitated and stabilised.

7.2.4 Monitoring and Inspection

Monitoring and inspection of erosion and sediment control infrastructure is to be undertaken in accordance with the following requirements:

- Erosion and sediment controls (dams, levees, and canals) to be inspected after significant rainfall events.
- Monitoring of surface water discharge quality in accordance with the requirements of the EA.
- Levees are to be inspected at least annually prior to the wet season to ensure the integrity of the system is maintained.

7.3 ONGOING REQUIREMENTS

Any future site works that have the potential to generate sediment through exposed surfaces may require additional sediment control infrastructure and operational procedures. These works may include but are not limited to:

- Construction of new levees or major maintenance to existing levees.
- New access road construction.
- Opening of new mining areas.

Table 7.2 outlines the trigger for the implementation of additional temporary erosion and sediment controls that may be required in the future at Mile Bentonite Mine. Large scale works may require specific erosion and sediment control plans to be prepared as part of the detailed design of these works.

Table 7.2: Requirements for Ongoing Erosion and Sediment Control Works

Works	Design	Indicative Works Required	Design Life
Levee Works	Project specific erosion and sediment control plan to be prepared as part of design	• Sediment basin • Dirty water catchment drains • Topsoil placement to finished surface for vegetation growth	To be implemented and maintained until revegetation is established
Opening of new mining areas	Project specific erosion and sediment control plan as part of design	• Sediment basin • Levee construction • Dirty water catchment drains • Topsoil placement to finished surface for vegetation growth	To be implemented and maintained until revegetation is established
Road Construction	None	Sediment fences Clean water diversion drains Formalised longitudinal and cross drainage	<6 months

8 MONITORING PLAN

This section outlines procedures which are required to meet the water quality objectives outlined in Section 3.3.

8.1 WATER MONITORING LOCATIONS

Schedule C of the EA details monitoring requirements for the receiving waters of L Tree Creek. The location of the monitoring points and frequency of monitoring are shown in Table 8.1. In addition to the required monitoring points, water management infrastructure is also monitored. Descriptions and locations of monitored mine water infrastructure are shown in Table 8.2. No specific sampling frequency requirements of the water management infrastructure are detailed in the EA, so sampling frequency guidelines shown in Table 8.2 have been adopted.

Table 8.1: EA Schedule C Required Monitoring Locations

Monitoring Point	Location	Easting (m)	Northing (m)	Monitoring Frequency
AB-WMP-A	50m upstream of AB-WMP-B ML5902 outlet in L Tree Creek	205,919	7,074,389	Every 3 months if flowing and in the event of release/overflow to waters
AB-WMP-B	At ML5902 outlet point in L Tree Creek	205,798	7,074,300	In the event of release/overflow to waters
AB-WMP-C	50m upstream of AB-WMP-B ML5902 outlet point	206,108	7,074,299	Every 3 months if flowing and in the event of release/overflow to waters
AB-WMP-D	ML5909 Outlet	208,077	7,071,159	In the event of release/overflow to waters
AB-WMP-E or AB-WMP-F	ML5909 Sediment Dam Or ML5909 Outlet	208,216	7,071,095	Every 3 months if flowing and in the event of release/overflow to waters

Table 8.2: Site Infrastructure Monitoring Locations

Locations	Easting (m)	Northing (m)	Monitoring Frequency
ML5902 SD1	205,733	7,074,305	Every 3 months if flowing and prior to release/overflow into receiving waters
ML5902 SD2	205,545	7,074,278	Every 3 months if flowing prior and to release/overflow into receiving waters
ML5902 Void	205,585	7,074,738	Every 3 months if flowing prior and to release/overflow into receiving waters

8.2 WATER QUALITY MONITORING METHODOLOGY

8.2.1 Field Notes

To assist in the interpretation of water quality results at the end of a sampling event, a record sheet must be used to recording in-situ water quality measurements and general visual observations when sampling is being undertaken. The general observations that should be listed are:

- Sampling location.
- Time of sampling.
- A description of climatic conditions at the time of sampling (e.g. light, moderate, heavy, or no rainfall). Could cover present at the time and presence of wind including direction.
- Water flow (ponded/flowing) including estimated depth.
- Appearance of water, including colour.
- Presence/condition of vegetation.
- Presence of erosion within the waterway or structure.

8.2.2 In-Situ Water Quality Monitoring

A water quality meter is required to measure in situ water quality measurement for each location. The instrument must have the capacity to measure pH, temperature, electrical conductivity (EC), and turbidity.

Before a sampling event, the instrument must undergo calibration checks before measurements are recorded. The results of calibrations should be noted for each sampling event. Water quality probes must be allowed sufficient time for readings to stabilize before recording. Between each sampling location, the instrument must be clean with deionized water and dried with blotting paper to mitigate cross-contamination.

8.2.3 Sample Collection and Preservation

Unique sample labels must be added to each sample using a waterproof method. The date, time, sample location, and number must all be present on the label. Grab sampling is appropriate for site; however, sampling methods will vary given the parameters of the location such as depth and access to location. Recommended methodologies of sampling site parameters are as follows:

- Depth: samples should be taken at and appropriate depth (minimum 0.3m) while ensuring sediment isn't disturbed. In the event of shallow water, a large disposable syringe must be used to transfer water.
- Access Restrictions: A clean rod and clamp maybe be used to hold containers, in location where access is difficult.

All samples must be supplied to a National Association of Testing Authorities (NATA) accredited laboratory. The laboratory preservation requirements should be determined prior to a sampling event and dispatch. Preservation requirements of samples will vary depending on the contaminants being measured.

Before delivery to a laboratory, all samples will need to be stored at a low temperature using and insulted container ('Esky') filled with crushed or boxed ice. Caution must be taken to avoid breakages or leakage with the containers.

8.2.4 Quality Control

One quality control sample is to be collected during each sampling event. This sample is required by the laboratory to assess the accuracy of the data set. The quality control sample will be a duplicate of an existing sample, collected by distributing one sample between two separate contains. The quality control sample must be labeled independent of the dataset and the laboratory must not be informed of the identification of the duplicate and source container.

9 EMERGENCY AND CONTINGENCY PLANNING

Emergency contacts nominated by Sibelco Australia Limited should be contacted in case of any emergency conditions associated with the water management system.

The following specific emergency response plans have been developed to assist Sibelco in planning for specific incidents. These procedures are to be referred to regularly as preventative measures and also in cases of events occurring which impact on the normal operation of the site water management systems. These emergency response plans are in addition to the Miles Bentonite mine Emergency Response Procedure.

9.1 HIGH INTENSITY RAINFALL EVENTS

Table 9.1: Emergency Response Plan for High Intensity Rainfall Events

High Intensity Rainfall Emergency Response Plan	
Policy	To limit the potential for environmental impacts within the Mile Bentonite Mine receiving waters as a result of contaminated overflows from onsite water containment structures. Due to exceedance of rainfall characteristics (intensity and duration) that exceed the performance characteristics of water management infrastructure.
Objectives	To take the necessary precautionary measures to manage infrastructure and related activities to prevent environmental harm caused by high (intensity and duration) rainfall events. All operation, maintenance and monitoring of water management infrastructure is to be undertaken in accordance with this Water Management Plan
Controls	Operation of dams at low levels to provide sufficient storage prior to the commencement of the wet season. Wet weather access is maintained to pump infrastructure for starting of diesel pumps, delivery of fuel, repairs and inspections. Electrical pumps are maintained and functioning correctly, and standby diesel pumps have sufficient fuel supply to ensure continued operation.
Monitoring	The Site Superintendent is responsible for regular inspections and routine maintenance of water management infrastructure. Inspections to be undertaken after high rainfall events to ensure there are no visible signs of erosion or damage to infrastructure.
Corrective Action	All corrective actions will be managed through site inspection procedures. All incidents and corrective actions resulting from audits and inspections are to be recorded.

9.2 INABILITY TO ACCESS CRITICAL CONTROL AND MONITORING POINTS IN ALL WEATHER CONDITIONS

Table 9.2: Emergency Response Plan for Inability to Access Critical Control and Measuring Points in all Weather Conditions

Inability to Access Critical Control and Monitoring Points Emergency Response Plan	
Policy	To limit the potential for environmental impacts within the Mile Bentonite Mine receiving waters due to lack of access to pumps and monitoring locations.
Objectives	To take the necessary precautionary ensure monitoring and control equipment is maintained and operable to prevent system failure or inability to monitor and report potential impacts. All operation, maintenance and monitoring of water management infrastructure is to be undertaken in accordance with this Water Management Plan.
Controls	Routine grading of access roads to critical control sites and monitoring infrastructure. Means of accessing the pumping infrastructure including the use of boats or helicopters when required. Use of solar powered monitoring equipment including regular servicing and calibration.

Inability to Access Critical Control and Monitoring Points Emergency Response Plan

Monitoring	Annual monitoring and calibration of monitoring equipment. Inspection of control equipment and access roads prior to commencement of the wet season.
Corrective Action	All corrective actions will be managed through site inspection procedures. All incidents and corrective actions resulting from audits and inspections are to be recorded.

10 QUALIFICATIONS

a) In preparing this document, including all relevant calculation and modelling, Engeny Water Management (Engeny) has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.

b) Engeny has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and document is as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.

c) Engeny reserves the right to review and amend any aspect of the works performed including any opinions and recommendations from the works included or referred to in the works if:

   i) Additional sources of information not presently available (for whatever reason) are provided or become known to Engeny; or
   ii) Engeny considers it prudent to revise any aspect of the works in light of any information which becomes known to it after the date of submission.

d) Engeny does not give any warranty nor accept any liability in relation to the completeness or accuracy of the works, which may be inherently reliant upon the completeness and accuracy of the input data and the agreed scope of works. All limitations of liability shall apply for the benefit of the employees, agents and representatives of Engeny to the same extent that they apply for the benefit of Engeny.

e) This document is for the use of the party to whom it is addressed and for no other persons. No responsibility is accepted to any third party for the whole or part of the contents of this Report.

f) If any claim or demand is made by any person against Engeny on the basis of detriment sustained or alleged to have been sustained as a result of reliance upon the Report or information therein, Engeny will rely upon this provision as a defence to any such claim or demand.

g) This Report does not provide legal advice.

11 REFERENCES

DEHP (2012). Guideline for Preparation of Water Management Plans for Mining Activities. EM324. Version 1. July 2012.

DES (2019). Environmental Protection (Water and Wetland Biodiversity) Policy 2019 Maranoa-Balonne Rivers Basin Environmental Values and Water Quality Objectives. Queensland Government.

IECA (2008). Best Practice Erosion and Sediment Control. International Erosion Control Association (Australasia). November 2008.

Sibleco (2014). Plan of Operations Miles Bentonite Mine. Report prepared Sibelco Australia Limited dated June 2014.

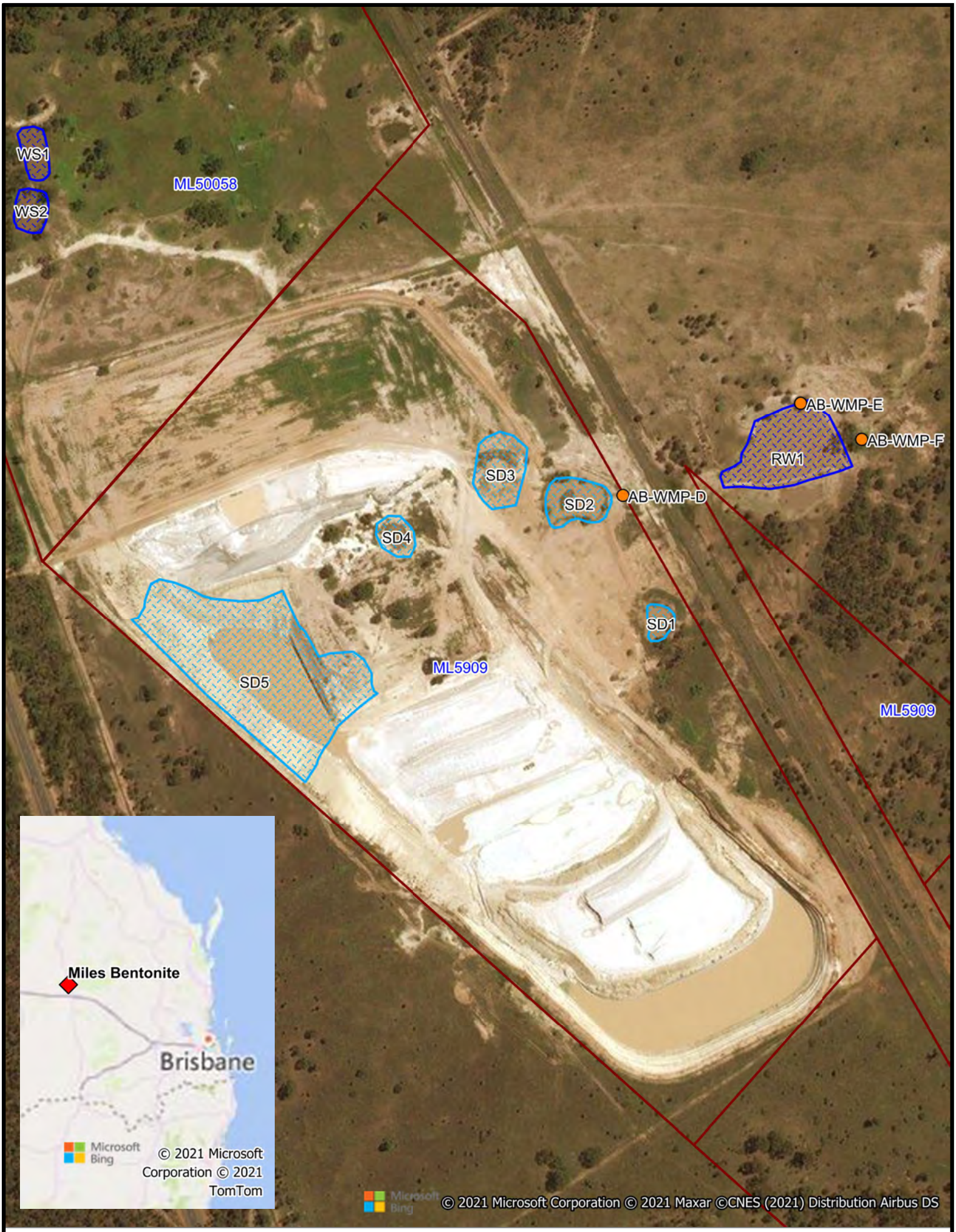
Sibelco (2015). Miles Site - Storm Water Capacity Assessment (ML 5092). Report prepared Sibelco Australia Limited dated 2015

URS (2007). Mile Bentonite Mine Site Water Management plan. Report prepared Unimin Australia Limited dated June 2007.

URS (2007b). Mile Bentonite Mine Water Quality Monitoring Plan. Report prepared Unimin Australia Limited dated June 2007

WRM (2018). Cameby Downs Mine Continued Operations Project – Surface Water Assessment. Report to Syntech Resources Pty Ltd dated 11 September 2018

Appendix A:
Maps



MILES MINE - WATER MANAGEMENT AND MONITORING

Proposed EA water monitoring location

Sediment Dam

Water Storage Dam

Mining Lease Boundaries

SIBELCO

MAP:SAL471 Rev7

0 0.2

kilometers

N

E:\MAP Info Directories\ERC_Estimated Rehabilitation Cost\Miles\WOR Miles Mapping.WOR; Created: LKarklis; Date: 22/07/2021; Projection: Popular Visualization CRS;
Spatial Accuracy: Due to varying sources of data, spatial layers may not align when overlaid. This product is for informational and illustrative purposes only and as such should not be relied on for accuracy and completeness.

MILES PLANT - WATER MANAGEMENT AND MONITORING

EA Water Monitoring locations

Irrigation Pump

Water Storage Dams

Irrigation Areas

Water Management/Sediment Dams

Mining Lease Boundaries

SIBELCO

MAP:SAL472 Rev2

0 0.25

kilometers

N

E:\MAP Info Directories\ERC_Estimated Rehabilitation Cost\Miles\WOR Miles Mapping.WOR; Created: LKarklis; Date: 2/06/2021; Projection: Popular Visualization CRS;
Spatial Accuracy: Due to varying sources of data, spatial layers may not align when overlaid. This product is for informational and illustrative purposes only and as such should not be relied on for accuracy and completeness.


ENGENY
WATER MANAGEMENT

Appendix 7

Final Land Use and Rehabilitation Plan

FINAL LAND USE & REHABILITATION PLAN

TERREQUIP MILES BENTONITE MINE

prepared by Ausrocks Resource Consultants
for Department of Environment and Science

AUQ00238F

TERREQUIP MILES PTY LTD

MILES BENTONITE MINE – FINAL LAND USE & REHABILITATION PLAN

7 FEBRUARY 2024

AUSROCKS RESOURCE CONSULTANTS

Unit 3, 50 Northlink Place
Virginia, QLD, 4014

Email: info@ausrocks.com.au
Phone: (07) 3161 4108
www.ausrocks.com.au
ABN: 64 056 939 014

Document Control

General Information

Item	Detail
Project Name	Miles Bentonite Mine
Project Number	AUQ00238F
Document Title	Final Land Use & Rehabilitation Plan
File Name	EPML00382513-FLURP-Miles
File Location	\00238_Terrequip Pty Ltd\F - Miles\Mine Planning\SBMP\SBMP 2023\FLURP
Revision Status	1.0

Revision History

Revision	Issue	Prepared by	Reviewed by	Date
1.0	Draft	RM	CM	25/01/2024
1.0	Final	RM	CM	7/02/2024

Issue Register

Date	Distribution List
7/02/2024	Terrequip Miles Pty Ltd
7/02/2024	Department of Environment and Science

Limitations

This document has been prepared on behalf of and for the exclusive use of the client. This document has been prepared with all due care and attention according to accepted practices and techniques. This document is intended only for the client and may not be relied upon by any other person.

In preparing this document, Ausrocks Pty Ltd has relied upon, and presumed accurate, certain information (or absence thereof) relative to data provided by government officials and authorities, the client, and other sources as identified in the document. Except as otherwise stated, Ausrocks Pty Ltd has not attempted to verify the accuracy or completeness of any such information.

Ausrocks Pty Ltd accepts no responsibility for any misuse or application of the material set out in this document for any purpose other than the purpose for which it is provided. Ausrocks Pty Ltd accepts no responsibility for any damages of whatsoever nature, however caused arising from misapplication or misinterpretation by third parties of the contents of this document.

This document has been reviewed and signed off by the undersigned:

Carl Morandy (RPEQ22981)

Managing Director, Ausrocks Pty Ltd

Table of contents

List of figures

List of tables

List of appendices

Terms & Abbreviations

ARC	Ausrocks Resource Consultants (Ausrocks Pty Ltd)
EA	Environmental Authority
ML	Mining Lease
Terrequip	Terrequip Miles Pty Ltd
Sibelco	Sibelco Australia Ltd
Site	Miles Bentonite Mine
FLURP	Final Land Use and Rehabilitation Plan

1 INTRODUCTION

This Final Land Use and Rehabilitation Plan (FLURP) is prepared for the Miles Bentonite Mine (site) owned and operated by Terrequip Miles Pty Ltd (Terrequip) for mining leases (MLs) ML5898, ML5900, ML5901, ML5902, ML5905, ML5906, ML5907, ML5909, ML50058 under environmental authority (EA) EPML00382513. Mine rehabilitation is the return of disturbed land to a safe, stable, non-polluting condition that supports a post-mining land use (PMLU).[1] This FLURP ensures that all areas disturbed by mining activities shall be suitably and progressively rehabilitated in accordance with the requirements of the site EA.

From herein the mining leases shall be referred to as:

- Ausben Leases – ML5907, ML5909, ML50058
- Gurulmundi Leases – ML5898, ML5902, ML5905, ML5906
- Woleebee Leases – ML5900, ML5901

1.1 Scope

This FLURP provides for the effective long-term rehabilitation management strategy for mining activities conducted at Terrequip Miles. The FLURP may be updated from time to time based on advances in rehabilitation methodologies, changes to proposed mining activities, changes to legal requirements, and/or the correction of accidental omissions/errors.

1.2 Objectives

The objectives of this plan are to ensure rehabilitation of land disturbed by mining activities is:

- safe for humans and wildlife;
- non-polluting;
- stable;
- able to sustain an agreed post-mining land-use in accordance with the site's FLURP;
- revegetated with species endemic appropriate to achieve the agreed post-mining land use and is free of declared pest species;
- compliant with the site's FLURP; and
- compliant with all conditions of the site's EA (EPML00328513).

In accordance with the site EA, this FLURP must include, but is not limited to the following:

- a description of rehabilitation management techniques incorporating works and monitoring programs and timetables;
- indicators for success; and

[1] Office of the Queensland Mine Rehabilitation Commissioner. https://www.qmrc.qld.gov.au/research/post-mining-land-uses

- keeping of appropriate records or rehabilitation measures implemented including taking of photographs demonstrative of rehabilitation achieved and the preparation of annual rehabilitation progress reports.

2 GOVERNING DOCUMENTS

2.1 Relevant legislation

Federal, State and/or Local Government legislation applicable to this FLURP include:

- *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Environmental Protection Act 1994* (EP Act)
- *Environmental Protection Regulation* 2019 *(EP Regulation)*
- *Environmental Protection (Rehabilitation Reform) Amendment Regulation 2019*

2.2 Other resources

- Mine Land Rehabilitation Policy
- DES (May 2014) Rehabilitation Requirements for Mining Resource Activities Guideline (ESR/2016/1875)
- QMRC (March 2023) Evaluating Methods for Assessing Native Ecosystem Mine Rehabilitation Success
- DSITI (2015) Queensland Herbarium BioCondition Assessment Manual
- DSITI (2017) Method for the Establishment and Survey of Reference Sites for BioCondition

3 SITE DESCRIPTION

The Gurulmundi and Ausben leases are positioned within 1km of each other and are accessible via the Leichhardt Highway and Gurulmundi Road in the Western Downs Regional Council Local Government Area (LGA). These leases are approximately 30km north of Miles and approximately 4.5km southeast of another bentonite mine (Amcol Australia Gurulmundi Mine, operated by Minerals Technologies Incorporated). The Woleebee leases are located approximately 30km north west of the processing facility (ML59002) and are accessible via Jackson Wandoan Road in the Maranoa Regional Council LGA.

The table below summarises the primary mine features and infrastructure as approved under the EA.

Table 1: Primary mine features and infrastructure at Miles Bentonite

Mine domain	Mine feature name
Ancillary infrastructure	• Mining footprint • Mine infrastructure • Access tracks, ancillary roads and haul roads • Administration, office buildings, carparks and amenities • Laydown areas (including vehicle manoeuvring) • Material storage • Weighbridge • Potable water (bottled)
Dams	• Sediment dams (including sediment controls) • Onsite raw water storage
Combined stockpile areas	• Topsoil stockpiles • Waste rock dumps and overburden stockpiles • Storage pads
Non-mining areas	• Undisturbed land • Rehabilitation areas (complete and in progress)
Utilities / Services	• Non-potable water (rainwater tanks) • Septic sewage • Power lines • Communications

3.1 Area and disturbance type

Mining activities conducted within the mining leases described in **Table 2** are currently authorised under environmental authority (EA) EPML00382513.

Table 2: Terrequip Miles lease and tenure details

Mining lease	Permit name	EA holder	Purpose	Area (ha)
Ausben Leases				
ML5909	AUSBEN NO. 1	Terrequip Miles Pty Ltd	Mining	28.00
ML5907	AUSBEN NO 2	Terrequip Miles Pty Ltd	Reserves; undisturbed land	31.94
ML50058	AUSBEN NO.3	Terrequip Miles Pty Ltd	Mining	19.76
Gurulmundi Leases				
ML5898	SLIPPERY	Terrequip Miles Pty Ltd	Reserves; undisturbed land	30.70
ML5902	CLAYMUNDI	Terrequip Miles Pty Ltd	Processing facility; mining	60.70
ML5905	BENTON NO 1	Terrequip Miles Pty Ltd	Reserves; undisturbed land	13.75
ML5906	BENTON NO 2	Terrequip Miles Pty Ltd	Reserves; undisturbed land	36.00
Woleebee Leases				
ML5900	WOLEEBEE NO. 1	Terrequip Miles Pty Ltd	Reserves; undisturbed land	24.50
ML5901	WOLEEBEE NO. 2	Terrequip Miles Pty Ltd	Reserves; undisturbed land	25.11
			Total	**270.46**

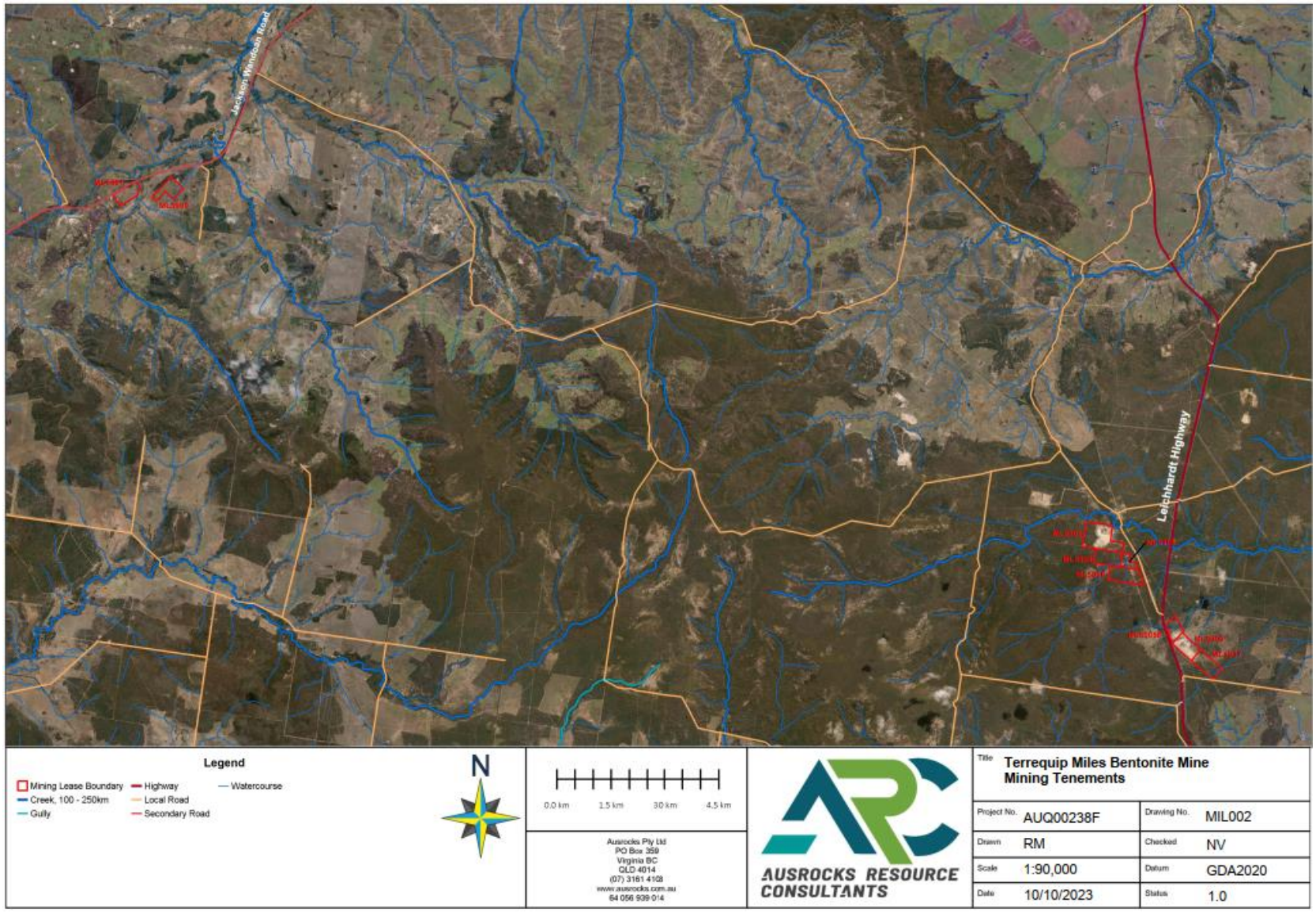


Figure 1: Terrequip Miles mining tenements

4 LAND MANAGEMENT VALUES

4.1 Climate

The Miles area typically experiences a dry humid sub-tropical climate. Data from the Bureau of Meteorology Miles Post Office Weather Station (Station no. 042023) reports mean maximum temperatures between 30-33ºC in the warmer months (November to March) and 19-25°C in the cooler months (June to September).

4.2 Geology

The leases are positioned on relatively flat plains and are surrounded by undulating hills with elevation ranging from 360m to 390m AHD in the Gurulmundi and Ausben leases and 310m to 330m AHD in the Woleebee leases.

The site is underlain regionally by a sequence of Jurassic and Cretaceous sedimentary rocks, forming part of the Surat Basin northeastern margin. The Ausben and Gurulmundi leases surface geology consist of sedimentary rock Kumbarilla Beds and the Woleebee leases of sedimentary rock Orallo Formation (adjacent to an area of Mooga Sandstone).

4.3 Soils

A soil survey was conducted in July 2023 on mining leases ML5092, ML5907, ML5909 and ML50058 (note, ML5898, ML5905, ML5906 were not accessible during the day of survey and ML5900 and ML5901 were not included in the survey scope).[2] Due to a lack of available historical records, the purpose of the assessment was to conduct a land assessment survey in non-disturbed areas of the site to provide background data of the existing landscape as a baseline for rehabilitation purposes.

The primary and only soil type described for the surveyed leases is Brown and Grey Sodosols (classified using the Australian Soil Classification (ASC) system.[3] Sodosol are texture contrast soils, typically characterised by sandy loam or clay loam surfaces over light to medium clay sub-soils that are sodic in the upper portion of the B-horizon.

4.4 Hydrology

Due to soil characteristics, natural drainage off-site is primarily via overland flow over a gentle slope to Little Tree Creek; this creek provides intermittent flows to Dogwood Creek which supplies water to the Miles township via the Gil Weir.

Water captured onsite shall be redirected for re-use in site personal hygiene, dust suppression and/or rehabilitation activities. Water is not a requirement for the mining and/or processing of bentonite. Water shall be

[2] Horizon Soil Science and Engineering (August 2023): Report on the Soil Survey of Leases of the Terrequip Miles Bentonite Mine. Revision 1.1
[3] Isbell, R.F. (2021). The Australian Soil Classification, Third Edition. CSIRO Publishing, Collingwood Victoria.

management via a Site Water Management and Monitoring Plan (SWMMP) as required under Schedule C of the EA.

4.5 Flora and fauna

Fauna and flora (native vascular) species observed are provided in **Appendix 1** .

5 LAND SUITABILITY ASSESSMENT

Agricultural land in classification in Queensland follows a simple hierarchical scheme that is applicable across the state.[4] It allows the presentation of interpreted land evaluation data to indicate the location and extent of agricultural land that can be used sustainably for a wide range of land uses with minimal land degradation. Three broad classes of agricultural land and one non-agricultural land class are identified:

- Class A – crop land
- Class B – limited crop land
- Class C – pasture land
- Class D – non-agricultural land

The table below summarises the relationship between agricultural land classes and land capability and land suitability for grazing.

Table 3: Agricultural Land Classification and correlations with land capability and suitability

Agricultural Land Class	Land capability	Land suitability	Description
A	I – III	1 – 3	**CROP LAND**– Land that is suitable for a wide range[1] of current and potential crops with nil to moderate limitations.
A1	II	1 – 3	Suitable for a wide range of current and potential broadacre and horticulture crops.[2]
A2	III	1 – 3	Suitable for a wide range of current and potential horticulture crops only.
B	III – IV	1 – 3	**LIMITED CROP LAND**– Land that is suitable for a narrow range[3] of crops. The land is suitable for sown pastures and may be suitable for a wider ranges of crops with changes to knowledge, economics or technology.
C	V – VII	1 – 2	**PASTURE LAND**– Land that is suitable only for improved or native pastures due to limitations that preclude continuous cultivation for crop production. Some areas may tolerate a short period of ground disturbance for pasture establishment.
C1	V	1 – 2	Suitable for grazing sown pastures requiring ground disturbance for establishment; or native pastures on higher fertility soils.
C2	VII	3	Suitable for grazing native pastures, with or without the introduction of pasture, and with lower fertility soils than C1.
C3	VII	4	Suitable for light grazing of native pastures in accessible areas and includes steep land more suited to forestry or catchment protection.
D	VIII	**5**	**NON-AGRICULTURAL LAND**[4]– Land not suitable for agricultural use, including land alienated from agricultural use.

[1] A wide range of crops is four or more existing crops of local commercial significance.
[2] Horticulture includes intensively grown small crops (e.g. vegetables) as well as tree crops (e.g. grown or nuts, seeds or fruit). Silviculture (plantation forestry) is not included.
[3] A narrow range of crops is three of fewer types (broadacre or horticulture) of local commercial significance. Silviculture (plantation forestry) may be included. Crops with similar agronomic requirements e.g. maize and grain sorghum, peaches and nectarines are not generally regarded as different crop types. Different management regimes (including irrigation strategies) for the same crop do not increase the number of crops.
[4] Non-agricultural land includes land that cannot be placed in any of the other land classes and includes land such as urban areas and stream channels.
[5] In cases where two or more land classes are equally dominant and none are greater than 50%, judgement is used to identify the most appropriate agricultural land class/es for the unit.

[4] DSITI & DNRM (December 2015): Guidelines for Agricultural Land Evaluation in Queensland, Second Edition.

Land suitability classification assesses the potential of land for a specific land use. Five (5) land suitability classes are defined for use in Queensland (classes 1 to 3 are suitable for agricultural production):

- Class 1 – suitable land with negligible limitations
- Class 2 – suitable land with minor limitations
- Class 3 – suitable land with moderate limitations
- Class 4 – unsuitable land with severe limitations
- Class 5 – unsuitable land with extreme limitations

Land capability classification evaluates the potential of land for broadly defined land uses (e.g. cropping, pastoral, non-agricultural) and is generally only used for broad scale assessment of land. There are eight (8) classes:

- Class I – land suitable for all agricultural and pastoral uses
- Class II – land suitable for all agricultural uses but with slight restrictions for cultivation
- Class III – land primarily suited to pastoral uses but with moderate restrictions for cultivation
- Class IV – land primarily suited to pastoral uses but which may be safely used for occasional cultivation with careful management
- Class V – land that in all other characteristics would be arable but has limitations that make cultivation impractical and/or uneconomic
- Class VI – land that is not suitable for cultivation but is well suited to pastoral use
- Class VII – land that is not suitable for cultivation but on which pastoral use is possible only with careful management
- Class VIII – land that has such severe limitations that it is unsuited for either cultivation or grazing

5.1 Pre-mining land suitability

Due to a lack of historical records there is little information available on pre-mining land use and assessments. Based on existing surrounding land use it is highly likely that the land on which the mine operates has previously been used for grazing purposes.

5.2 Erosion hazard and control

5.2.1 Erosion hazard

Open cut mining activities involve land disturbance that can pre-dispose areas to erosion risks. Mining activities that require the use of erosion mitigation strategies include, but are not limited to:

- topsoil stripping prior to mining development;
- drainage line crossings (pipes and roads);
- waste dump placement; and
- topsoil stockpiles.

5.2.2 Erosion control

Erosion can have an adverse effect on soil productivity and the associated agricultural land value. Additional downstream effects may include sedimentation, reduced fertility and productivity via soil structure losses, increased dust generation, and poor rehabilitation outcomes. Dispersive subsoils with high ESPs and low Ca:Mg ratios are susceptible to tunnel and gull erosion which is particularly difficult to manage once established. Site subsoils are sodic to strongly sodic and therefore will erode due to clay dispersion where soil is exposed to rainfall or runoff.

In accordance with the site EA, progressive rehabilitation will commence when disturbed areas within the operation land become available. Fast action to commence rehabilitation in disturbed areas will help minimise the risk of erosion.

Erosion control practices will be guided by site specific erosion and sediment control plans however, where appropriate, the following methods shall be followed:

- Implementation of contour banks, or Monto Vetiver[5] along crests and contours to control surface flow speed, at intervals appropriate to the slope and soil type to control the flow of surface water;
- Diversion and erosion and sediment control devices should be fully implemented to provide effective erosion control prior to land disturbance activities, and kept in place and maintained until the area has been effectively rehabilitated; and
- Where diversion of runoff water around a construction/rehabilitation site is required, design will need to consider possible erosion effects due to concentration of flow.

[5] Monto Vetiver a sterile perennial clumping grass

6 POST MINING LAND USE AND REHABILITATION

6.1 Rehabilitation principles and hierarchy

The primary rehabilitation goal is to return the land to a PMLU of marginal grazing, and for active pit (final void) areas, marginal grazing or water storage by:

- creating stable rehabilitated landforms that are non-polluting and safe to humans and wildlife;
- ensuring rehabilitated landforms can support sustainable grazing activities;
- implementing and monitoring measurable standards to assess the success of rehabilitated landforms to the agreed grazing and/or water storage PMLU;
- ensuring progressive rehabilitation of disturbed land over the life-of-mine to minimise the amount of land disturbed by mining activities at any one time and reduce the rehabilitation burden prior to mine closure; and
- achieving regulatory approval for surrender of mining leases to allow complete mine closure.

6.2 Post-mining land use

Grazing pastures will be achieved using desirable native (3P) and pasture (exotic) grass species, as well as species required by the landholder. Where appropriate, smaller areas of local native trees and/or shrub species may also be planted to support a PMLU of grazing. This nominated land use will ensure the land remains agriculturally productive, is consistent with surrounding land uses, and land use agreed upon with the landholder. Where agreed with the landholder, final pit voids and existing water storage structures will be rehabilitated for use as stock dams to support grazing land use.

The proposed PMLU for areas undisturbed by mining activities will be grazing and native ecosystem.

6.3 Rehabilitation strategies

The rehabilitation strategy relies on the progressive rehabilitation of areas disturbed by mining activities including, but not limited to:

- appropriate pre-disturbance preparation (e.g. topsoil management plan, integrated mine planning to efficiently coordinate mining activities;
- implementation of practical landform designs to prevent erosion and establish long-term geotechnical stability;
- identification of an appropriate PMLU that is consistent with local environmental conditions;
- avoiding the placement of sodic/dispersive material near the surface of dumps or within plant root zones;
- progressive rehabilitation of disturbed areas using appropriate rehabilitation procedures;
- implementing an appropriate rehabilitation monitoring program to assess rehabilitation success against accepted performance indicators; and
- a corrective action program to address areas of substandard rehabilitation.

6.3.1 Progressive rehabilitation

A progressive rehabilitation program will continue to be implemented and commence as soon as possible and when areas become available within the operational land. Progressive rehabilitation will include, but are not limited to:

- development of a stable slope design that incorporates appropriate water management structures (e.g. contour banks);
- use of suitable topsoil which will be stockpiled until rehabilitation areas are available and/or will be respread immediately across available recontoured areas;
- contour ripping to promote infiltration and minimise runoff;
- seeding with an appropriate seed mix (grass, shrub and/or tree species) prior to the commencement of the wet season to maximise the benefits of subsequent rainfall;
- application of appropriate fertiliser and/or ameliorants for plant establishment (if required); and
- battering down of final void slopes to create depressed landforms that can safely support the proposed PMLUs.

6.3.2 Topsoil

Suitable topsoil will be stripped from each new mining area for subsequent use in the rehabilitation program. Topsoil will be stripped as defined by soil surveys and will either be stockpiled until required for rehabilitation or will be immediately respread in available rehabilitation areas. Topsoil resources present are determined adequate for the rehabilitation of disturbed areas.

6.3.3 Revegetation

Revegetation methods for areas disturbed by mining activities will consist of, but not limited to:

- respreading stockpiled and/or freshly stripped topsoil;
- contour ripping;
- application of an appropriate fertiliser and/or ameliorant for plant establishment (and after soil chemical analysis, if required); and
- seeding with an appropriate seed mix.

6.3.4 Rehabilitation maintenance

Rehabilitation areas shall be monitored to ensure early detection of any areas requiring maintenance and/or repair. Rehabilitation areas that have not achieved the designated acceptance criteria shall be repaired.

Supplementary planting and/or seeding may be used to increase species diversity and/or groundcover. Maintenance work shall be performed to repair any areas of exhibiting excessive or concerning soil erosion. In the event problem areas occur, these shall be investigated to determine the cause/reason and to identify the most appropriate method for repair.

6.3.5 Decommissioning

Upon completion of mining activities, infrastructure shall be treated as follows and as agreed upon with the landholder:

- roads and tracks agreed to remain for use as farm roads, or otherwise will be rehabilitated;
- existing water structures (e.g. sediment dams, raw water storage) to remain for use as stock dams;
- infrastructure to remain for potential future use by the landholder, or otherwise will be decommissioned and rehabilitated;
- where suspected or known, contaminated land management will be completed as required under the EP Act; and
- final voids remaining at the end of the mine life will remain for use as stock dams by the landholder, or otherwise will be battered down to form depressed landforms to support a grazing PMLU.

A Post-Surrender Management Report and Compliance Statement shall be produced as a statutory requirements of the surrender process for environmental authorities and their associated mining tenements[6].

[6] Application for surrender or partial surrender of an environmental authority for a resource activity (ESR/201/1751) Version 5.03

7 SELECTION AND DESCRIPTION OF ANALOGUE SITES

7.1 Methodology for selection of analogue sites

Analogue sites are selected to represent grazing Land Class C2 and Land Capability VII. Analogue sites are used as a means of providing a baseline to which future land use rehabilitation may be measured to prove achievement of acceptance criteria. The sites are intended to be representative of a surrounding land use typical of grazing land class C2 and land capability VII.

7.2 Proposed rehabilitation acceptance criteria

Acceptance criteria for land disturbed by mining activities is summarised in following tables:

Table 4: Grazing PLMU acceptance criteria

Goal	Objective	Indicator	Acceptance criteria
Safe to humans and wildlife	Safety hazards in rehabilitation are not significantly different to surrounding unmined landscapes subject to the same land use	Hazard assessment	No significant difference
Stable	Rehabilitation is geotechnically stable	Factor of safety (FoS)	FoS ≥1.5[1]
	Rehabilitation is erosionally stable	Extent, slope gradient and groundcover	Groundcover ≥50% 70% slopes ≤20% gradient
Non-polluting	Rainfall runoff from rehabilitation achieves relevant water quality objectives for receiving waters	ANZECC 95% aquatic ecosystem threshold	No significant difference
	Deep drainage from rehabilitation achieves relevant water quality objectives for groundwater	ANZECC 95% aquatic ecosystem threshold	Not significantly different to local water quality objectives in accordance with the Queensland Water Quality Guidelines[7]
Able to sustain an agreed post-mining land use	Rehabilitation is suitable for sustainable grazing pasture	Land suitability assessment for grazing pasture	Land suitability class ≥3 or not different from pre-mining class if ≥4

[1] *ANCOLD (2017): Factor of Safety*

[7] Queensland Department of Environment and Heritage Protection (re-published July 2013): Queensland Water Quality Guidelines 2009

Table 5: Water Storage PLMU acceptance criteria

Goal	Objective	Indicator	Acceptance criteria
Safe to humans and wildlife	Safety hazards in rehabilitation areas are not significantly different to existing safety hazards in surrounding unmined environment (subject to similar land use)	Hazard assessment	No significant difference
Stable	Rehabilitation is geotechnically stable	Factor of safety (FoS)	Steep slopes adequately fenced
	Rehabilitation is geotechnically stable	Factor of safety	FoS ≥1.5[1]
Non-polluting	Rehabilitation is erosionally stable	Extent, slope gradient and groundcover	Groundcover ≥50% 70% slopes ≤20% gradient
	Rainfall runoff from rehabilitation achieves relevant water quality objectives	ANZECC 95% aquatic ecosystem threshold	No significant difference
Able to sustain an agreed post-mining land use	Deep drainage from rehabilitation achieves relevant water quality objectives for groundwater	ANZECC 95% aquatic ecosystem threshold	Not significantly different to local water quality objectives developed in accordance with the Queensland Water Quality Guidelines[2]

[1] *ANCOLD (2017): Factor of Safety*
[2] *DEHP (2013): Queensland Water Quality Guidelines*

8 REPORTING FRAMEWORK

8.1 Monitoring of rehabilitation works

At the commencement of rehabilitation works in a new area, permanent photograph points shall be established and delineated with a star picket or other suitable visible marker post. The geographic location and bearing of the photograph shall be recorded using GPS coordinates. This point will form the start of a permanent monitoring site for rehabilitation until certification can be achieved.

8.2 Annual rehabilitation reports

In accordance with the site EA, an Annual Rehabilitation Report (ARR) shall be completed documenting qualitative rehabilitation progress achieved including remediation works required and/or applied for the relevant reporting period. The ARR shall include, but will not be limited to:

- a summary description of visual monitoring for active rill/gully erosion within the first 12 months after seeding and after heavy rainfall events;
- photographs of the new rehabilitation areas from permanent photographic points;
- a summary record of treatments used, including seeding rates, soil treatment, topsoil source; and
- a summary description of any failure of rehabilitation works and maintenance conducted or proposed to be conducted for rehabilitation areas.

8.3 Revegetation monitoring program

It is proposed that rehabilitation will be monitored every two (2) years until success has been achieved (i.e. certification). During the monitoring program, revegetation will be compared against success criteria proposed in **Table 4** for marginal grazing. During the monitoring program the following details will be collected:

- photographic evidence of existing and new rehabilitation areas from permanent photographic points;
- record of treatments used for each new rehabilitation (including seeding rates, soil treatment, topsoil source);
- botanical description of the rehabilitation area (including percentage cover and species diversity);
- presence and abundance of weed species;
- landform monitoring (including slope angle, contour bank spacing, waterways, presence/absence of rill/gully erosion); and
- any failure of rehabilitation works, and maintenance/remediation conducted or proposed for the area.

8.4 Identification of remedial works

Remedial works may be required at a number of stages during the rehabilitation process, including the following actions:

- soil remediation may be required prior to the seeding/planting of rehabilitation areas (requirement based on soil type, stripping depths applied, and where applicable, storage residence times);
- failure to achieve the desired levels of vegetation cover and species diversity will require supplementary seeding and/or planting;
- weed infestation will require treatment to an appropriate standard or as defined by governing legislation; and
- erosion damage may require repair depending on the level of severity – the potential for erosion will be controlled by the establishment of a good ground cover (≥50%) and through the correct design of water management structures.

REFERENCES

AGC Woodward-Clyde (1991). Secure Landfill – Gurulmundi Final Impact Assessment

BOM. (2023). Australian Bureau of Meteorology. http://www.bom.gov.au/

DSITI & DNRM (2015). Guidelines for Agricultural Land Evaluation in Queensland, Second Edition.

DEHP (2013). Queensland Water Quality Guidelines 2009.

Horizon Soil Science and Engineering (2023). Report on the Soil Survey of Leases of the Terrequip Miles Bentonite Mine. Revision 1.1.

Isbell, R. F. (2021). The Australian Soil Classification, Third Edition. CSIRO Publishing, Collingwood Victoria.

Queensland Government. (2023). Queensland Globe. https://qldglobe.information.qld.gov.au/

Queensland Government. (2023). Post-mining land uses. Office of the Queensland Mine Rehabilitation Commissioner. https://www.qmrc.qld.gov.au/research/post-mining-land-uses

APPENDICES

Appendix 1 Observed Flora and Fauna Species

Appendix 1

Observed Flora and Fauna Species[8]

[8] AGC Woodward – Clyde (1991): Secure Landfill – Gurulmundi Final Impact Assessment Study Report (prepared for CEM Unit Bureau of emergency Services)

Table 6: Summary of observed flora and fauna species

Scientific name	Common name
Mammals	
Tachyglossus aculeatus	Short Beaked Echidna
Macropus doralis	Black-striped Wallaby
M. giganteus	Eastern Grey Kangaroo
Eptesicus pumilus	Little Cave Eptesicus
Birds	
Dromaius novaehollandiae	Emu
Anas superciliosa	Pacific Black Duck
Aquila audax	Wedge-tailed Eagle
Falco berigora	Brown Falcon
Geopilia placida	Peaceful Dove
Phaps chalcoptera	Common Bronzewing
Geophaps lophotes	Crested Pigeon
Cacatua roseicapilla	Galah
C. glaerita	Sulphur-crested Cockatoo
Leptolophus novaehollandiae	Cockatiel
Trichoglossus haematodus	Rainbow Lorikeet
Alisterus scapularis	Australian King Parrot
Aprosmictus erythropterus	Red Winged Parrot
Platycercus eximius	White-cheeked Rosella
Aegotheles cristatus	Australian Owlet-nightjar
Dacelo novaguineae	Laughing Kookaburra
Coracina novaeholandiae	Black-faced Cuckoo-shrike
Microeca leucophaea	Jack-winter
Eopsaltria australis	Eastern Yellow Robin
Petroica gooenovii	Red-capped Robin
P. rosea	Rose Robin
Pachycephala pectoralis	Golden Whistler
P. rufiventris	Rufos Whistler
Colluricincla harmonica	Grey Shrike-thrush
Rhipidura fuliginosa	Grey Fantail
Pomatostomus temporalis	Grey-crowned Babbler

Scientific name	Common name
Sericornis sagittatus	Speckled Warbler
Smicronis brevirostris	Weebil
Acanthiza pusilla	Brown Thornbill
A. nana	Yellow Thornbill
A. reguloides	Buff-rumped Thornbill
A. crysorrhoa	Yellow-rumped Thornbill
Gerygone fusca	Western Gerygone
Plectorhyncha lanceolata	Stripped Honeyeater
Philemon corniculatus	Noisy Friarbird
Entomyzon cyanoits	Blue-faced Honeyeater
Manorina melanocephala	Noisy Miner
Lichenostomus chrysops	Yellow-faced Honeyeater
L leucotis	White-eared Honeyeater
Melithreptus brevirostris	Brown-headed Honeyeater
Dicaeum hirundinaceum	Mistletoebird
Pardalotus punctatus	Spotted Pardalote
p. stiatus	Striated Pardalote
Taeniopygia bichennovii	Double-barred Finch
Struthidea cinerea	Apostlebird
Grallina cyanoleuca	Australian Magpie-lark
Artamus cyanopterus	Dusky Woodswallow
Cracticus torquatus	Grey Butherbird
Gymnorthina tibicen	Australian Magpie
Strepera graculina	Pied Currawong
Corvos coronoides	Australian Raven
c. orru	Torresian Crow
Reptiles	
Diplodactylus taenicuada	Golden-tailed Gecko
Menetia greyii	Skink
Varnus gouldi	Sand Monitor
Flora (vascular plants)	
Callitris columellaris	White Cypress
Cheilanthes sieberi	Cloak Fern

Scientific name	Common name
Craspedia chrysantha	Yellow Buttons
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus fibrosa	Broad-leaved Ironbark
Eucalyptus maculata	Spotted Gum
Cyperus victoriensis	Yelka Sedge
Fimbristyis dichotoma	Fringe Rush
Juncus usitatus	Common Rush
Cymbidium canaliculatum	Black Orchid
Eleocharis blakeana	Spike Rush
Aristida spp.	Wire Grass
Cymbopogon refractus	Barwire Grass
Cynodont dactyon	Green Couch Grass
Enneapogon sp.	Nineawn Grass
Heteropogon contortus	Spear Grass
Setaria pumila	Pale Pidgeon Grass
Sporobolus creber	Rat's Tail Grass
Themeda triabdra	Kangaroo Grass
Lomandra leucocephala	Woody Matrush
Xanthorrhoea johnsonii	Grasstree
Cotula australis	Carrot Weed
Chenopodium carinatrum	Green Crumbweed
Maireana microphylla	Eastern Cottonbush
Wahlenbergia graciilis	Native Bell
Casuarina leuhmanii	Buloke
Maytenus cunninghamii	Small Maytenus
Melichrus urceolauts	Urn Heath
Hardenbergia violacea	Sarsaparilla
Indigofera australis	Native Indigo
Goodenia rotounifolia	Roundleaf Goodenia
Amyema sp.	Mistletoe
Sida corrugata	Corrugated Sida
Acacia crassa	Curracabah
Acacia neriifolia	Oleander Wattle

Scientific name	Common name
Acacia spectibilis	Glory Wattle
Angophora costata	Rusty Gum
Hakea purpurea	Crimson Hakea
Boronia bipinnata	Rock Boronia
Solanum densevestiitum	Woolly Nightshade

Appendix 8

Complaint Log

Complaint Log:

Date & Time Complaint Received	Type of Communication[1]	Complainant Name & Contact Details[2]	Nature of Complaint	Investigation Findings	Corrective Actions Identified	Correct Actions Implemented	Date of Complaint Close-out Notice	Owner Name & Signature[3]

[1] *telephone, letter, email, personal, etc.*
[2] *name, contact address and contact telephone number of complainant (note – if the complainant does not wish to be identified then "Not identified" is to be recorded)*
[3] *name of the person responsible for investigating the complaint*

Appendix 9

Risk Assessment Matrix

Qualitative Measure of Consequence

Consequence	Natural Environment	Legal/Government	Community/Reputation/ Media
Insignificant	• Limited damage to minimal area of low significance	• Low-level legal issue • On the spot fine • Technical non-compliance, prosecution unlikely • Ongoing scrutiny/attention from regulator	• Low level social impacts • Public concern restricted to local complaints • Could not cause injury or disease to people
Minor	• Minor effects on biological or physical environment • Minor short-medium term damage to small area of limited significance	• Minor legal issues, non-compliances and breaches of regulation • Minor prosecution or litigation possible • Significant hardship from regulator	• Minor medium term social impact on local population • Could cause first aid injury to people • Minor, adverse local public or media attention or complaints
Moderate	• Moderate effects on biological or physical environment (air, water) but not affecting functioning • Moderate short-medium term widespread impacts (e.g. significant spills)	• Serious breach of regulation with investigation or report to authority with prosecution or moderate fine possible • Significant difficulties in gaining approvals	• Ongoing social issues • Could cause injury to people which requires medical attention • Attention from regional media and/or heightened concern by local community • Criticism by NGOs • Environmental credentials moderately affected
Major	• Serios environmental effects with some impairment of ecosystem function • Relatively widespread medium-long term impacts	• Major breach of regulation with potential major fine and/or investigation and prosecution by authority • Project approval seriously affected	• Ongoing serious social issues • Could cause serious injury or disease to people • Significant adverse national media/public or NGO attention • Environmental credentials significantly affected
Catastrophic	• Very serious environmental effects on significant environment (e.g. National Park)	• Investigation by authority with significant prosecution and fines • Very serious litigation including class actions • License to operate threatened	• Very serious widespread social impacts with potential to significantly affect the wellbeing of the local community • Could kill or permanently disable people • Serious public or media outcry (international coverage) • Damaging NGO campaign • Reputation severely damaged

Qualitative Measure of Likelihood

Likelihood	Description	Guideline
Almost certain	Consequence is expected to occur in most circumstances	Occurs more than once per month
Likely	Consequence will probably occur in most circumstances	Occurs once every 1 month to 1 year
Occasionally	Consequences should occur at some time	Occurs once every 1 year to 10 years
Unlikely	Consequences could occur at some time	Occurs once every 10 years to 100 years
Rare	Consequences may only occur in exceptional circumstances	Occurs less than once every 100 years

Risk Assessment Matrix

LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	**High**	**High**	**Extreme**	**Extreme**	**Extreme**
Likely	**Moderate**	**High**	**High**	**Extreme**	**Extreme**
Occasionally	**Low**	**Moderate**	**High**	**Extreme**	**Extreme**
Unlikely	**Low**	**Low**	**Moderate**	**High**	**Extreme**

Appendix 10

Guideline – Duty to notify of environmental harm

Guideline

Environmental Protection Act 1994

The duty to notify of environmental harm

This guideline provides information regarding the duty to notify the Department of Environment and Science about matters listed in section 320A of the Environmental Protection Act 1994 (the EP Act)*, including those that may cause serious and material environmental harm, in accordance with the duty to notify provisions contained in sections 320 to 320G of the EP Act.*

Table of Contents

ABN 46 640 294 485

Introduction

What is the duty to notify?

Sections 320 to 320E of the *Environmental Protection Act 1994* (the Act) outline the requirements for the duty to notify of **environmental harm**. Section 320 of the Act sets outs the matters that require notification, including:

- impacts to acquirers (from resource activities such as CSG/petroleum and greenhouse gas storage (GHG));
- **pollution incidents** and activities (not authorised under the Act) that are causing or threatening to cause **serious environmental harm** or **material environmental harm;**
- a change in the condition of contaminated land that is causing or threatening to cause **serious environmental harm** or **material environmental harm**; or
- a notifiable activity under Schedule 3 of the Act.

A person is obligated to notify the Department of Environment and Science (the department) within 24 hours of becoming aware of these matters, with the exception of notifiable activities which must be notified with 20 business days. Notification can be made to the department by phone, and then followed up in writing, either by email or registered post (see how to notify).

Please note that the duty to notify under sections 320 to 320G of the Act applies in addition to any other obligations that may arise under the Act, for example under an environmental authority (EA).

It is also noted that the duty to notify under the Act does not negate any other notification requirements under other Queensland legislation. Similarly, because a person has met the notification requirements under other Queensland legislation does not mean the notification requirements under this Act have been met. You must always notify the department if there has been a **pollution incident** that will cause, or threatens to cause environmental harm.

What is environmental harm?

Whether a **pollution incident** or change in the condition of contaminated land is likely to cause or threaten **serious or material environmental harm** will depend on the scale and nature of the impacts on the receiving environment and a range of variable factors, including:

- chemical characteristics;
- toxicity and reactivity;
- amount or volume of release;
- extent of area impacted;
- pathways for contaminant release and spread;
- weather conditions at the time of the event or incident including exacerbating or mitigating factors like rain or temperature;
- proximity of urban areas; and
- proximity, size, value and sensitivity of adjacent environmental areas.

Short and long term impacts need to be considered, including contamination of land and waters, toxic effects on biota, such as plants and animals, and public health risks from exposure to chemicals.

Sometimes the full impact of a **pollution incident** or event is not known until sometime after the event has occurred. In these circumstances, the duty to notify will be triggered as soon as the person becomes aware that the event is causing or threatening **serious or material environmental harm**.

If you are unsure as to whether an incident or event is likely to have caused or threatened **serious or material environmental harm**, we recommend you provide notice to the department in accordance with this guideline.

Emergency

Emergency incidents, such as those involving the release of **hazardous contaminants** from fires, vehicle accidents, and the spillage of explosive, flammable or toxic chemicals, often involve public safety matters and require an immediate response from emergency services. As well as posing a public safety risk, these types of incidents may also threaten or cause **serious or material environmental harm**.

In circumstances where emergency events may not represent a widespread threat to life and property, and are categorised at a lower level, it is important to consider that the event may still cause or threaten **serious or material environmental harm** and should therefore not be discounted from the duty to notify requirements.

Action not limited to when environmental harm is caused or threatened

Actions taken at an early stage in response to an incident may result in the **event** falling short of the threshold at which it would be considered to have caused or threatened **serious or material environmental harm**. While the duty to notify may not apply to these circumstances, other actions to prevent the harm or mitigate the impacts may be required.

The requirement to take such action may arise under a condition of an environmental authority, development approval , ERA standards (former code of environmental compliance), Codes of Practice, or other type of environmental approval or may arise under the general environmental duty[1]. The general environmental duty applies to all persons carrying out an activity and imposes an obligation not to carry out any activity that causes or is likely to cause **environmental harm** unless all reasonable and practicable measures to prevent or minimise the harm are taken. Also, any person carrying out an activity that involves a **relevant industrial chemical** is taken not to comply with the general environmental duty unless the person complies with any risk management measures for the chemical under a scheduling decision under the *Industrial Chemicals Environmental Management (Register) Act 2021* (Cwlth).

An approval condition that requires an operator to notify the department of an event will generally be more prescriptive (there will be more specific detail on information to provide) than the duty to notify provision in the Act and may require different information to be provided than that required under this guideline.

When does the duty to notify arise?

The duty to notify the department arises in the following circumstances:

Role	When does the duty to notify arise?
Person[2]	While carrying out an activity (the primary activity), you become aware that an event has happened that causes or threatens **serious or material environmental harm**, because of an act or omission in carrying out the

[1] Section 319 of the *Environmental Protection Act 1994*.
[2] Section 320A(1) of the *Environmental Protection Act 1994*.

This could be you as an employee, employer, the owner of the land, the occupier, a tradesperson or an operator or anyone carrying out the activity.	primary activity, or another activity carried out in association with the primary activity.
	While carrying out a **resource activity** other than a mining activity, you become aware of the happening of one or both of the following events: • The activity has negatively affected, or is reasonably likely to negatively affect, the water quality of an aquifer; or • The activity has caused the connection of two or more aquifers.* *Note: This requirement does not negate the need for a person to notify in relation to a resource activity that is not related to an aquifer event.
Owner or occupier of land[3]	Becomes aware of: • The presence of, or happening of an event involving a **hazardous contaminant** on the **contaminated land,** causing or reasonably likely to cause **serious or material environmental harm**; or • A change in the condition of the **contaminated land** causing or reasonably likely to cause **serious or material environmental harm**; or • A notifiable activity having been carried out, or being carried out, on the **land**.
An auditor performing an auditor's function under section 568(b) of the Act[4]	Becomes aware of: • The presence of, or happening of an event involving a **hazardous contaminant** on the **contaminated land,** causing or reasonably likely to cause **serious or material environmental harm**; or • A change in the condition of the **contaminated land**, causing or reasonably likely to cause **serious or material environmental harm;** or • A notifiable activity[5] having been carried out, or being carried out, on the land.
Local government[6]	Becomes aware of: • The presence of, or happening of an event involving, a **hazardous contaminan**t in the local government area, causing or reasonably likely to cause **serious or material environmental harm**; • A change in the condition of **contaminated land** in the local government area, causing or reasonably likely to cause **serious or material environmental harm**; or

[3] Section 320A(2) of the *Environmental Protection Act 1994*.
[4] Section 320A(2) of the *Environmental Protection Act 1994*.
[5] See Schedule 3 of the *Environmental Protection Act 1994.*
[6] Section 320A(3) of the *Environmental Protection Act 1994*.

	• A notifiable activity[7] has been, or is being carried out on land in the local government area.

Who has a duty to notify?

In circumstance where the duty to notify arises, the Act sets out obligations on the following persons to give notification **within 24 hours** after becoming aware of the event:

- employees;
- employers;
- other persons such as an employer or company principal;
- owners or occupiers;
- auditors (for the purposes of a contaminated land event);
- local governments; and
- rehabilitation auditors.

In some situations, the duty to notify extends beyond notifying the department, to notifying owners and occupiers of the affected land as well. This is to ensure that any potentially affected persons are aware of the occurrence of a **pollution incident, change in the condition of contaminated land** or **a notifiable activity being carried out on the land**, which exposes them, or their land, to potentially adverse impacts, and gives them an opportunity to take the appropriate action to respond to the situation and comply with their notification requirements.

Note: The duty to notify of a these matters also applies to persons who:

- hold an environmental authority; and/or
- operate under a development approval; and/orAn ERA standard; and/or
-
- carry out an activity for which an environmental approval is not required.

Examples

In order to assist, below are some examples of how the duty to notify may apply to you.

Employees[8]

Role	When does the duty to notify arise?
Employees[9]	If a person is carrying out a primary activity during the person's employment, the person must, no later than 24 hours after becoming aware of the event: • notify their employer of the event, its nature, and the circumstances in which it happened; or

[7] See Schedule 3 of the *Environmental Protection Act 1994.*

[8] Section 320B of the *Environmental Protection Act 1994*.

[9] If the person is carrying out the primary activity as an auditor, performing auditor's functions mentioned in section 568, these requirements do not apply.

	• if the employer cannot be contacted, provide the department with written notice of the event, including its nature and the circumstances in which it happened.

Example:

A truck carrying a container of regulated waste has arrived at its destination and the truck driver has become aware that a substantial volume of waste has leaked from the transport container along the route from the point of origin. The nature and volume of the leaked material is such that it is likely to cause or threaten serious or material environmental harm.

At the point at which the driver becomes aware of the event (i.e. the leakage of the material), the driver has a duty to notify their employer no later than 24 hours after becoming aware of the event.

If the driver cannot contact their employer within 24 hours after becoming aware of the event, the driver must provide written notice to the department.

The notice given to the employer does not have to be in writing but must contain sufficient detail of the event, its nature and the circumstances in which it happened. An employee should always keep a record of when and to whom they gave notice of an environmental harm event.

Other persons[10]

Role	When does the duty to notify arise?
Employer who observes the pollution incident but is not carrying out the primary activity.	The person must, no later than 24 hours after becoming aware of the event, give the department written notice of the event, its nature, and the circumstances in which it happened.
	The person must also, as soon as reasonably practicable after becoming aware of the event, give written notice of the event, its nature, and the circumstances in which it happened to: • any occupier of the affected land; or • any registered owner of the affected land; or • give public notice to persons on the affected land.

Example:

A small business transports regulated waste around the state. The business owner drives a truck carrying a container of regulated waste and upon arrival at the destination becomes aware that a substantial volume of waste has leaked from the transport container along the route from the point of origin.

At the point at which the business owner becomes aware of the event (i.e. the leakage of the material), they have a duty to notify the department within 24 hours after becoming aware of the event. The business owner must also notify the owners or occupiers of the affected land as soon as reasonably practicable.

[10] Section 320C of the *Environmental Protection Act 1994*.

Employers[11]

Role	When does the duty to notify arise?
Employer - becomes aware of an event **after** being informed by an employee.	After an employer has been informed of a notifiable event by an employee, the employer must, no later than 24 hours after becoming aware of the event, give the department written notice of the event, its nature and the circumstances in which it happened.
	An employer must, as soon as reasonably practicable after becoming aware of the notifiable event, give written notice of the event, its nature, and the circumstances in which it happened to: • an occupier of the affected land; or • any registered owner of the affected land; or • give public notice to persons on the affected land
Example: A company transports regulated waste around the state. A person, employed as a truck driver for the company, has reported to the company that 12 hours earlier a substantial volume of waste leaked from the transport container along the route from the point of origin. As the employer is now aware of the event (i.e. the leakage of the material), the employer has a duty to notify the department in writing within 24 hours, and also has a duty to notify owners or occupiers of the potentially affected land as soon as possible. The employer will need to determine the best way to notify the owners or occupiers of the affected land who may be impacted by the event. This can be done by written notice to the owner or occupier or by way of public notice to persons on the affected land.	

Owner, occupier or auditor[12]

Role	When does the duty to notify arise?
Owner, occupier or auditor	An owner, occupier or auditor must, within 24 hours after becoming aware of the presence of, or happening of an event involving a hazardous contaminant, or a change in the condition of **contaminated land**, that is causing, or is reasonably likely to cause, **serious or material environmental harm**, give the department written notice. Note that ***land*** includes— (a) the airspace above land; and (b) land that is, or is at any time, covered by waters; and (c) waters. The written notice must include:

[11] Section 320D of the *Environmental Protection Act 1994*.
[12] Section 320DA of the *Environmental Protection Act 1994*.

	• the nature of the matter mentioned in section 320A(2)(b)(i) or (ii); and • the circumstances in which the person became aware of the matter.
	Within 20 business days after becoming aware that a notifiable activity has been, or is being carried out on the **land** give the department written notice of the activity, unless the person has a reasonable excuse.
Example: An auditor is engaged to prepare an environmental report. During the course of the audit the auditor becomes aware that contaminated groundwater has migrated beyond the boundary of the site onto adjoining land and is causing or is reasonably likely to cause serious or material environmental harm. The auditor must give the department written notice within 24 hours of becoming aware of the event. The written notice must state the nature of the event and the circumstances in which the event or change happened.	

Local government[13]

Who	When does the duty to notify arise?
Local government	A local government must, within 24 hours after becoming aware of the presence of, or happening of an event involving a hazardous contaminant (in the local government area), or a change in the condition of **contaminated land**, that is causing, or is reasonably likely to cause, **serious or material environmental harm**, give the department written notice. Note that *land* includes— (a) the airspace above land; and (b) land that is, or is at any time, covered by waters; and (c) waters. The written notice must include: • the nature of the matter mentioned in section320A(3)(a) or (b); and • the circumstances in which the local government became aware of the matter.
	A local government must, within 20 business days, after becoming aware that a notifiable activity[14] has been, or is being, carried out on land in the local government area, give the department written notice of the activity.
Example: A local government becomes aware of a property that appears to have an historical unlicensed landfill in an urban suburb. Upon inspection of the site, the local government officers identified buried waste of multiple types approximately 5m from a nearby creek. The officers also noticed the	

[13] Section 320DB of the *Environmental Protection Act 1994*.
[14] As defined in Schedule 3 of the *Environmental Protection Act 1994*.

colour of the water at a point in the creek nearest to the buried waste was yellow in colour indicating likely discharge of leachate from the landfill site.

As the local government is now aware of this notifiable activity, the local government has a duty to notify the department in writing within 20 business days.

When is notification not required?

The duty to notify does not apply to an event that is authorised under the Act[15]. An event is authorised under the Act if it is authorised to be caused under:

- an environmental protection policy; or
- a transitional environmental program; or
- an environmental protection order; or
- an environmental authority; or
- a progressive rehabilitation and closure plan (PRCP) Schedule; or
- a development condition of a development approval; or
- a prescribed condition for carrying out a small scale mining activity; or
- an emergency direction; or
- an agricultural ERA standard; or
- temporary emissions licence.

Notice to occupiers of affected land[16]

Where the event occurs on land which is not owned by the person undertaking the primary activity, the owner and/or occupier of the affected land must be notified of the harm or threatened harm. The intention of notifying the owner/occupier is to ensure persons likely to be exposed to any adverse impacts of an event have adequate time to respond to the event. The ways in which a person may give written notice to an owner or occupier of affected land is not limited. However, a person is taken to have given written notice to an occupier or owner of affected land if the notice is:[17]

- left with someone who is apparently an adult living or working on the affected land; or
- if there is no-one on the affected land or the person has been denied access to the affected land, left on the affected land in a position where it is reasonably likely to come to the occupier's attention; or
- posted to the affected land.

Written notice that is posted to, or left at, affected land may be addressed to 'The Occupier'.

In circumstances where it is reasonable to believe that there are large numbers of registered owners or occupiers of the affected land, or there is uncertainty as to whom the registered owners or

[15] Section 320A(4) of the *Environmental Protection Act 1994*.
[16] Section 320E of the *Environmental Protection Act 1994*.
[17] Section 320E of the *Environmental Protection Act 1994.*

occupiers of affected land may be, it is appropriate to give public notice rather than individually notifying each owner/occupier.

Public notice has not been defined in the Act, however a common-sense approach should be adopted when deciding to give public notice. A public notice may include the following methods as a guide:

- radio or television broadcast to ensure there is rapid communication of the information;
- publishing of a written notice of the event in a newspaper;
- the erection of appropriately sized signs in the vicinity of the affected area.

Example:

An explosion and subsequent fire occurs at a chemical factory resulting in the output of a large volume of noxious odours, fumes and gases causing or threatening serious or material environmental harm. Consequently, notification to the department and the owners or occupiers of affected land is required.

The contaminants would be initially airborne and likely to disperse over a wide area, resulting in a large number of potential owners or occupiers to whom notice would be required to be given. The person must, as soon as reasonably practicable after becoming aware of the event, give public notice of the event, including details of its nature and the circumstances in which it happened, to owners or occupiers in the area. Under such circumstances it would be appropriate to give public notice by press notice and radio or television broadcast, to provide notice to the widest possible audience in the shortest possible timeframe.

Defence for failing to notify owners or occupiers[18]

Where failure to give notice to owners or occupiers occurs, it is a defence for a person to prove that, despite failing to give notice, the person made reasonable efforts to identify the affected land and give written notice to each registered owner or occupier of the affected land. As with notifying the department, it is not a defence for a person or employer to fail to comply with a duty to give notice on the grounds that the written notice, or the giving of the written notice, might incriminate the person.

Notice to the department

The standard form – *Duty to Notify of Environmental Harm* may be used for providing written notice to the department. This document is available on the Queensland Government website at www.qld.gov.au using the publication number (ESR/2016/2230) as a search term. The form may also be used where a person is required to given written notice to owners or occupiers.

Use of the department's standard form is not mandatory, however providing the information specified in the template will assist persons giving notice, to meet the requirements of the Act.

Penalties for failing to notify

Penalties exist for failing to notify as follows:

Offence	Max Penalty

[18] Section 320F of the *Environmental Protection Act 1994*.

An employee failing to notify their employer or the department	100 penalty units
An employer or other person failing to notify the department – primary activity	500 penalty units
An employer or other person failing to notify the department – resource activity	100 penalty units
An employer or other person failing to notify particular owners or occupiers of the affected land – primary activity	500 penalty units
An employer or other person failing to notify particular owners or occupiers of the affected land – resource activity	100 penalty units
An owner, occupier or auditor failing to notify the department of a matter mentioned in section 320A(2)(b)	500 penalty units

The *Environmental Protection Act 1994* prescribes the penalty units for the offences against the sections of the Act the offence is associated with.

- The *Penalties and Sentences Act 1992* (the PS Act), administered by the Department of Justice and Attorney-General, provides the definition of a penalty unit and a legislative mechanism for annual indexation increases to the value of a penalty unit.
- Section 3 of the Penalties and Sentences Regulation 2015 prescribes the current monetary value of a penalty unit. The prescribed value increases on July 1 of each year.
- Schedule 1 of the State Penalties Enforcement Regulation 2014 prescribes the offences for which Penalty Infringement Notices (PINs) can be issued and their corresponding penalty unit amounts used to calculate the fine.

For more information visit the Queensland legislation website at www.legislation.qld.gov.au and search for the above-mentioned Acts and regulations.

Reasonable excuse

A person will not be guilty of an offence for failing to comply with the duty to notify, where they have a reasonable excuse. Whether an excuse is a reasonable excuse will depend on the circumstances and facts of each case. Failing to comply with the duty to notify because notification may incriminate you does not constitute a reasonable excuse.

Example:

Where an incident occurred in an isolated area of the state and it was not physically possible to provide written notice to the department within 24 hours, this will amount to a reasonable excuse. However, all reasonable efforts should be made to notify the department within 24 hours in all circumstances. For example, where access to a computer or internet is not possible, a phone call to the Pollution Hotline should be made.

A written notice cannot be used as evidence in court proceedings

A written notice given by a person is not admissible as evidence against the person in a prosecution for an offence against the Act, in relation to the event about which the notice is given. However, other

evidence obtained because of the written notice, or the giving of the written notice, can be admitted as evidence against the person in any legal proceeding.

Providing joint notice

In some circumstances the duty to notify may arise for a number of different people concerning the same event. In such circumstances a number of persons may comply with their individual duty to notify by jointly issuing one notice advising of the event, where this can be achieved within the timeframes. To comply with the duty to notify, the notice should clearly state on whose behalf the notice is given.

If the notice does not clearly state by whom the notice is given, then it may not be sufficient to verify at a later date that a person has complied with their statutory requirement to give notice.

Phoning the Pollution Hotline

In addition to providing the written notice, if a person becomes aware of an event which has caused, or threatens, **serious or material environmental harm**, the person should immediately call the Pollution Hotline on **1300 130 372** and report the event. Reporting the event through the Pollution Hotline allows the department to take necessary measures to prevent further harm and to mitigate the effects of an incident or event.

In addition to notifying the department, it is good practice to notify the relevant local government for the area where the event has occurred.

Notification by emergency services

For major incidents that require response from emergency services, procedures are in place for Queensland Fire and Rescue Services (QFRS) to notify the department through the Pollution Hotline. Where notification is given by QFRS, the department will provide advice on appropriate actions and determine whether it is necessary to attend the site.

How to notify

Written notification to the department must be given by one of the following methods:

- To notify the department of **pollution incidents**, activities (not authorised under the Act) or a change in the condition of contaminated land, submit written notification to the department by:
    - Email: pollutionhotline@des.qld.gov.au - Include **"Duty to notify of environmental harm"** in the subject line and include details as required by the relevant duty to notify provision or attach a completed copy of the *Duty to Notify of Environmental Harm* form available on the Queensland Government website at www.qld.gov.au using the publication number (ESR/2016/2230) as a search term.
- To notify the department of a notifiable activity having been carried out, or being carried out, on the land, submit written notification to the department by:
    - Email: emr.clr.registry@des.qld.gov.au - Include **"Written notice of a notifiable activity"** in the subject line and include details of the notifiable activity or attach a completed copy of the form *Notifiable Activity* available on the Queensland Government website at www.qld.gov.au using the publication number (ESR/2016/1845) as a search term.

- By way of registered post, provide written notice including details as required by the relevant duty to notify provision or a completed copy of the form *Duty to Notify of Environmental Harm* (ESR/2016/2230) to:

  Permits and Licencing

  Department of Environment and Science

  GPO Box 2454

  Brisbane QLD 4001

In addition to any written notification, pollution incidents can be reported 24 hours a day, 7 days a week by phoning the 24/7 Pollution Hotline—1300 130 372 (option 2).

Definitions

Contaminated land means land contaminated by a hazardous contaminant.

Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

Hazardous contaminant is a contaminant, other than an item of explosive ordnance, that if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm.

Material environmental harm is environmental harm (other than environmental nuisance):

- that is not trivial or negligible in nature, extent or context;
- that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount ($10,000), but less than the maximum amount ($100,000); or
- that results in costs of more than the threshold amount ($10,000) but less than the maximum amount ($100,000) being incurred in taking appropriate action to:
  - prevent or minimise the harm; and
  - rehabilitate or restore environment to its condition before the harm.
- The threshold amount will increase by the consumer price index at the start of each new financial year

Pollution incident includes, for example, an event involving a hazardous contaminant.

Relevant industrial chemical means:

(a) a particular industrial chemical; or

(b) a particular class of industrial chemicals.

As per section 7 of the *Industrial Chemicals Environmental Management (Register) Act 2021* (Cwlth).

Serious environmental harm is environmental harm (other than environmental nuisance):

- that is irreversible, of a high impact or widespread;
- caused to an area of high conservation value or special significance, such as the Great Barrier Reef World Heritage Area;

- that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount ($100,000); or
- that results in costs of more than the threshold amount ($100,000) being incurred in taking appropriate action to:
    - prevent or minimise harm; and
    - rehabilitate or restore the environment to its condition before harm.

- The threshold amount will increase by the consumer price index at the start of each new financial year

Resource activity means an activity that involves a geothermal activity, a greenhouse gas (GHG) storage activity, a mining activity or a petroleum activity as set out in section 107 of the *Environmental Protection Act 1994*.

Enquiries:

Permit and Licence Management: Ph: 13 QGOV (13 74 68) Email: palm@des.qld.gov.au

Version history

Version	Effective date	Description of changes
1.00	4 December 2015	Initial upload
2.00	5 July 2016	The document template, header and footer have been updated to reflect current Queensland Government corporate identity requirements and comply with the Policy Register.
2.01	26 August 2016	Links to the Duty to Notify Standard form.
2.02	24 September 2018	The document template, header and footer have been updated to reflect current Queensland Government corporate identity requirements and comply with the Policy Register.
2.03	26 June 2020	Incorporates guideline 'The duty to notify for contaminated land, EM1430' and examples for clearer understanding.
3.00	17 May 2021	Major additions including auditor requirements.
3.01	18 July 2022	Fix typing errors and currency review
4.00	16 April 2023	Major update for the *Environmental Protection and Other Legislation Amendment Act 2023* (EPOLA Act 2023).