Gorgon Project

Carbon Dioxide Injection System Well Maintenance Environment Plan: Summary

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1.0 Introduction

1.1 Overview

Chevron Australia Pty Ltd (Chevron Australia) is the operator for the Gorgon Gas Development (also known as the Gorgon Project) on behalf of the Gorgon Joint Venture (GJV). Offshore production wells and pipeline infrastructure associated with the Jansz–Io and Gorgon gas fields gathers and transports gas to the Gorgon Gas Treatment Plant (GGTP) on Barrow Island, where it is processed.

Carbon dioxide (CO_2), which occurs naturally in the feed gas, is separated during the production process and injected in a supercritical state into deep rock formations below Barrow Island.

1.2 Location

The CO_2 Injection System Wells on Barrow Island are located within the Pipeline Licence—PL93—Licence Area (Figure 1-1) and are spread across three CO_2 injection drill centres (DC-A, DC-B, and DC-C) and two pressure management drill centres (DC-D and DC-E). The Licence Area (Figure 1-1) encompasses much of Barrow Island, which allows for the potential development and expansion of the CO_2 Injection System.

The scope of this Plan is limited to the petroleum activity (as described in Section 2.0) that occurs within the Operational Area or drill centres (as defined in Figure 1-1).

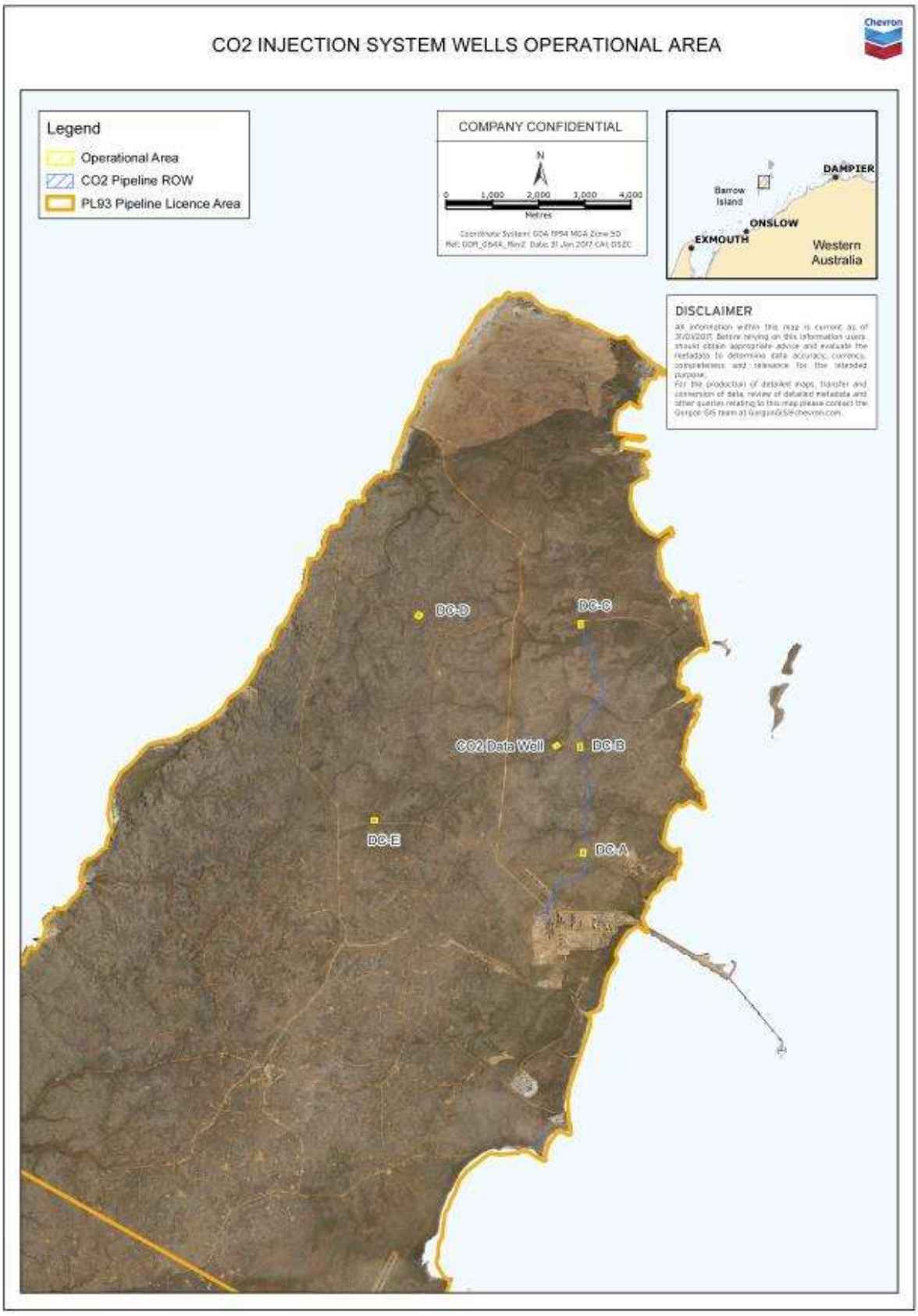

Figure 1-1: Operational Area for CO_2 Injection System Wells

1.3 Scope

The PL93 Licence Area (Figure 1-1) encompasses much of Barrow Island, identified at the licence application stage to allow for the potential development and expansion of the CO_2 Injection System. The scope of the Environment Management Plan (EMP) is limited to the activity as summarised in Section 2.0.

1.4 Licence Holder and Operator Details

Chevron Australia Pty Ltd is nominated as the operator on behalf of the GJV title holders (Table 1-1) for Pipeline Licence PL93, granted under the *Petroleum Pipelines Act 1969* (WA).

Table 1-1: Titleholder Details

Titles	Details	Titleholders	Operator	Address
PL93	CO_2 Injection System Pipeline Licence Onshore	• Chevron (TAPL) Pty Ltd • Shell Australia Pty Ltd • Mobil Australia Resources Company Pty Ltd • Tokyo Gas Gorgon Pty Ltd • Osaka Gas Gorgon Pty Ltd • JERA Gorgon Pty Ltd	Chevron Australia Pty Ltd	QV1, 250 St Georges Terrace, Perth, WA, 6000

In accordance with the Petroleum Pipelines (Environment) Regulations 2012, contact details for the operator, Chevron Australia Pty Ltd, are listed in Table 1-2.

Table 1-2: Operator Contact Details

Company Name	Chevron Australia Pty Ltd
Nominated Liaison Person	John Connor
Position	Drilling and Completions Manager
Business Address	GPO Box S1580, Perth WA 6845
Telephone Number	+61 8 9216 4254
Fax Number	+61 8 9216 4223
Email Address	austdrillingops@chevron.com

1.5 Stakeholder Engagement

Regular consultation with relevant stakeholders has been undertaken by Chevron Australia throughout the development of the environmental impact assessment management documentation for the Gorgon Gas Development and Jansz Feed Gas Project.

Stakeholder consultation has included engagement with the community, government departments, industry operators and contractors to Chevron Australia via planning workshops, risk assessments, meetings, teleconferences, and the formal environmental approval processes.

1.5.1 Stakeholder Identification

In accordance with Regulation 17 of the Petroleum Pipelines (Environment) Regulations 2012, Chevron Australia completed a scoping exercise to determine which authorities, persons, and organisations were considered to be relevant.

No permanent population resides on Barrow Island. Barrow Island has been actively used for petroleum exploration and production purposes since 1957 and access to Barrow Island is restricted to personnel associated with oilfield operations, Western Australian Department of Biodiversity, Conservation and Attractions (formerly Parks and Wildlife) staff, and Gorgon Gas Development and Jansz Feed Gas Pipeline staff. Therefore, the relevant stakeholders associated with the maintenance of the CO_2 Injection System Wells were identified as:

- Department of Biodiversity, Conservation and Attractions (State)
- Department of Water and Environmental Regulation (formerly Office of the Environmental Protection Agency) (State)
- Department of State Development (State)
- Department of the Environment and Energy (Commonwealth).

1.5.2 Stakeholder Log

Table 1-3 summarises the consultation undertaken specific to this Plan.

Table 1-3: Consultation Summary

Stakeholder	Date	Summary of Consultation	Objections / Claims Raised	Chevron Australia Response
Department of Biodiversity, Conservation and Attractions	16 February 2017	Provision of project-specific information	No response provided	N/a
Department of Water and Environmental Regulation	16 February 2017	Provision of project-specific information	No response provided	N/a
Department of the Environment and Energy	16 February 2017	Provision of project-specific information	No response provided	N/a
Department of State Development	16 February 2017	Provision of project-specific information	None identified	N/a

1.5.3 Ongoing Consultation

Chevron Australia will continue to provide updates regarding Gorgon Operations at regular meetings with these stakeholders.

2.0 Description of the Activity

The well intervention and maintenance activities associated with the CO_2 Injection System Wells includes:

- Well intervention activities (described in Section 2.2):
  - slickline / wireline operations – for purposes of logging, remediation, depth determination and other wellbore services
  - well testing and flowback – may include flowing wells during the Operations phase (not currently scheduled but there is potential for ad hoc short-duration well flowback activities)
  - well workovers – may include removal and replacement of production tubing
- Well maintenance activities (described in Section 2.3):
  - may include valve greasing, function testing, pressure testing, and other maintenance as required.

2.1 Carbon Dioxide Injection System Overview

An overview of the drill centres (DCs) is provided in Table 2-1.

Table 2-1: Overview of Drill Centres and their Purpose

Drill Centre	Purpose
CO_2 injection drill centres (DC-A, DC-B, and DC-C)	The CO_2 injection wells located in DC-A, DC-B, and DC-C receive reservoir CO_2 from the pipeline offtakes for injection into the Dupuy Formation. Each DC comprises a central manifold connected by flowlines to 'Christmas tree' structures on multiple injection wells. DC-A and DC-C each have a reservoir surveillance well to monitor the CO_2 saturation and movement in the injection interval.
Pressure management drill centres (DC-D and DC-E)	Each pressure management DC has two pressure management production wells connected by spools to one water injection well, each capable of pumping up to 3180 m^3 of formation water per day. Pressure management production wells extract water from the Dupuy Formation. This water is then transferred to the injection wells where it is treated and injected into the Barrow Group Flacourt Formation.
CO_2 data well site	An existing CO_2 Data Well has been converted from a geological appraisal well, to a well that can measure pressure in the overlying Barrow Group and also detect microseismic events.

Table 2-2 lists the well identifiers, well types, as-built geographic coordinates, and well depths.

Table 2-2: Well Identifiers, Types, and Locations

DC	DC Footprint	Well	Well Type	Latitude	Longitude
A	1.3488	A-I1	CO_2 injection	-20.774858	115.451294
		A-I2	CO_2 injection	-20.774799	115.451299
		A-RS1	Reservoir Surveillance	-20.774739	115.451303
B	1.4014	B-I3	CO_2 injection	-20.754489	115.450931
		B-I4	CO_2 injection	-20.754431	115.450922

DC	DC Footprint	Well	Well Type	Latitude	Longitude
		B-I5	CO_2 injection	-20.754372	115.450914
		B-I6	CO_2 injection	-20.754314	115.450906
C	1.4012	C-I7	CO_2 injection	-20.730472	115.451228
		C-I8	CO_2 injection	-20.730414	115.451225
		C-I9	CO_2 injection	-20.730356	115.451219
		C-RS2	Reservoir Surveillance	-20.730531	115.451233
D	1.2443	D-WP1	Pressure Management (Production)	-20.728372	115.417386
		D-WP2	Pressure Management (Production)	-20.728294	115.417435
		D-WI1	Pressure Management (Injection)	-20.72845	115.417337
E	0.951	E-WP3	Pressure Management (Production)	-20.768232	115.407745
		E-WP4	Pressure Management (Production)	-20.768231	115.40765
		E-WI2	Pressure Management (Injection)	-20.768233	115.407842
CO_2 Data Well site	1.0184	GDW-1ST1	Reservoir Surveillance	Well site Coordinates -20.754061	Well Site Coordinates 115.445833

2.1.1 Timing

Well intervention and maintenance activities may occur at any time from EP acceptance, and occur for the nominal operational design life (minimum 45 years).

2.2 Well Intervention Activities

Well intervention activities are generally defined as invasive activities or activities that occur within the wellbore. These activities include:

- slickline / wireline operations
- well testing and flowback
- well workovers.

No well interventions are planned to be undertaken; they are generally only required if equipment is underperforming or defective. It is estimated that intervention on a single

well may be required once a year; however, it may be more frequent depending on well performance.

2.2.1 Slickline / Wireline Operations

In slickline / wireline operations, a wire (slickline) or braided cable (wireline) is lowered into the well to run tools in and out of the wellbore.

Before conducting these operations and entering the wellbore, pressure control equipment is rigged up and pressure tested to ensure that control of the well is maintained once it is opened. All slickline / wireline operations occur within the contained environment of the wellbore.

Generally, onshore slickline / wireline operations are conducted from a diesel truck (not a workover rig) modified to deploy either slickline and wireline cables. However, in some instances (such as the need to complete a well workover), slickline / wireline operations may be completed by a workover rig.

2.2.2 Well Testing and Flowback

As of publication of this Plan, Chevron Australia has no plan to conduct scheduled well testing or well flowback tasks; however, these tasks may need to be done depending on the results of the maintenance program or well performance. For the purposes of this Plan, the types of tasks associated with well testing and flowback include:

- wellbore clean-up
- venting of CO_2
- venting of hydrocarbon gas
- production of formation water
- well reinstatement (return to operations).

Where formation fluids are produced to surface during well testing or flowback activities, the flow stream may be routed through a solids removal package. This package would likely comprise a hydro-cyclone unit with solids collection bins and / or filtration units. The purpose of the solids removal package would be to remove solids and direct the solids-free fluid to downstream facilities such as separator vessels or tanks. The solids-free fluid stream may be directed to, or pumped into, an available water injection well for periods of extended well test or flowback.

2.2.3 Well Workovers

Well workovers are required if tubing must be pulled from the well and replaced. For the purposes of this Plan, a workover may be required if:

- there was a failure of the CO_2 tubing resulting in the loss of CO_2 into the annulus
- the upper completion is damaged due to corrosion
- the electrical submersible pumps attached to the water production tubing on the pressure management production wells are damaged or need to be replaced.

If production tubing needs to be replaced, the production packers are detached and the tubing is pulled. Then the well is cleaned using a brine that may include several chemicals (e.g. biocide, surfactant). Once clean, new tubing is installed and various completion equipment (such as downhole gauges, a tubing-retrievable safety valve, production packer to anchor the tubing, gas lift mandrel, or electrical submersible pump) will be run in the production tubing string.

Before reinstating the well, the contents of the wellbore (brine) are recirculated and stored in portable storage tanks.

2.3 Well Maintenance Activities

Well maintenance mainly comprises routine preventative maintenance tasks, which include (but are not limited to):

- greasing valves
- pressure testing valves
- opening and closing valves.

Each well is expected to require annual preventive maintenance. The duration of maintenance activities is estimated to be two days per well, which, given the number of wells, equates to a duration of approximately five weeks per year when maintenance activities covered under this Plan will be undertaken.

If preventative maintenance identifies the need for wellhead components to be replaced, this task may also be undertaken.

3.0 Description of the Environment

The potential extent of the environmental aspects and impacts arising from planned activities during the commissioning, start-up, operation, and IMR of the CO_2 Pipeline and Wells is expected to be limited to the Operational Area (see Section 3.2.4).

However, the potential extent of the environmental aspects and impacts arising from unplanned events or from infrequent and non-routine activities may have a localised effect on the land environment immediately adjacent to the Operational Area, as described and risk assessed in Section 0.

The description of the environment is structured as follows:

- Barrow Island conservation status (Section 3.1)
- the physical environment of Barrow Island (Section 3.2)
- the environment associated with the Operational Area where planned activities occur (Section 3.2.4)
- the environment associated with land adjacent to the Operational Area that may be affected if an unplanned event occurs (Section 0).

3.1 Barrow Island Conservation Status

Barrow Island is reserved under the *Conservation and Land Management Act 1984* (WA) as a Class A Nature Reserve for the purpose of conservation of flora and fauna.

3.2 Physical Environment of Barrow Island

3.2.1 Climate

Barrow Island is characterised by an arid subtropical climate with daytime temperatures ranging from 20 to 34 °C in summer, and from 17 to 26 °C in winter (Ref. 1). Average annual rainfall at Barrow Island is 318 mm with most rain (85%) occurring between January and July (Ref. 1). Rainfall is generally associated with tropical cyclones, which may occur between November and April. Between 1960 and 2003, an average 3.84 cyclones passed within 400 nm of Barrow Island each year (Ref. 2).

3.2.2 Geology, Landform and Soils

The surface geology of Barrow Island generally comprises calcarenite and limestone overlain by alluvium, colluvium, and aeolian sand. Tertiary limestone ridges occur throughout the central upland plateaus of Barrow Island. The terrain ranges from steeper slopes in the west, to flatter, more gentle undulations as the ridges continue east (Ref. 1). Soil types are highly variable, ranging from 'silty clays' and 'clayey loam' textures in western parts of Barrow Island to coarser 'clayey sands', 'sandy loams' and 'sandy clays' dominating towards the east (Ref. 3).

3.2.3 Hydrogeology

The surface hydrology on Barrow Island is characterised by run-off and short-term standing water after rainfall events, high rates of evaporation, and high infiltration capacities of the surface sands and limestone (Ref. 1). The Operational Area traverses several highly seasonal drainage lines, which generally align in a west-east orientation, but does not cross any permanent watercourses (Ref. 1). All watercourses are ephemeral and typically only flow for short periods following high-intensity rainfall, such as that associated with severe storms or cyclones (Ref. 1).

There is one shallow unconfined potentially fresh water aquifer on Barrow Island. This fresh water aquifer forms a lens of relatively fresh groundwater at depths typically between 9 m and 53 m, and floats upon denser, saline groundwater located

predominantly within the Tertiary Limestone (Ref. 2). Although beneficial uses of this fresh water aquifer are limited, it is an important environment for the stygofauna identified on Barrow Island.

Salinity of the water in this lens varies considerably across Barrow Island. Recharge to the aquifer is from rainfall and occurs most rapidly in areas of highly permeable soils overlying porous karst limestone. Lower salinities occur in areas of more rapid groundwater recharge. Higher salinities occur where recharge is slower, generally in areas where clays and silts are overlying the more porous and permeable limestone.

Salinity of the lens is also higher in coastal areas where seawater influx occurs close to the surface of the water-table.

Several saline ground water systems occur on Barrow Island:

- Tertiary Limestone extending from the mean sea level down to approximately 300 m below mean sea level
- Windalia Sand Member of the Muderong Shale, generally at depths between 650 m and 700 m below mean sea level
- the Barrow Group comprising the Flacourt and Malouet Formations and the Flag Sandstone, generally at depths between 1000 m and 2000 m below mean sea level
- the Dupuy Formation, generally at depths between 2000 m and 2300 m below mean sea level
- the Biggada Formation generally at depths greater than 3000 m below mean sea level.

The Dupuy Formation and Barrow Group systems are described in more detail below.

3.2.3.1 Barrow Group Formation

The Barrow Group Formation is an underground saline aquifer situated at depths between 1200 m and 1900 m below the surface; it is divided into three separate formations—the Flacourt Formation, Malouet Formation, and Basal Barrow Group Shale (Figure 3-1). The Flacourt Formation is the proposed receiving interval for the produced Dupuy Formation water in the pressure management system. The Flacourt Formation is a saline aquifer situated at depths approximately 1200 m in true vertical depth. This Formation comprises sandstone-dominated sandstone/shale sets. Of the core data points taken for the Barrow Group Flacourt Formation, high formation quality was exhibited (Ref. 4).

The underlying Malouet Formation also comprises interbedded sands and shales, although the reservoir quality is not as high as the Flacourt. A pressure baffle within the Malouet Formation hydraulically separates the Lower Malouet Formation from the rest of the Barrow Group. This zone is monitored for pressure changes in the Gorgon CO_2 Data Well. At the base of the Barrow Group is the Basal Barrow Group Shale, which is the top seal (cap rock) for the underlying Dupuy Formation, and hence is the seal for the injected reservoir CO_2.

The components of the upper Barrow Group (Flacourt and Upper Malouet Formations) behave as a single, hydraulically connected unit; however, the Barrow Group Formation is hydraulically separated from the shallow unconfined Tertiary Limestone by a thick sequence (more than 1000 m) of low permeability material (Ref. 4). Water quality is highly alkaline and saline (Total Dissolved Solids [TDS] approximately >30 000 mg/L), and contains hydrocarbons. It is generally characterised as containing stable minerals with a very low proportion of soluble metals.

A thick sequence of low permeability material (Muderong Shale and Gearle Siltstone) hydraulically separates the Barrow Group from the surface groundwater aquifer. The shallow unconfined aquifer forms a lens of fresher groundwater floating upon the denser, more saline sea water. Seasonal fluctuations in rainfall and tidal influence affect

this boundary between the fresh and saline water making it a transition zone, rather than a clear boundary (Ref. 5).

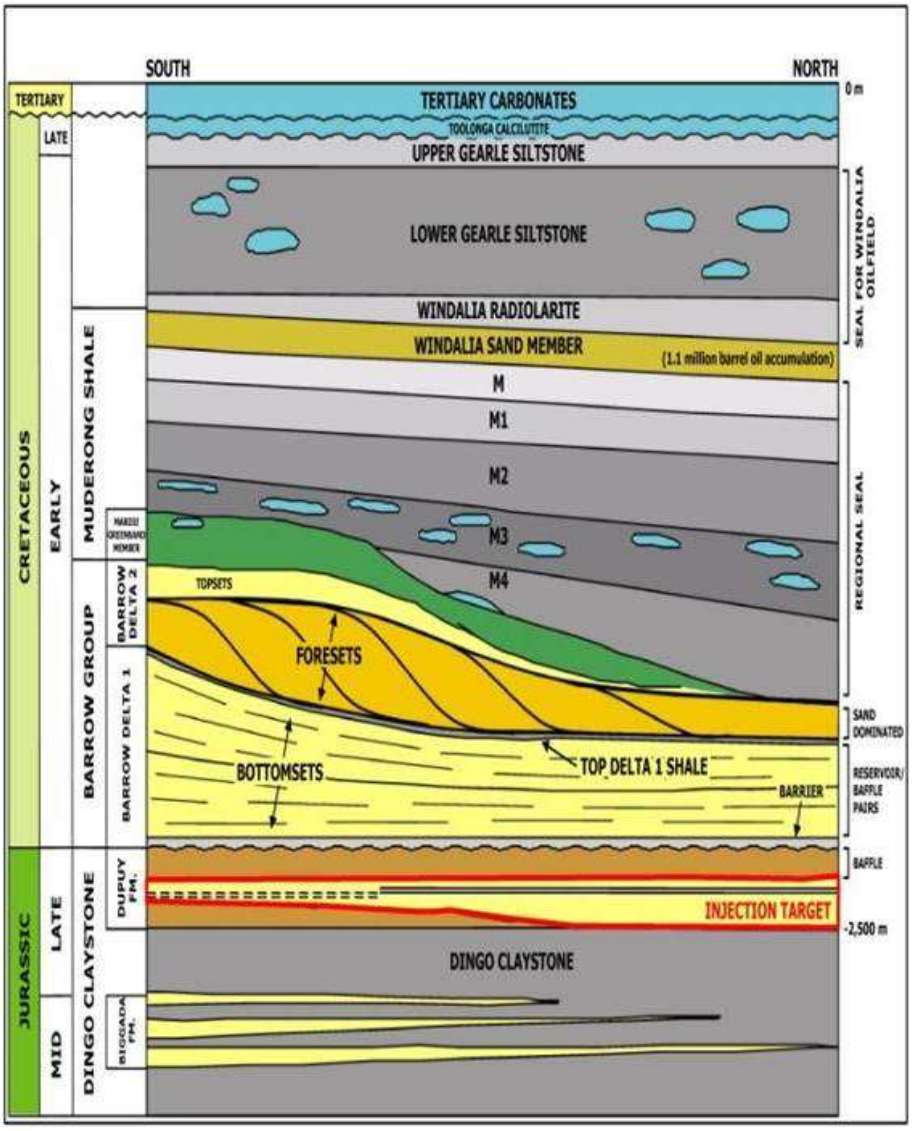

Figure 3-1: Hydrogeological Formations on Barrow Island

3.2.3.2 Dupuy Formation

Water produced from the Dupuy Formation is brackish (approximately 5000–6000 mg/L sodium chloride; 7000–8000 ppm TDS), and may occur at temperatures up to approximately 100 °C upon release (Ref. 6). Trace levels of naturally occurring dissolved hydrocarbons and metals have been identified in the formation water.

3.2.4 Surface water

All drainage lines on Barrow Island are ephemeral and typically only flow for short periods of time following high intensity rainfall such as that associated with storms or cyclones. Operational experience suggests these drainage lines are likely to be inundated between 3-7 days, depending on rainfall.

3.3 Operational Area

The Operational Area comprises land that was cleared and disturbed during construction and installation activities. Consequently, the particular values and sensitivities associated with the Operational Area are limited.

3.3.1 Terrestrial Flora and Vegetation

No particular flora and vegetation values or sensitivities are located within the Operational Area. All flora and vegetation within the Operational Area were cleared during construction. Weed species, including Buffel Grass, have been recorded in various locations on Barrow Island and Chevron Australia has established Weed Hygiene Zones (WHZs) for management purposes, including areas that transect the Operational Area.

3.3.2 Ecological Communities

No Threatened Ecological Community, as listed in the Parks and Wildlife's Threatened Ecological Database (Ref. 7), has been recorded or is known to occur on Barrow Island.

Barrow Island is recognised as being of high conservation significance for subterranean fauna communities, with 19 troglofauna and 63 stygofauna species recorded to date. Ten subterranean fauna species recorded on Barrow Island are listed as specially protected fauna under the *Biodiversity Conservation Act 2016* (WA) and two species, the Blind Gudgeon fish *Milyeringa justitia* (*M. veritas*) and Blind Cave Eel *Ophisternon candidum*, are listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act). Barrow Island subterranean fauna communities are listed by Parks and Wildlife as a Priority 1 Ecological Community ('not adequately defined').

Preliminary geological reviews suggest that strata on Barrow Island (e.g. interbedded sand/limestone) are relatively continuous (Ref. 8), and it is expected that if subterranean fauna occur beneath the Operational Area, it would be of no greater significance to that present elsewhere on Barrow Island. Subterranean fauna is known to exist up to approximately 50 m below ground level. Shallow surface formations and the watertable identified as subterranean fauna habitat are geologically isolated from the deeper formations.

3.3.3 Significant Fauna Habitats

The Operational Area was cleared during construction and does not provide any habitats of particular value or sensitivity.

3.3.4 Terrestrial Fauna

In the absence of fauna habitats of particular value or sensitivity, the Operational Area does not specifically support terrestrial fauna values, although mobile and transient fauna may be encountered in the Operational Area, including mammal, bird, and reptile species.

Four resident mammal species that may be encountered in the Operational Area are listed as specially protected fauna under the *Biodiversity Conservation Act 2016* (WA) or listed as Vulnerable under the EPBC Act. They are Barrow Island Euro *Macropus robustus isabellinus*, Spectacled Hare-wallaby *Lagorchestes conspicillatus conspicillatus*, Barrow Island Golden Bandicoot *Isoodon auratus barrowensis*, and Boodie *Bettongia lesueur*. All these species are widespread across Barrow Island.

Barrow Island supports numerous species of migratory shorebirds as well as resident shorebirds. Many of these species are protected under International treaties (e.g. JAMBA, CAMBA, ROKAMBA). Barrow Island is both a staging site and an important non-breeding site for migratory shorebirds. The highest abundance of shorebirds on Barrow

Island, with over two-thirds of records for most species, is associated with the south-eastern and southern coasts of the Island.

All avifauna with the potential to be encountered in the Operational Area occur widely across Barrow Island. The most common terrestrial avifauna species that have the potential to be encountered are the Spinifex-bird *Eremiornis carteri*, White-winged Fairy-wren (Barrow Island) *Malurus leucopterus edouardi*, Singing Honeyeater *Lichenostomus virescens*, White-breasted Wood Swallow *Artamus leucorhynchus*, and the Welcome Swallow *Hirundo neoxena* (Ref. 1). The White-winged Fairy-wren (Barrow Island) is the only terrestrial bird species on Barrow Island to be listed as Vulnerable under the *Biodiversity Conservation Act 2016* (WA) and the EPBC Act (Ref. 1), but the species is abundant in most habitats on Barrow Island (Ref. 1; Ref. 9) Other listed terrestrial avifauna species with the potential to be encountered in the Operational Area include four vagrant or migratory species protected under international agreements (Oriental Cuckoo *Cuculus saturatus*, Fork-tailed Swift *Apus pacificus*, White-throated Needletail *Hirandapus caudacutus*, and Yellow Wagtail *Motacilla flava*) and the Australian Bustard *Ardeotis australis*, which is listed by Parks and Wildlife as a Priority 4 species ('rare, near-threatened and other species in need of monitoring') (Ref. 1).

Reptile species also have the potential to be encountered in the Operational Area, although all species are abundant and widespread on Barrow Island, and none are listed as threatened under the *Biodiversity Conservation Act 2016* (WA) or the EPBC Act (Ref. 1).

3.3.5 Cultural Heritage

Cultural heritage surveys have not identified any cultural heritage sites or materials within the Operational Area.

3.3.6 Petroleum Activities and Infrastructure

Barrow Island has been actively used for petroleum exploration and production activities since 1957 and access is restricted to personnel associated with the oilfield operations, the Gorgon Gas Development, and Parks and Wildlife staff. Infrastructure associated with the Gorgon Gas Development Project, and the Barrow Island oil field road network traverse the Operational Area and adjacent land.

The Barrow Island oil field extracts crude oil, water and gas from the Windalia, Mardie B, M3, Gearle, Jurassic, Malouet and Tunney Formations on Barrow Island. Formation water for pressure management is extracted from Barrow Group Flacourt Formation, processed then injected into the Windalia Formation. Formation water is re-injected into the Windalia reservoir and also disposed of to the Barrow Group Flacourt Formation.

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4.0 Environmental Risk Assessment Methodology

An Environmental Risk Assessment Workshop was undertaken to evaluate impacts and risks arising from the petroleum activities described in Section 2.0. The risk assessment also considered emergency conditions and spill response activities.

The risk assessment was undertaken in accordance with the Chevron Australia Health, Environment, and Safety (HES) Risk Management Process (Ref. 10) and the processes outlined in ISO 31000:2009 Risk Management – Principles and Guidelines and Handbook 203:2012 Managing Environment-related Risk (Ref. 11).

The environmental impact and risk evaluation process comprised these components:

- identification and description of the petroleum activity
- identification of particular environmental values
- identification of relevant aspects
- identification of relevant environmental hazards
- exposure evaluation
- evaluation of impacts and risk
- consequence
- control measures and as low as reasonably practicable (ALARP) evaluation
- likelihood
- quantification of the level of risk
- risk acceptance criteria
- environmental performance objectives, standards, and measurement criteria.

Table 4-1 summarises the environmental impacts, risks, and control measures in place to manage the activity.

Table 4-1: Summary of the Potential Impacts Risks and Control Measures

Source of Environmental Impact or Risk (Hazards)	Potential Environmental Impacts and Risks (Consequences)	Control Measures
Well intervention activities have the potential to result in a leak of reservoir CO_2	A release of CO_2 has the potential to result impacts such as: • localised asphyxiation hazard to terrestrial fauna if CO_2 settles temporarily in low-lying areas • acute impacts to birds if they are exposed to the CO_2 plume.	• Pressure control equipment is in place for all well intervention activities • Pressure control equipment will be tested prior to well entry • A fluids program will be developed for well intervention activities to ensure well control is maintained • WSM and DSM are trained in well control. • Well Intervention Procedure will be developed. • Each 'well program' (program of works for the specified activity) includes a risk assessment that identifies loss of containment from contact with infrastructure.

Source of Environmental Impact or Risk (Hazards)	Potential Environmental Impacts and Risks (Consequences)	Control Measures
Well intervention activities have the potential to result in a leak of formation water	A release of higher-temperature brackish Dupuy Formation water has the potential to result in localised impacts to seasonal drainage line vegetation, and to sensitive fauna if present	• Pressure control equipment is in place for all these well intervention activities • Pressure control equipment will be tested prior to well entry • A fluids program will be developed for well intervention activities to ensure well control is maintained. • Well Site Managers (WSM) and Drill Site Managers (DSM) are trained in well control • Well Intervention Procedure will be developed. • Each 'well program' (program of works for the specified activity) includes a risk assessment that identifies loss of containment from contact with infrastructure. • The Gorgon Operations –Procedure for Use of Spill Kits Located in Gorgon Operations Areas (Ref. 12) is used for informing spill clean-up and reporting.

Removal of well cellar coverings to complete well intervention activities has the potential to result in fauna entrapment	Fauna injury or mortality	• Each 'well program' (program of works for the specified well intervention activity) will include a risk assessment that identifies risks associated with fauna entrapment in well cellars
		• Fauna Handling Common User Procedure (Ref. 13). Specifically:
		  ○ trained fauna handler
		  ○ death of EPBC Act listed species reported to Department of the Environment and Energy

Source of Environmental Impact or Risk (Hazards)	Potential Environmental Impacts and Risks (Consequences)	Control Measures
Well testing, flowback, or blowdown will result in the release of CO_2 or hydrocarbon gas	A release of CO_2 or hydrocarbon gas has the potential to result impacts such as: • acute impacts to birds if they are exposed to the CO_2 or hydrocarbon gas plume.	• Design of CO_2 vents optimised to increase dispersion • Hydrocarbon gas emissions during venting estimated in quarterly emissions and discharges report.
Generation of formation water during flowback or Brine during well clean-up if not managed on site may be accidentally spilled	A release of higher-temperature / brackish water has the potential to result in localised impacts to seasonal drainage line vegetation, and sensitive fauna if present.	• Spill protection will be provided for portable tanks and transfer lines will comprise secondary containment • Each 'well program' (program of works for the specified activity) includes a risk assessment that identifies loss of containment from contact with infrastructure. • The Gorgon Operations –Procedure for Use of Spill Kits Located in Gorgon Operations Areas (Ref. 12) is used for informing spill clean-up and reporting • Wellbore clean-up procedure incorporates fluids management / handling

Operation of a solids removal package at the Pressure Management Drill Centres has the potential to result in a leak or spill of hazardous materials	A release of solid material (which may contain hydrocarbon and heavy metals) has the potential to result in localised impacts to terrestrial flora and fauna.	• Leak testing conducted in accordance with industry standards is carried out on the solids removal equipment, prior to operation of equipment commencing
		• Solid hazardous materials will be stored, handled and transferred appropriately, including where required:
		  ○ having secondary containment for the hydro-cyclone unit bins, tanks and hose connections
		  ○ relevant stationary equipment which contains hazardous materials, such as diesel generators will be self-bunded
		  ○ use of spill protection during transfer
		• Equipment and machinery will be maintained, as per manufacturer specifications
		• Spills will be contained and cleaned up in accordance with the Gorgon Operations - Procedure for use of Spill Kits Located in Gorgon Operations Areas (Ref. 12)

Source of Environmental Impact or Risk (Hazards)	Potential Environmental Impacts and Risks (Consequences)	Control Measures
Well testing, flowback, or blowdown will result in the release of CO_2	Noise generated from the release of CO_2 has the potential disturb sensitive terrestrial fauna during breeding periods.	• Design of CO_2 vents is optimised to reduce noise emissions

Operating vehicles, equipment, and rigs within the drill centers requires the use and storage of hazardous materials, and chemicals	Contamination within the Operational Area may result in subsequent impacts to stygofauna if these materials reach the groundwater.	• Bulk fuel tanks will have secondary containment
		• No chemicals and hazardous substances required for well intervention or maintenance activities will be stored within the operational area upon completion of activities under this Plan.
		• All hazardous liquids will have secondary containment.
		• All hazardous materials will be stored appropriately.
		• All hazardous materials will be transferred appropriately.
		• Stationary equipment (e.g. generators, pumps) will have spill protection
		• For the bulk transfer of fuel:
		  ○ transfer hoses are fitted with dry-break couplings
		  ○ spill protection (e.g. drip trays) is in place before refuelling commences.
		• Personnel responsible for procuring hazardous materials will complete ABU - ChemAlert HES Reviewer and Authoriser Training
		• At least one hazardous chemical spill exercise will be conducted during each well program
		• The Gorgon Operations Procedure for Use of Spill Kits Located in Gorgon Operations Areas (Ref. 12) is used for informing spill clean-up and reporting

Operating vehicles, equipment, and rigs within the drill centers has the potential to create a vehicle strike hazard	Fauna strike may result in injury or mortality	• Traffic Management Common User Procedure (Ref. 14). Specifically:
		  ○ driver requirements before driving on Barrow Island are met
		• Fauna Handling Common User Procedure (Ref. 13). Specifically:
		  ○ trained fauna handler
		  ○ death of EPBC Act listed species reported to Department of the Environment and Energy

Source of Environmental Impact or Risk (Hazards)	Potential Environmental Impacts and Risks (Consequences)	Control Measures
Operating vehicles, equipment, within the drill centers has the potential to result in a collision with the well causing a release of hydrocarbon gas	A release of hydrocarbon gas has the potential to result impacts such as: • acute impacts to birds if they are exposed to the hydrocarbon gas plume.	• Vehicle barrier at well site • 15m exclusion zone around the wellheads (PTW requirements apply)
Operating vehicles, equipment, within the drill centers has the potential to result in a collision with the well causing a release of hydrocarbon gas which if accidentally ignited during the collision could result in a fire event	A fire event may cause various environmental consequences including habitat and vegetation loss, fauna mortality and contamination.	• Vehicle barrier at well site • 15m exclusion zone is around the wellheads (PTW requirements apply to this area) • Fire Management Plan

5.0 Management Approach

The implementation strategy in the EMP identifies the systems, practices, and procedures used to ensure the environmental impacts and risks of the activities are continuously reduced to ALARP and the environmental performance outcomes and standards are met. These are predominantly driven through Chevron Australia's Operational Excellence Management System (OEMS).

5.1 Operational Excellence Management System

The implementation strategy of the EMP was developed in line with Chevron Australia's OEMS. Chevron's Operational Excellence Management System is aligned to ISO 14001:2004; Table 5-1lists the key components.

Table 5-1: OEMS Elements Relevant to the Activity

OEMS Element	Element Description	Key Processes Relevant to the Activity
Safe Operations (OE-03)	Operate and maintain facilities to prevent injuries, illness, and incidents	• (OE-03.01.01) ABU HES Risk Management (Ref. 10) • (OE-03.09.01) Marine Safety Reliability and Efficiency – ABU Standardised OE Process (Ref. 15) • (OE-03.06.02) Managing Safe Work – ABU Standardised OE Process (Ref. 16)
Management of Change (OE-04)	Manage both permanent and temporary changes to prevent incidents	• (OE-04.00.01) Management of Change for Facilities and Operations – ABU Standardised OE Process (Ref. 17)
Reliability and Efficiency (OE-05)	Ensure the integrity and availability of wells and facilities, and to prevent incident	• Competency Management System
Incident Investigation (OE-09)	Investigate and identify root causes of incidents to reduce or eliminate systemic causes to prevent future incidents	• (OE-09.00.01) Incident Investigation and Reporting – ABU Standardised OE Process (Ref. 18)
Community and Stakeholder Engagement (OE-10)	Reach out to the community and engage in open dialogue to build trust	• (OE-10.00.01) Community and Stakeholder Engagement – ABU Standardised OE Process (Ref. 19)
Emergency Management (OE-11)	Prevention is the first priority, but be prepared to respond immediately and effectively to all emergencies involving wholly owned or operated Chevron assets	• (OE-11.01.01) Emergency Management Process (Ref. 20) • (ABU-COP-00632) Emergency Response Plan for Barrow Island (Ref. 21)
Compliance Assurance (OE-12)	Verify conformance with OE requirements in applicable company policy and government laws and regulations	• ABU OE Assurance Process (OE-12.01.01; Ref. 22) • ABU OE Assurance Plan (Ref. 24) • Gorgon OE Assurance Plan (Ref. 23)

5.2 Environment Plan Review

Regulation 18 of the Petroleum Pipelines (Environment) Regulations and Condition 7.5 of the Pipeline Licence (PL93) require that Chevron Australia submit a proposed revision of the accepted EMP to the Minister:

- before commencing a new activity
- before any significant modification or change, or a new stage of an existing activity
- before, or as soon as practicable after, any significant new environmental impact or risk occurs, or any significant increase in an existing environmental impact or risk which occurred or is to occur.

Additionally, Regulation 20 of Petroleum Pipelines (Environment) Regulations and Condition 7.6 of PL93 require that Chevron Australia submit a proposed revision of the EMP five years from the date when the EMP is accepted by the Minister.

6.0 Chemical Disclosure

To meet the DMIRS requirements regarding *chemical disclosure*, this Section details the chemicals and any chemical additives that will be introduced into the CO2 injection system pressure management wells. MSDSs are included as Appendix A

6.1 MI SWACO

6.1.1 System Details

OPERATOR:	Chevron Australia PTY LTD
PROJECT / WELL:	Barrow Island CO_2 Completions
SYSTEM:	Inhibited Completion Fluids
Total Volume of System	300 m^3

6.1.2 Product List Details

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
Water	N/A	Base Fluid	~74		
SAFE-SCAV CA	MI SWACO	Oxygen Scavenger	<0.1%	Acute Toxicity: Bisulfites may cause skin and respiratory sensitization in sulfite sensitive persons. May also cause respiratory sensitization in asthmatics. *Sulfur dioxide:* = 2500 ppm LC50 Inhalation (Rat) 1h Chronic Toxicity: Repeated or prolonged contact may cause allergic reactions in very susceptible persons. EcoToxicity: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Biodegradation/Bioaccumulation: Not applicable - Inorganic chemical	Y
Potassium Chloride	M-I Swaco	Brine	~26	Acute Toxicity: = 3 g/kg LD50 Oral (Rat) > 10g/kg LD50 Dermal (Rabbit) > 42 g/m3 LC50 Inhalation (Rat) 1h Ecotoxicity: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. 5560 - 6080 mg/L LC50 (Lepomis macrochirus) = 96 h 12946 mg/L LC50 (Lepomis macrochirus) = 96 h 4747 - 7824 mg/L LC50 (Oncorhynchus mykiss) = 96 h 7050 mg/L LC50 (Pimephales promelas) = 96	Y

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
				h 6420 - 6700 mg/L LC50 (Pimephales promelas) = 96 h 6020 - 7070 mg/L LC50 (Pimephales promelas) = 96 h 340.7 - 469.2 mg/L EC50 (Daphnia magna) = 48 h 1000 mg/L EC50 (Daphnia magna) = 48 h Biodegradation/Bioaccumulation: Degradability not applicable- Inorganic material. Does not bioaccumulate.	
CONQOR 303A	MI SWACO	Corrosion Inhibitor	<1	Acute Toxicity: = 5000 mg/kg LD50 Oral (Rat) > 2000 mg/kg LD50 Dermal Chronic Toxicity: May cause sensitization by skin contact Ecotoxicity: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Algae: > 100 mg/L EC50 72h Fish: >100 mg/L LC50 96h Daphnia and other aquatic invertebrates: > 100 mg/L EC50 48h Biodegradation/Bioaccumulation: Product is biodegradable. No bioaccumulation expected due to high molecular weight.	Y
NUOSEPT 78	TROY CORPORATION / Mi Swaco (Renaming of product by MI to NUOSPET 78)	Preservative	<0.05	Acute Toxicity: > 2000 mg/kg LD50 Dermal (Rat) 1009 to 3950 mg/kg LD50 Oral (Rat- female) Chronic Toxicity: Eyes (Rabbit) - Cornea opacity - 21 days - score 59 Skin (Rabbit) - mild irritant Skin (Mouse) - sensitizing Ecotoxicity: 10 - 100 mg/L Acute EC50 (Daphnia) 48 h 10 - 100 mg/L Acute LC50 (Fish) 96 h Biodegradation/Bioaccumulation: Product readily biodegradable. Low Potential to bioaccumulate.	Y
SODA ASH	MI SWACO	pH Modifier	<0.1	Acute Toxicity: = 4090 mg/kg LD50 Oral (Rat) Ecotoxicity: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. 300 mg/L LC50(Lepomis macrochirus) = 96 h 310 - 1220 mg/L LC50 (Pimephales promelas) = 96 h 242 mg/L EC50 (Nitzschia) = 120 h	Y

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
				265 mg/L EC50 (Daphnia magna) = 48 h Biodegradation/Bioaccumulation: Not applicable - Inorganic chemical	
Total			**~100%**		

6.1.3 Chemical List

Chemicals within products in part 2	CAS Number	Mass Fraction (%)
Water (Including Mix Water Supplied by Client)*	7732-18-5	~ 74
Potassium Chloride Brine	7447-40-7	~ 26
Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivs. residues	68909-77-3	< 1
Sodium carbonate	497-19-8	< 0.1
2,3-didehydro-3-O-sodio-D-erythro-hexono-1,4-lactone	6381-77-7	< 0.1
Hexahydro-1,3,5-tris(2-hydroxyethyl)-sym-triazine	4719-04-4	< 0.1
2-aminoethanol	141-43-5	< 0.01
	Total	**~100**

6.2 Contingency Lost Circulation Pill

6.2.1 System Details Contingency Lost Circulation Pill

OPERATOR:	Chevron Australia PTY LTD
PROJECT / WELL:	BWI CO_2 Injection Wells
SYSTEM:	Contingency Lost Circulation pill – approx. 200 bbl (32 m^3)

6.2.2 Product List Details Inhibited P&A Fluids

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
Water	N/A	Base Fluid	~80		
Flo-Trol	MI Swaco	Fluid Loss	2- 3%	Acute Toxicity: Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system. Eye contact Dust may cause mechanical irritation. Skin contact Prolonged contact may cause redness and irritation. Ingestion Ingestion may cause stomach discomfort. Unknown acute toxicity Not applicable. Sensitization This product does not contain any components suspected to be sensitizing. Mutagenic effects This product does not contain any known or suspected mutagens. Ecotoxicity/Toxicity: The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Listed on PLONOR list of OSPAR Toxicity to algae This product is not considered toxic to algae. Toxicity to fish This product is not considered toxic to fish. Toxicity to daphnia and other aquatic invertebrates This product is not considered toxic to invertebrates. Biodegradable: Product is biodegradable.	Y
SAFE-CARB All Grades	MI Swaco	Bridging Agent	8 – 9%	Acute toxicity: Product information This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis. Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system. Harmful: danger of serious damage to health by	Y

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
				prolonged exposure through inhalation. Repeated or prolonged inhalation of crystalline silica dust can cause delayed lung injury, and other diseases, including silicosis and lung cancer. Eye contact Dust may cause mechanical irritation. Skin contact Prolonged contact may cause redness and irritation. Ingestion Ingestion may cause stomach discomfort. Sensitization Not classified. Mutagenic effects This product does not contain any known or suspected mutagens. Carcinogenicity Crystalline silica dust is listed by IARC in Group 1 as known to cause lung cancer in humans, if inhaled. Aspiration hazard Not applicable. Ecotoxicity/Toxicity: Toxicity to algae This product is not considered toxic to algae. Toxicity to fish This product is not considered toxic to fish. Toxicity to daphnia and other aquatic invertebrates This product is not considered toxic to invertebrates. Biodegradable: Not Applicable - Inorganic chemical	
Potassium Chloride	MI Swaco	Base Brine - Weight	6%	Acute toxicity: Inhalation of dust in high concentration may cause irritation of respiratory system. Toxicity/Ecotoxicity: The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Biodegradation/Bioaccumulation: No data available	Y
SAFE-SCAV CA	MI Swaco	Oxygen Scavenger	<0.1%	Acute toxicity: Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system. Eye contact Dust may cause mechanical irritation. Skin contact Prolonged contact may cause redness and irritation. Ingestion Ingestion may cause stomach discomfort. Unknown acute toxicity Not Applicable The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic	Y

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
				organisms. Listed on PLONOR list of OSPAR Toxicity/Ecotoxicity: Toxicity to algae This product is not considered toxic to algae. Toxicity to fish This product is not considered toxic to fish. Toxicity to daphnia and other aquatic invertebrates This product is not considered toxic to invertebrates Biodegradable: Not Applicable - Inorganic chemical.	
DUO-VIS	MI Swaco	Viscosity	<1%	Acute toxicity: Glyoxal LD50 Oral = 200 mg/kg (Rat) LD50 Dermal = 12700 mg/kg (Rabbit) LC50 Inhalation = 2410 mg/m³, 3-4 hrs Toxicity: Component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Glyoxal Toxicity to fish 460 - 680 mg/L LC50 Leuciscuidus 96 h = 215 mg/L LC50 Pimephales promelas 96 h Toxicity to algae <= 348.59 mg/L EC50 Pseudokirchneriella subcapitata 96h > 500 mg/L EC50 Desmodesmus subspicatus 96 h > 500 mg/L EC50 Desmodesmus subspicatus 72 h Toxicity to daphnia and other aquatic invertebrates = 404 mg/L EC50 Daphnia magna 48 h Biodegradation/Bioaccumulation: Not biodegradable/Does not bioaccumulate.	Y
NUO-SEPT 78	Troy	Biocide	< 0.5%	Acute Toxicity: > 2000 mg/kg LD50 Dermal (Rat) 1009 to 3950 mg/kg LD50 Oral (Rat- female) Chronic Toxicity: Eyes (Rabbit) - Cornea opacity - 21 days - score 59 Skin (Rabbit) - mild irritant Skin (Mouse) - sensitizing Toxicity/Ecotoxicity: 10 - 100 mg/L Acute EC50 (Daphnia) 48 h 10 - 100 mg/L Acute LC50 (Fish) 96 h Biodegradation/Bioaccumulation: Product readily biodegradable. Low Potential to bioaccumulate.	Y
Magnesium Oxide	MI Swaco	pH Control	< 0.5%	Acute toxicity: Inhalation Inhalation of dust in high concentration may cause irritation of respiratory system. Eye contact Dust may cause mechanical irritation. Skin contact Prolonged contact may cause redness and irritation. Ingestion Ingestion may cause stomach	Y

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS
				discomfort. Unknown acute toxicity Not Applicable The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms. Listed on PLONOR list of OSPAR Toxicity/Ecotoxicity: Toxicity to algae This product is not considered toxic to algae. Toxicity to fish This product is not considered toxic to fish. Toxicity to daphnia and other aquatic invertebrates This product is not considered toxic to invertebrates Biodegradable: Not Applicable - Inorganic chemical.	
Total			**~100%**		

6.2.3 Chemical List Inhibited Completion Fluid

Chemicals within products in part 2	CAS Number	Mass Fraction (%)
Water	7732-18-5	~ 80
Calcium carbonate	471-34-1	~ 9
Starch, 2-hydroxypropyl ether	9049-76-7	~ 3
Potassium chloride	7447-40-7	~6
Xanthan Gum	11138-66-2	< 1
2,3-didehydro-3-O-sodio-D-erythro-hexono-1,4-lactone	6381-77-7	< 1
Magnesium oxide	1309-48-4	< 1
Silica, crystalline, quartz	14808-60-7	< 0.1
Hexahydro-1,3,5-tris(2-hydroxyethyl)-sym-triazine	4719-04-4	< 0.1
Glyoxal	107-22-2	< 0.01
2-aminoethanol	141-43-5	< 0.01
Total		**100.00**

7.0 Acronyms and Abbreviations

Table 7-1 defines the acronyms and abbreviations used in this document.

Table 7-1: Acronyms and Abbreviations

Acronym/Abbreviation	Definition
°C	Degrees Celsius
ABU	Australian Business Unit
ALARP	As low as reasonably practicable
CCR	Central Control Room
Chevron Australia	Chevron Australia Pty Ltd
CO_2	Carbon dioxide
DC	Drill Centre
EMP	Environment Management Plan
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GGTP	Gorgon Gas Treatment Plant
GJV	Gorgon Joint Venture
HES	Health, Environment, and Safety
IMR	Inspection, Maintenance, and Repair
ISO	International Organization for Standardization
km	Kilometre
m	Metre
mg/L	Milligrams per litre
mm	Millimetre
nm	Nautical mile
OE	Operational Excellence
OEMS	Operational Excellence Management System
PEC	Priority Ecological Community
PGPA	Policy, Government and Public Affairs
ppm	Parts per million
PTW	Permit to Work
Q1, Q2,etc.	Three-month quarter of a calendar year
ROW	Right-of-Way
TDS	Total Dissolved Solids
WA	Western Australia
WHZ	Weed Hygiene Zone

8.0 References

Ref. No.	Document	Document No.
1.	Chevron Australia. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Environment Monitoring Program.* Perth, Western Australia.	GOR-COP-01696
2.	Chevron Australia. 2008. *Gorgon Gas Development Revised and Expanded Proposal: Public Environmental Review*. Perth, Western Australia.	
3.	Lewis, MM and Grierson, IT. 1990. *Land Units and Soils of Barrow Island.* Roseworthy Agricultural College, South Australia.	
4.	Gibson-Poole, CM. 2009. *Site Characterisation for Geological Storage of Carbon Dioxide: Examples of Potential Sites from the North West Shelf, Australia*. Doctoral dissertation, School of Petroleum, The University of Adelaide. Adelaide, South Australia.	
5.	Chevron Australia. 2015. *Gorgon Project: Liquid Waste Facility and Permanent Waste Disposal Wells Licence*. Perth, Western Australia.	
6.	Baker Petrolite. 2010. *Review of Scale , Corrosion and Production Chemical Risks: Gorgon Dupuy Depressurization Project*. Baker Hughes. BC-3009.	
7.	Department of Parks and Wildlife. *Threatened Ecological Database*. Available online https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities	
8.	Biota Environmental Sciences. 2007. *Barrow Island Gorgon Gas Development: Summary of 2004–2006 Subterranean Fauna Surveys*. Perth, Western Australia.	
9.	Bamford, AR and Moro, D. 2011. Nest Site Selection of the White-winged Fairy-wren *Malurus leucopterus edouardi* on Barrow Island. *Corella*, 35:3, pp. 84–86.	
10.	Chevron Australia. *Health, Environment, and Safety (HES) Risk Management Process*. Perth, Western Australia.	OE-03.01.01
11.	Standards Australia/Standards New Zealand. 2009. *ISO 31000:2009 Risk Management – Principles and Guidelines*. Sydney, Australia/Wellington, New Zealand.	
12.	Chevron Australia. *Gorgon Operations – Procedure for the Use of Spill Kits Located in Gorgon Operation Areas*. Perth, Western Australia.	GOR-COP- 0097
13.	Fauna Handling Common User Procedure	
14.	Traffic Management Common User Procedure	
15.	Chevron Australia. *Marine Safety Reliability and Efficiency – ABU Standardised OE Process*. Perth, Western Australia.	OE-03.09.01
16.	Chevron Australia. *Managing Safe Work (MSW) – ABU Standardised OE Process*. Perth, Western Australia.	OE-03.06.02
17.	Chevron Australia. *Management of Change for Facilities and Operations – ABU Standardised OE Process*. Perth, Western Australia.	OE-04.00.01
18.	Chevron Australia. *Incident Investigation and Reporting – ABU Standardised OE Process*. Perth, Western Australia.	OE-09.00.01
19.	Chevron Australia. *Community and Stakeholder Engagement – ABU Standardised OE Process*. Perth, Western Australia.	OE-10.00.01
20.	Chevron Australia. *Emergency Management Process– ABU Standardised OE Process*. Perth, Western Australia.	OE-11.01.01

Ref. No.	Document	Document No.
21.	Chevron Australia. *Gorgon Operations – Emergency Response Plan for Barrow Island*. Perth, Western Australia.	ABU-COP-00632
22.	Chevron Australia. 2018. *ABU – OE Assurance Corporate Process*. Chevron Australia, Perth, Western Australia	OE-12.01.01
23.	Chevron Australia. 2020. *Gorgon OE Assurance Plan*. Chevron Australia, Perth, Western Australia	ABU200901265
24.	Chevron Australia. *ABU OE Assurance Plan*. Perth, Western Australia.	ABU161100798

Appendix A Chemical Disclosure MSDSs

SDS no. MI10031
Version 10
Revision date 10-Mar-2015
Supersedes date 31-Jan-2012

Safety Data Sheet
CONQOR* 303A

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name CONQOR* 303A
Product code MI10031

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Corrosion inhibitor

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
ABN: 67 009 214 162
Level 5
256 St. George Tce
Perth
WA 6000
T = +61 08 9440 2900
F = +61 08 9322 3080
+47 51577424

MISDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

Netherlands	National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)

2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to (EC) No. 1272/2008

Health hazards

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Skin sensitization	Category 1

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements

SAFETY DATA SHEET
DUO-VIS*

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name DUO-VIS*

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Viscosifier

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

Manufacturer
M-I SWACO
A Schlumberger Company
Woodlands Drive
Kirkhill Industrial Estate
Dyce, Aberdeen AB21 0GW
Scotland UK
T=+44(0)1224-246600
F=+11(0)1224-246699

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (1999/45/EEC) Not classified.

2.2. Label elements

Risk Phrases

NC Not classified.

Safety Phrases

NC Not classified.

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

XANTHAN GUM	60-100%

Classification (EC 1272/2008)	Classification (67/548/EEC)
Not classified.	Not classified.

GLYOXAL	<1%
CAS-No.: 107-22-2	EC No.: 203-474-9

Classification (EC 1272/2008)	Classification (67/548/EEC)
Acute Tox. 4 - H332	Muta. Cat. 3;R68
Skin Irrit. 2 - H315	Xn;R20
Eye Irrit. 2 - H319	R43
Skin Sens. 1 - H317	Xi;R36/38
Muta. 2 - H341	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues. Do not induce vomiting.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

When heated, vapours/gases hazardous to health may be formed.

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

Specific hazards

Fire or high temperatures create: Vapours/gases/fumes of: Carbon dioxide (CO2). Carbon monoxide (CO).

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. In case of spills, beware of slippery floors and surfaces.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments

NUI = Nuisance dust, WEL TWA 4mg/m3 Respirable Dust, 10 mg/m3 Total Dust.
No biological limit allocated.

GLYOXAL (CAS: 107-22-2)

DNEL			
Dermal	Long Term	Systemic Effects	48 mg/kg
Inhalation.	Long Term	Systemic Effects	16.9 mg/m³
Inhalation.	Long Term	Local Effects	0.07 mg/m³
PNEC			
Freshwater	0.319 mg/L		
Marinewater	0.0319 mg/L		
Intermittent release	1.1 mg/L		
STP	4.1 mg/L		
Sediment (Freshwater)	0.685 mg/kg		
Sediment (Marinewater)	0.0685 mg/kg		
Soil	4.06 mg/kg		

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate general and local exhaust ventilation.

Respiratory equipment

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2).

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Butyl rubber or polyvinyl acetate.

Eye protection

Wear approved chemical safety goggles where eye exposure is reasonably probable.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Powder, dust
Colour	Cream to Tan
Odour	Characteristic.
Solubility	Completely soluble in water
Relative density	1.5 s.g @ 20°C
Bulk Density	650-850 kg/m3
pH-Value, Diluted Solution	7 @ 1 %
Auto Ignition Temperature (°C)	> 200°C

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Dust may form explosive mixture with air.

10.4. Conditions to avoid

Avoid dust formation. Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials To Avoid

Avoid contact with strong oxidisers.

10.6. Hazardous decomposition products

Fire or high temperatures create: Vapours/gases/fumes of: Carbon dioxide (CO2). Carbon monoxide (CO).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Toxic Dose 1 - LD 50

45 mg/kg (oral rat)

Toxic Dose 2 - LD 50

20 mg/kg (oral-mouse)

Toxic Conc. - LC 50

21 ppm/1h (inh-rat)

Toxicological information

*Based on components

Aspiration hazard:

Based on available data the classification criteria are not met.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May cause discomfort if swallowed.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Particles in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com.

12.1. Toxicity

Acute Toxicity - Fish

LC50 96 hours 420 mg/l Onchorhynchus mykiss (Rainbow trout)

12.2. Persistence and degradability

Degradability

Readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential

No bioaccumulation is expected.

12.4. Mobility in soil

Mobility:

The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

New Zealand Hazard Classification and HSNO Approval No.

Not Classified. HSNO Approval No. Not Required.

Name of Group Standard and Information on Conditions of Group Standard

Not applicable.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms used in the safety data sheet

*a mark of M-I L.L.C.

General information

HMIS Health - 2 HMIS Flammability - 1 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

Updated according to REACH Annex II. Compiled or revised by Sarah Malone

Issued By	Bill Cameron
Revision Date	08-Nov-2012
Revision	6
Supersedes date	18-May-2010
SDS No.	10216

Risk Phrases In Full

R20	Harmful by inhalation.
R36/38	Irritating to eyes and skin.
R43	May cause sensitisation by skin contact.
NC	Not classified.
R68	Possible risk of irreversible effects.

Hazard Statements In Full

H319	Causes serious eye irritation.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H317	May cause an allergic skin reaction.
H341	Suspected of causing genetic defects.

SAFETY DATA SHEET
FLO-TROL

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name FLO-TROL

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Fluid loss reducer

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

Manufacturer
M-I SWACO
A Schlumberger Company
Woodlands Drive
Kirkhill Industrial Estate
Dyce, Aberdeen AB21 0GW
Scotland UK
T=+44(0)1224-246600
F=+11(0)1224-246699

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Not classified.
Environment	Not classified.

Classification (67/548/EEC) Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

Label In Accordance With (EC) No. 1272/2008

No pictogram required.

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

DERIVATIZED STARCH	60-100%
Classification (EC 1272/2008) Not classified.	Classification (67/548/EEC) Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

When heated, vapours/gases hazardous to health may be formed. Fire or high temperatures create: Carbon monoxide (CO). Carbon dioxide (CO2).

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. In case of spills, beware of slippery floors and surfaces.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments

NUI = Nuisance dust, WEL TWA 4mg/m3 Respirable Dust, 10 mg/m3 Total Dust.
No biological limit allocated.

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate general and local exhaust ventilation.

Respiratory equipment

Respiratory protection must be used if air contamination exceeds acceptable level. Dust filter P2 (for fine dust).

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Use protective gloves made of: Nitrile. or Neoprene.

Eye protection

Wear dust resistant safety goggles where there is danger of eye contact.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Powder, dust
Colour	White.
Odour	Odourless.
Solubility	Soluble in water. Forms a paste at concentrations greater than 5%.
Relative density	1.5 @ 20°C
Bulk Density	30-37lb/ft3
pH-Value, Diluted Solution	7.0 - 8.0 @ 1%
Auto Ignition Temperature (°C)	380°C/716°F

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Avoid wet and humid conditions.

10.5. Incompatible materials

Materials To Avoid

Avoid Strong oxidising substances.

10.6. Hazardous decomposition products

Fire or high temperatures create: Carbon monoxide (CO). Carbon dioxide (CO_2).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May cause discomfort if swallowed.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Particles in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com.

12.1. Toxicity

Acute Fish Toxicity

Not considered toxic to fish.

12.2. Persistence and degradability

Degradability

There are no data on the degradability of this product.

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

12.4. Mobility in soil

Mobility:

The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

General information

HMIS Health -1 HMIS Flammability - 1 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

Information Sources

Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

General revision. Compiled or Revised by Ewan MacLeod

Issued By	Bill Cameron
Revision Date	31/1/2011
Revision	4
Supersedes date	20/06/2007
SDS No.	10884

Risk Phrases In Full

NC	Not classified.

SAFETY DATA SHEET
MAGNESIUM OXIDE

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name MAGNESIUM OXIDE

REACH Registration notes This product is exempt from REACH registration according to EC Regulation 1907/2006 Article 2 § 7 b and Annex V, point 7.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses pH modifier.

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Not classified.
Environment	Not classified.

Classification (67/548/EEC) Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

Label In Accordance With (EC) No. 1272/2008

No pictogram required.

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

MAGNESIUM OXIDE		60-100%
CAS-No.: 1309-48-4	EC No.: 215-171-9	

Classification (EC 1272/2008)	Classification (67/548/EEC)
Not classified.	Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

REACH Registration notes This product is exempt from REACH registration according to EC Regulation 1907/2006 Article 2 § 7 b and Annex V, point 7.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

When heated, vapours/gases hazardous to health may be formed.

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Remove sources of ignition. Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place. Avoid contact with: Water, moisture. Interhalogens Aluminium. Magnesium. Powder. Avoid contact with acids. Oxidising materials.

Storage Class

Chemical storage.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
MAGNESIUM OXIDE	WEL		10 mg/m3			as Mg

WEL = Workplace Exposure Limit.

No biological limit allocated.

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate general and local exhaust ventilation.

Respiratory equipment

Respiratory protection must be used if air contamination exceeds acceptable level. Dust filter P2 (for fine dust).

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

Eye protection

Wear approved chemical safety goggles where eye exposure is reasonably probable.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Solid
Colour	White.
Odour	Odourless.
Solubility	Insoluble in water
Initial boiling point and boiling range (°C)	3600°C
Melting point (°C)	2802°C
Relative density	3.58 - 3.65 g/cm3
pH-Value, Conc. Solution	10.3 @ 20°C
Solubility Value (G/100G H2O@20°C)	0.006 g/l

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Avoid contact with: Interhalogens

10.4. Conditions to avoid

Avoid contact with: Water, moisture.

10.5. Incompatible materials

Materials To Avoid

Avoid contact with acids. Oxidising materials. Aluminium. Magnesium. Powder.

10.6. Hazardous decomposition products

When heated, vapours/gases hazardous to health may be formed.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

Acute Toxicity (Dermal LD50)

> 2 mg/kg Rabbit

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May cause discomfort if swallowed.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Particles in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com. OSPAR have defined this chemical as PLONOR.

12.1. Toxicity

Acute Fish Toxicity

Not considered toxic to fish.

12.2. Persistence and degradability

Degradability

Not Applicable - Inorganic chemical.

12.3. Bioaccumulative potential

Bioaccumulative potential

Not Applicable - Inorganic chemical.

12.4. Mobility in soil

Mobility:

The product is insoluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

Waste Class

The definitive European Waste code for this product will depend upon the final use that is made of this material. EWC-code: 06 03 14

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable. Please contact MISDS@slb.com for info regarding transport in Bulk.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

This product is exempt from REACH registration according to EC Regulation 1907/2006 Article 2 § 7 b and Annex V, point 7. Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

The following sections have been revised: 11

Issued By	Sandra McWilliam
Revision Date	12-09-2013
Revision	5
Supersedes date	13-06-2013
SDS No.	11193
Safety Data Sheet Status	Approved.
Date	12-09-2013
Signature	Sandra McWilliam
Signature 2	Sarah Malone

Risk Phrases In Full

NC	Not classified.

SAFETY DATA SHEET

NUOSEPT 78

Section 1. Identification

Product identifier : NUOSEPT 78

Product code : R0717024

Chemical identity : 2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol

Other means of identification : Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine

Product type : Liquid.

Material uses : Other non-specified industry: Preservative.

Supplier's details : Troy Siam Company Limited
242 Soi Chalongkrung 31,
Ladkrabang Industrial Estate
Lamplathew, Ladkrabang
Bangkok 10520 Thailand
Tel: 66-2-705-7500
Fax: 66-2-705-7599

Emergency Contact name:
Kiat Wisanrakkit - General Manager
Tel: +66-37-204-250
Hand Phone: +66-874980498

Anupop Sasook
Tel: +66-37-204-250 Ext 7640
Hand Phone: +66-968398452

Emergency telephone number (with hours of operation) : AUSTRALIA: +61 2801 44558 (24/7)

Section 2. Hazard(s) identification

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1

GHS label elements

Hazard pictograms :

Signal word : **WARNING**

Hazard statements : **Harmful if swallowed.**
Causes serious eye irritation.
May cause an allergic skin reaction.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection: Recommended: chemical splash goggles and/or face shield.. Avoid breathing vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Section 2. Hazard(s) identification

Response : IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

Section 3. Composition and ingredient information

Substance/mixture : Substance

Chemical identity : 2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol

Other means of identification : Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine

CAS number/other identifiers

CAS number : Not available.

EC number : Not available.

Product code : Not available.

Ingredient name	% (w/w)	CAS number
2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol	78	4719-04-4
2-aminoethanol	1 - 3	141-43-5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Section 4. First aid measures

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

Section 5. Fire-fighting measures

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store between the following temperatures: -5 to 30°C (23 to 86°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
2-aminoethanol	**Safe Work Australia (Australia, 8/2005).** STEL: 15 mg/m³ 15 minutes. STEL: 6 ppm 15 minutes. TWA: 7.5 mg/m³ 8 hours. TWA: 3 ppm 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Recommended: chemical splash goggles and/or face shield.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Clear. Colorless. Yellowish.

Odor : Characteristic. [Slight]

Odor threshold : Not available.

pH : 9 to 12

Melting point : Not available.

Boiling point : 110.5°C (230.9°F)

Flash point : Closed cup: Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Excessive heat >147°C (>297°F) will result in decomposition to formaldehyde.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 1.3 to 2.4 kPa (10 to 18 mm Hg) [room temperature]

Vapor density : >1 [Air = 1]

Relative density : 1.145 to 1.175

Solubility : Soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : -1.3

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Dynamic (room temperature): 60 to 100 mPa·s (60 to 100 cP)
Kinematic (room temperature): 0.6 to 1 cm^2/s (60 to 100 cSt)

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
NUOSEPT 78	LD50 Dermal LD50 Oral	Rat Rat - Female	>2000 mg/kg 1009 to 3950 mg/kg	- -

Irritation/Corrosion

Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
NUOSEPT 78	Eyes - Cornea opacity Skin - Mild irritant	Rabbit Rabbit	59 -	- -	21 days -

Sensitization

Product/ingredient name	Route of exposure	Species	Result
NUOSEPT 78	skin	Mouse	Sensitizing

Mutagenicity

Product/ingredient name	Test	Experiment	Result
NUOSEPT 78	-	Experiment: In vivo Subject: Mammalian-Animal	Negative

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
2-aminoethanol	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Section 11. Toxicological information

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
NUOSEPT 78	Acute EC50 10 to 100 mg/l Acute LC50 10 to 100 mg/l	Daphnia Fish	48 hours 96 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
2-aminoethanol	-	>90 % - Readily - 21 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
NUOSEPT 78	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
NUOSEPT 78	-1.3	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	ADG	ADR/RID	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

Australia inventory (AICS) : All components are listed or exempted.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Section 15. Regulatory information

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

International lists

National inventory

Canada	:	All components are listed or exempted.
China	:	All components are listed or exempted.
Europe	:	All components are listed or exempted.
Japan	:	**Japan inventory (ENCS)**: All components are listed or exempted. **Japan inventory (ISHL)**: Not determined.
Malaysia	:	Not determined.
New Zealand	:	All components are listed or exempted.
Philippines	:	All components are listed or exempted.
Republic of Korea	:	All components are listed or exempted.
Taiwan	:	All components are listed or exempted.
United States	:	All components are listed or exempted.

Section 16. Any other relevant information

History

Date of printing	:	4/5/2016
Date of issue/Date of revision	:	3/16/2016
Date of previous issue	:	No previous validation
Version	:	1
Key to abbreviations	:	ADG = Australian Dangerous Goods ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) NOHSC = National Occupational Health and Safety Commission SUSMP = Standard Uniform Schedule of Medicine and Poisons UN = United Nations

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H302	Expert judgment
Eye Irrit. 2A, H319	Expert judgment
Skin Sens. 1, H317	Expert judgment

References : Not available.

☑ **Indicates information that has changed from previously issued version.**

Notice to reader

Section 16. Any other relevant information

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

SAFETY DATA SHEET
POTASSIUM CHLORIDE

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name POTASSIUM CHLORIDE

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Oil well drilling fluid additive. Oil well completion fluid additive.

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

Manufacturer
M-I SWACO
A Schlumberger Company
Woodlands Drive
Kirkhill Industrial Estate
Dyce, Aberdeen AB21 0GW
Scotland UK
T=+44(0)1224-246600
F=+11(0)1224-246699

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Not classified.
Environment	Not classified.

Classification (67/548/EEC) Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

Label In Accordance With (EC) No. 1272/2008

No pictogram required.

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

POTASSIUM CHLORIDE		60-100%
CAS-No.: 7447-40-7	EC No.: 231-211-8	
Classification (EC 1272/2008) Not classified.	Classification (67/548/EEC) Not classified.	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

Fire or high temperatures create: Vapours/gases/fumes of: Chlorides.

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Provide good ventilation. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments

NUI = Nuisance dust, WEL TWA 4mg/m3 Respirable Dust, 10 mg/m3 Total Dust.

No biological limit allocated.

POTASSIUM CHLORIDE (CAS: 7447-40-7)

DNEL				
Industry	Dermal	Short Term	Systemic Effects	910 mg/kg/day
Industry	Inhalation.	Short Term	Systemic Effects	5320 mg/m3
Industry	Dermal	Long Term	Systemic Effects	303 mg/kg/day
Industry	Inhalation.	Long Term	Systemic Effects	1064 mg/m3
PNEC				
Freshwater	0.1	mg/l		
Marinewater	0.1	mg/l		
Intermittent release	1	mg/l		
STP	10	mg/l		

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust.

Respiratory equipment

If ventilation is insufficient, suitable respiratory protection must be provided. Use respiratory equipment with particle filter, type P2.

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Rubber gloves are recommended.

Eye protection

Wear dust resistant safety goggles where there is danger of eye contact.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Powder, dust
Colour	White to Pale Pink.
Odour	Odourless.
Solubility	Soluble in water.
Initial boiling point and boiling range (°C)	1406-1413°C
Melting point (°C)	768-773°C
Relative density	1.98 @ 20°C
pH-Value, Diluted Solution	~ 7 @ 1%
Solubility Value (G/100G H2O@20°C)	37
Partition Coefficient (N-Octanol/Water)	-3.0

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Avoid wet and humid conditions.

10.5. Incompatible materials

Materials To Avoid

Avoid contact with: Strong oxidising substances. Strong acids. Strong alkalis.

10.6. Hazardous decomposition products

Fire or high temperatures create: Vapours/gases/fumes of: Chlorides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

Acute Toxicity (Oral LD50)

2600 mg/kg Rat

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May cause discomfort if swallowed. Gastrointestinal symptoms, including upset stomach.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Particles in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com. OSPAR have defined this chemical as PLONOR. This is a naturally occurring mineral.

12.1. Toxicity

Acute Toxicity - Fish

LC50 96 hours 1060 mg/l Lepomis macrochirus (Bluegill)

Acute Toxicity - Aquatic Invertebrates

EC50 48 hours 825 mg/l Daphnia magna

Acute Toxicity - Aquatic Plants

EC50 72 hours 2500 mg/l

12.2. Persistence and degradability

Degradability

There are no data on the degradability of this product.

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

Partition coefficient -3.0

12.4. Mobility in soil

Mobility:

The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

Waste Class

EWC-code: 06 03 14 Waste number: 7091 Inorganic salts and other solids.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable. Please contact MISDS@slb.com for info regarding transport in Bulk.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

New Zealand Hazard Classification and HSNO Approval No.

HSR003261

Name of Group Standard and Information on Conditions of Group Standard

Information such as HSNO number and group standard have been added to fulfill the requirements for NZ regulations. As this product conforms to current EU regulations, it contains the required information to comply with the conditions of the stated group standard.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

This product is exempt from REACH registration according to EC Regulation 1907/2006 Article 2 § 7 b and Annex V, point 7. Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

General information

HMIS Health -1 HMIS Flammability - 0 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

POTASSIUM CHLORIDE

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

General revision.

Issued By	Sandra McWilliam
Revision Date	26-Feb-13
Revision	4
Supersedes date	06-Apr-11
SDS No.	10857
Safety Data Sheet Status	Approved.
Date	26-Feb-13
Signature	Sarah Malone
Signature 2	Nina Øvrehus

Risk Phrases In Full

NC	Not classified.

SAFETY DATA SHEET
SAFE-CARB (All Grades)

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

SYNONYMS, TRADE NAMES: SAFE-CARB 2, 10, 20, 25, 40, 250, 500, 1000 and 2000.

APPLICATION: Weighting agent. Lost circulation material. Bridging material.

SUPPLIER:
M-I Australia Pty Ltd
Level 11
251 Adelaide Terrace
Perth
WA 6000
T = 08 9440 2900

MANUFACTURER:
M-I SWACO
A Schlumberger Company
Endeavour Drive
Arnhall Business Park, Westhill
Aberdeen AB32 6UF
Scotland UK
T = +44 (0)1224-742200
F = +44 (0)1224-742288
E-mail = MBXMSDS-EH@miswaco.slb.com

EMERGENCY TELEPHONE: (24 Hour) Europe +44 (0) 1235 239 670, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Middle East and Africa +44 (0) 1235 239 671, Australia +61 2801 44558.

2 HAZARDS IDENTIFICATION

CLASSIFICATION (1999/45): Not classified.

CLASSIFICATION (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Not classified.
Environment	Not classified.

LABEL IN ACCORDANCE WITH (EC) NO. 1272/2008

Not classified.

HUMAN HEALTH

This product contains a small quantity of quartz, crystalline silica. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or crystobalite from occupational sources causes cancer in humans. IARC classification Group 1. Because of quantity and composition, the health hazard is small.

3 COMPOSITION/INFORMATION ON INGREDIENTS

CALCIUM CARBONATE		60-100%
CAS-No.: 471-34-1	EC No.: 207-439-9	
Classification (EC 1272/2008) Not classified.	Classification (67/548/EEC) Not classified.	

QUARTZ, CRYSTALLINE SILICA		<1%
CAS-No.: 14808-60-7	EC No.: 238-878-4	
Classification (EC 1272/2008) STOT Rep. 2 - H373	Classification (67/548/EEC) Xn;R48/20.	

The Full Text for all R-Phrases and Hazard Statements is Displayed in Section 16

COMPOSITION COMMENTS

The data shown is in accordance with the latest EC Directives. This product contains a small quantity of quartz, crystalline silica. Prolonged and repeated exposure to concentrations of crystalline silica exceeding the workplace exposure limit (WEL) may lead to chronic lung disease such as silicosis. Because of quantity and composition, the health hazard is small.

4 FIRST-AID MEASURES

INHALATION

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

INGESTION

Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

SKIN CONTACT

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

EYE CONTACT

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Use fire-extinguishing media appropriate for surrounding materials.

SPECIAL FIRE FIGHTING PROCEDURES

Containers close to fire should be removed immediately or cooled with water.

UNUSUAL FIRE & EXPLOSION HAZARDS

High concentrations of dust may form explosive mixture with air.

SPECIFIC HAZARDS

During fire, toxic gases (CO, CO2) are formed.

PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear protective clothing as described in Section 8 of this safety data sheet.

ENVIRONMENTAL PRECAUTIONS

Do not allow to enter drains, sewers or watercourses.

SPILL CLEAN UP METHODS

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation.

STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
QUARTZ, CRYSTALLINE SILICA	WEL		0,1 mg/m3			

WEL = Workplace Exposure Limit.

PROTECTIVE EQUIPMENT

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. Dust filter P3 (for especially fine dust/powder).

HAND PROTECTION

For prolonged or repeated skin contact use suitable protective gloves. Use protective gloves made of: Nitrile. or Neoprene.

EYE PROTECTION

Wear approved chemical safety goggles where eye exposure is reasonably probable.

OTHER PROTECTION

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Powder, dust
COLOUR	White / off-white
ODOUR	Odourless
SOLUBILITY	Insoluble in water
RELATIVE DENSITY	2.7 - 2.9
pH-VALUE, DILUTED SOLUTION	8.5 - 9.5 @ 100g/l
DECOMPOSITION TEMPERATURE (°C)	825°C

10 STABILITY AND REACTIVITY

STABILITY

Stable under normal temperature conditions and recommended use.

11 TOXICOLOGICAL INFORMATION

INHALATION

Dust in high concentrations may irritate the respiratory system.

INGESTION

May cause discomfort if swallowed.

SKIN CONTACT

Prolonged and frequent contact may cause redness and irritation.

EYE CONTACT

Particles in the eyes may cause irritation and smarting.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Contact M-I SWACO's QHSE Department for ecological information at env@miswaco.com.

WATER HAZARD CLASSIFICATION

Not hazardous to Water.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

14 TRANSPORT INFORMATION

GENERAL	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

15 REGULATORY INFORMATION

UK REGULATORY REFERENCES

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU DIRECTIVES

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

INTERNATIONAL CHEMICAL INVENTORIES

Contact REACH@miswaco.com for REACH information. Complies with the following national/regional chemical inventory requirements: AICS, DSL / NDSL, IECSC, EINECS / ELINCS, METI ENCS, TCCL ECL, NZIoC, PICCS, TSCA,

16 OTHER INFORMATION

SAFE-CARB (All Grades)

INFORMATION SOURCES

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

REVISION COMMENTS

Updated according to CLP. Compiled or Revised by Ewan MacLeod

ISSUED BY

Bill Cameron

REVISION DATE	11/01/2011
REV. NO./REPL. SDS GENERATED	6
SDS NO.	11713

RISK PHRASES IN FULL

NC	Not classified.
R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.

HAZARD STATEMENTS IN FULL

H373	May cause damage to organs <<Organs>> through prolonged or repeated exposure.

Safety Data Sheet
SAFE-SCAV† CA

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name SAFE-SCAV† CA
Product code MI12267AUZ

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended use Oxygen Scavenger.

Uses advised against None known.

1.3 Details of the supplier of the safety data sheet

Supplier identification
M-I Australia Pty Ltd
Level 5
256 St. George Terrace
Perth
WA 6000
T= 08 9440 2900
MISDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label Elements

Signal word
None

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Indication of danger
Not classified

Contains

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature
Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances

Component	EC-No.	CAS-No	Weight % - range	Classification (67/548)	Classification (Reg. 1272/2008)	REACH registration number
	Listed	Proprietary	60-100	-	Not classified	01-2120009701-69-xxxx

3.2 Mixtures

Not Applicable

Comments
No classified ingredients, or those having occupational exposure limits, present above the level of disclosure.

4. First aid measures

4.1 Description of first-aid measures

Inhalation — If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion — Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Skin contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Fog, Alcohol Foam, CO_2, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Precautions against fire and explosion
Dust may form explosive mixture in air.

Hazardous combustion products
Fire or high temperatures create:, Carbon oxides (COx).

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

If spilled, take caution, as material can cause surfaces to become very slippery. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures
Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands before eating, drinking or smoking. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions	Ensure adequate ventilation. Keep airborne concentrations below exposure limits. Take precautionary measures against static discharges.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid contact with: Heat, flames and sparks Strong oxidising agents Strong bases Metals
Storage class	Chemical storage.
Packaging material	Use specially constructed containers only

7.3 Specific end uses

See also Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits The product does not contain any hazardous materials with occupational exposure limits established. No biological limit allocated

Component	EU OEL - Third List	Austria	Australia	Denmark
	Not determined	Not determined	Not determined	Not determined

Component	Finland	France	Germany	Hungary
	Not determined	Not determined	Not determined	Not determined

Component	New Zealand	Italy	Netherlands	Norway
	Not Determined	Not determined	Not determined	Not determined

Component	Poland	Portugal	Romania	Russia
	Not determined	Not determined	Not determined	Not determined

Component	Spain	Switzerland	Turkey	UK
	Not determined	Not determined	Not determined	Not determined

Dermal	3 mg/kg
Inhalation	10.57 mg/m³
Fresh Water	0.1 mg/l
Sea Water	0.01 mg/l
Fresh water sediment	0.362 mg/kg
Sea sediment	0.0362 mg/kg
Soil	0.0137 mg/kg
Impact on Sewage Treatment	4 mg/l
Intermittent release	1 mg/l

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection	It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.
Hand protection	Repeated or prolonged contact:, Use protective gloves made of:, Nitrile, Butyl.
Respiratory protection	No personal respiratory protective equipment normally required, In case of insufficient ventilation wear suitable respiratory equipment, Half mask with a particle filter P2 (BS EN 143).
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.

Hygiene measures Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid
Appearance	Powder
Odour	Odourless
Colour	White
Odor threshold	Not applicable

Property	**Values**	**Remarks**
pH	No information available	
pH @ dilution	7.5	@ 10%
Melting/freezing point		
Boiling point/range	No information available	
Flash Point	No information available	
Evaporation rate		
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability Limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	No information available	

Bulk density	No information available	
Relative density	1.65	@ 20°C.
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity		
Viscosity, dynamic	No information available	
Log Pow	Not determined	

Explosive properties	Not Applicable
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density VALUE	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerisation does not occur.

10.4 Conditions to avoid

Avoid contact with heat, sparks, open flame, and static discharge.

10.5 Incompatible materials

Metals. Strong bases. Strong oxidising agents.

10.6 Hazardous decomposition products

See also section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation	Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact May cause slight irritation.

Skin contact Prolonged contact may cause redness and irritation.

Ingestion Ingestion may cause stomach discomfort.

Acute toxicity .

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
	> 5 g/kg (Rat)	No data available	No data available

Sensitisation This product does not contain any components suspected to be sensitizing.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity This product does not contain any known or suspected carcinogens.

Reproductive toxicity None known.

Routes of exposure None known.

Routes of entry No route of entry noted.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard No hazard from product as supplied.

12. Ecological information

12.1 Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
This product is not considered toxic to algae.

Toxicity to fish
This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
	No information available	No information available	No information available

12.2 Persistence and degradability

Not readily biodegradable.

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

Mobility
Soluble in water.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWC waste disposal No.	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWC waste disposal No: 07 01 99.

14. Transport information

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA,ADR/RID/ADG).

14.1 UN number
Not regulated

14.2 Proper shipping name
Not regulated

14.3. Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated

14.5 Environmental hazard
No

14.6 Special precautions
Not Applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Please contact MISDS@slb.com for info regarding transport in Bulk.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Australian Standard for the Uniform Scheduling of Drugs and Poisons
No Poisons Schedule number allocated

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)].

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition].

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)].

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

International inventories

USA, Toxic Substances Control Act inventory (TSCA)	Complies
European Union - EINECS and ELINCS	Complies
Canada, Domestic Substance List (DSL)	Complies
Philippines (PICCS)	Complies
Inventory - Japan - Existing and New Chemicals list	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korea (KECL)	Complies
Inventory - New Zealand - Inventory of Chemicals (NZIoC)	Complies

Contact REACH@miswaco.slb.com for REACH information.

15.2 Chemical Safety Report

No information available

16. Other information

Prepared by	Global Chemical Regulatory Compliance (GCRC) , Anne Karin (Anka) Fosse
Supercedes date	19/May/2011
Revision date	08/Oct/2014
Version	7
The following sections have been revised	This SDS have been made in a new database and therefore a new layout. No changes with regard to classification have been made, Updated according to GHS/CLP.

Full text of H-Statements referred to under sections 2 and 3

†A mark of M-I L.L.C.

Disclaimer
The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Signal word
DANGER

Hazard statements
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage

Precautionary Statements - EU (§28, 1272/2008)
P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention

Supplementary precautionary statements
P264 - Wash face, hands and any exposed skin thoroughly after handling
P272 - Contaminated work clothing should not be allowed out of the workplace
P362 - Take off contaminated clothing and wash before reuse
P501 - Dispose of contents/container in accordance with local regulations.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Indication of danger
Xi - Irritant

R-code(s)
R38, R41, R43

Contains
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature
Classified as Hazardous according to the criteria of NOHSC.
HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	EC-No.	CAS-No	Weight % - range	Classification (67/548)	Classification (Reg. 1272/2008)	REACH registration number
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	272-712-1	68909-77-3	30-60	Xi; R38, R41, R43	Skin Irrit.2(H315) Skin Sens. 1B(H317) Eye Dam. 1(H318)	01-2119537286-35-xxxx

Comments
The product contains other ingredients which do not contribute to the overall classification.

4. First aid measures

4.1 First-Aid Measures

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.

Skin contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation persists.

Eye contact Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Seek medical attention at once.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO_2, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
None known.

Hazardous combustion products
Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up
Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Avoid spills and splashing during use. Persons susceptible to allergic reactions should not handle this product.

Hygiene measures
Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands before eating, drinking or smoking Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid: Acids Nitrites
Store at room temperature.

Storage class Chemical storage.

Packaging material Use specially constructed containers only.

7.3 Specific end uses

See Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits Contains no substances with occupational exposure limit values
No biological limit allocated

Component	EU OEL	Austria	Australia	Denmark
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	Not determined	Not determined	Not determined	Not determined

Component	Malaysia	France	Germany	Hungary
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	Not determined	Not determined	Not determined	Not determined

Component	New Zealand	Italy	Netherlands	Norway
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	Not Determined	Not determined	Not determined	Not determined

Component	Poland	Portugal	Romania	Russia
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	Not determined	Not determined	Not determined	Not determined

Component	Spain	Switzerland	Turkey	UK
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	Not determined	Not determined	Not determined	Not determined

Derived No Effect Level (DNEL)

Short term exposure systemic effects

Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues

Dermal	12.5 mg/kg
Inhalation	29.4 mg/m³

Long term exposure systemic effects

Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues

Dermal	12.5 mg/kg
Inhalation	29.4 mg/m³

Predicted No Effect Concentration (PNEC)

Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues

Fresh water	0.12 mg/L
Sea water	0.012 mg/L
Fresh water sediment	0.636 mg/kg
Sea sediment	0.0636 mg/kg
Soil	0.0566 mg/kg
Impact on sewage treatment	1000 mg/L
Intermittent release	12 mg/L

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Local exhaust ventilation.

Personal protective equipment

Eye protection	It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.
Hand protection	Use protective gloves made of:, Rubber, Neoprene, PVC, Be aware that liquid may penetrate the gloves. Frequent change is advisable.
Respiratory protection	No personal respiratory protective equipment normally required, In case of insufficient ventilation wear suitable respiratory equipment, Use respirator with organic vapor protection (A, brown), At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
Hygiene measures	Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Odor	Slight
Color	Dark Amber
Odor threshold	Not applicable

Property	Values	Remarks
pH	Approximately 11.5	
pH @ dilution		
Melting/freezing point	No information available	
Boiling point/range	> 100 °C	
Flash point	> 100 °C	Closed cup
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	1.03 - 1.05	@ 20 °C
Bulk density	No information available	
Relative density	No information available	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	No information available	

Explosive properties	Not Applicable
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid

Store at room temperature.

10.5 Incompatible materials

Acids. Do not add nitrites or other nitrosating agents to this product. May cause formation of nitrosamine.

10.6 Hazardous decomposition products

See also section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation Inhalation of vapors in high concentration may cause irritation of respiratory system.

Eye contact Causes serious eye damage.

Skin contact Causes skin irritation. May cause an allergic skin reaction.

Ingestion Ingestion may cause stomach discomfort.

Unknown acute toxicity Not Applicable.

LD50 Oral 5000 mg/kg (based on components)
LD50 Dermal > 2000 mg/kg (based on components)

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethanol, 2,2''-oxybis-, reaction products with ammonia, morpholine derivs. residues	= 1500 mg/kg (Rat)	No data available	No data available

Sensitization May cause sensitization by skin contact.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity This product does not contain any known or suspected carcinogens.

Reproductive toxicity This product does not contain any known or suspected reproductive hazards.

Routes of exposure Skin contact. Eye contact.

Routes of entry None known.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard No hazard from product as supplied.

12. Ecological information

12.1 Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
EC50 72h : > 100 mg/l.

Toxicity to fish
LC50 96h : > 100 mg/l.

Toxicity to daphnia and other aquatic invertebrates
EC50 48h : > 100 mg/l.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Ethanol, 2,2"-oxybis-, reaction products with ammonia, morpholine derivs. residues	No information available	No information available	No information available

12.2 Persistence and degradability

Product is biodegradable.

12.3 Bioaccumulative potential

No bioaccumulation expected due to high molecular weight.

12.4 Mobility in soil

Mobility
The product is water soluble, and may spread in water systems.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused Dispose of in accordance with local regulations.

products

Contaminated packaging	Empty containers should be taken for local recycling, recovery or waste disposal.
EWC Waste disposal No.	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWC waste disposal No: 07 01 01

14. Transport information

14.1 UN Number
Not regulated

14.2 Proper shipping name
The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated

14.4 Packing group

ADR/RID/ADN/ADG Packing group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated

14.5 Environmental hazard
No

14.6 Special precautions
Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Please contact MISDS@slb.com for info regarding transport in Bulk.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Germany, Water Endangering Classes (VwVwS)	Water endangering class = 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons
No Poisons Schedule number allocated

New Zealand hazard classification	Irritant
HSNO approval no.	HSR003599
Group number	6.4A, 9.1C

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European

Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)].

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition].

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)].

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

ADG Code – Australian Dangerous Goods Code.

International inventories

USA (TSCA)	Complies
European Union (EINECS and ELINCS)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Does not Comply
Japan (ENCS)	Does not Comply
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Does not Comply
New Zealand (NZIoC)	Complies

Contact REACH@miswaco.slb.com for REACH information.

15.2 Chemical Safety Report

No information available

16. Other information

Prepared by	Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Anne Karin (Anka) Fosse
Supersedes date	31-Jan-2012
Revision date	10-Mar-2015
Version	10
The following sections have been revised:	Updated according to GHS/CLP, This SDS has been made in a new database and therefore a new layout. There have been changes with regard to classification.

Text of R phrases mentioned in Section 3
R38 - Irritating to skin

R41 - Risk of serious damage to eyes
R43 - May cause sensitization by skin contact

Full text of H-Statements referred to under sections 2 and 3

H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage

*A mark of M-I L.L.C., a Schlumberger Company

Disclaimer
The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

SAFETY DATA SHEET

NUOSEPT 78

Section 1. Identification

Product identifier : NUOSEPT 78

Product code : R0717024

Chemical identity : 2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol

Other means of identification : Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine

Product type : Liquid.

Material uses : Other non-specified industry: Preservative.

Supplier's details : Troy Siam Company Limited
242 Soi Chalongkrung 31,
Ladkrabang Industrial Estate
Lamplathew, Ladkrabang
Bangkok 10520 Thailand
Tel: 66-2-705-7500
Fax: 66-2-705-7599

Emergency Contact name:
Kiat Wisanrakkit - General Manager
Tel: +66-37-204-250
Hand Phone: +66-874980498

Anupop Sasook
Tel: +66-37-204-250 Ext 7640
Hand Phone: +66-968398452

Emergency telephone number (with hours of operation) : AUSTRALIA: +61 2801 44558 (24/7)

Section 2. Hazard(s) identification

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1

GHS label elements

Hazard pictograms :

Signal word : **WARNING**

Hazard statements : **Harmful if swallowed.**
Causes serious eye irritation.
May cause an allergic skin reaction.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection: Recommended: chemical splash goggles and/or face shield.. Avoid breathing vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Section 2. Hazard(s) identification

Response : IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

Section 3. Composition and ingredient information

Substance/mixture : Substance

Chemical identity : 2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol

Other means of identification : Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine

CAS number/other identifiers

CAS number : Not available.

EC number : Not available.

Product code : Not available.

Ingredient name	% (w/w)	CAS number
2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol	78	4719-04-4
2-aminoethanol	1 - 3	141-43-5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Section 4. First aid measures

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

Section 5. Fire-fighting measures

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store between the following temperatures: -5 to 30°C (23 to 86°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
2-aminoethanol	**Safe Work Australia (Australia, 8/2005).** STEL: 15 mg/m³ 15 minutes. STEL: 6 ppm 15 minutes. TWA: 7.5 mg/m³ 8 hours. TWA: 3 ppm 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Recommended: chemical splash goggles and/or face shield.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Clear. Colorless. Yellowish.

Odor : Characteristic. [Slight]

Odor threshold : Not available.

pH : 9 to 12

Melting point : Not available.

Boiling point : 110.5°C (230.9°F)

Flash point : Closed cup: Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Excessive heat >147°C (>297°F) will result in decomposition to formaldehyde.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 1.3 to 2.4 kPa (10 to 18 mm Hg) [room temperature]

Vapor density : >1 [Air = 1]

Relative density : 1.145 to 1.175

Solubility : Soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : -1.3

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Dynamic (room temperature): 60 to 100 mPa·s (60 to 100 cP)
Kinematic (room temperature): 0.6 to 1 cm^2/s (60 to 100 cSt)

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
NUOSEPT 78	LD50 Dermal LD50 Oral	Rat Rat - Female	>2000 mg/kg 1009 to 3950 mg/kg	- -

Irritation/Corrosion

Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
NUOSEPT 78	Eyes - Cornea opacity Skin - Mild irritant	Rabbit Rabbit	59 -	- -	21 days -

Sensitization

Product/ingredient name	Route of exposure	Species	Result
NUOSEPT 78	skin	Mouse	Sensitizing

Mutagenicity

Product/ingredient name	Test	Experiment	Result
NUOSEPT 78	-	Experiment: In vivo Subject: Mammalian-Animal	Negative

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
2-aminoethanol	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Section 11. Toxicological information

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
NUOSEPT 78	Acute EC50 10 to 100 mg/l Acute LC50 10 to 100 mg/l	Daphnia Fish	48 hours 96 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
2-aminoethanol	-	>90 % - Readily - 21 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
NUOSEPT 78	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
NUOSEPT 78	-1.3	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	ADG	ADR/RID	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

Australia inventory (AICS) : All components are listed or exempted.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Section 15. Regulatory information

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

International lists

National inventory

Canada	:	All components are listed or exempted.
China	:	All components are listed or exempted.
Europe	:	All components are listed or exempted.
Japan	:	**Japan inventory (ENCS)**: All components are listed or exempted. **Japan inventory (ISHL)**: Not determined.
Malaysia	:	Not determined.
New Zealand	:	All components are listed or exempted.
Philippines	:	All components are listed or exempted.
Republic of Korea	:	All components are listed or exempted.
Taiwan	:	All components are listed or exempted.
United States	:	All components are listed or exempted.

Section 16. Any other relevant information

History

Date of printing	:	4/5/2016
Date of issue/Date of revision	:	3/16/2016
Date of previous issue	:	No previous validation
Version	:	1
Key to abbreviations	:	ADG = Australian Dangerous Goods ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) NOHSC = National Occupational Health and Safety Commission SUSMP = Standard Uniform Schedule of Medicine and Poisons UN = United Nations

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H302	Expert judgment
Eye Irrit. 2A, H319	Expert judgment
Skin Sens. 1, H317	Expert judgment

References : Not available.

☑ **Indicates information that has changed from previously issued version.**

Notice to reader

Section 16. Any other relevant information

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

SAFETY DATA SHEET
POTASSIUM CHLORIDE

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name POTASSIUM CHLORIDE

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Oil well drilling fluid additive. Oil well completion fluid additive.

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

Manufacturer
M-I SWACO
A Schlumberger Company
Woodlands Drive
Kirkhill Industrial Estate
Dyce, Aberdeen AB21 0GW
Scotland UK
T=+44(0)1224-246600
F=+11(0)1224-246699

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Not classified.
Environment	Not classified.

Classification (67/548/EEC) Not classified.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

Label In Accordance With (EC) No. 1272/2008

No pictogram required.

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

POTASSIUM CHLORIDE		60-100%
CAS-No.: 7447-40-7	EC No.: 231-211-8	
Classification (EC 1272/2008) Not classified.	Classification (67/548/EEC) Not classified.	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

Fire or high temperatures create: Vapours/gases/fumes of: Chlorides.

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Provide good ventilation. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments

NUI = Nuisance dust, WEL TWA 4mg/m3 Respirable Dust, 10 mg/m3 Total Dust.

No biological limit allocated.

POTASSIUM CHLORIDE (CAS: 7447-40-7)

DNEL				
Industry	Dermal	Short Term	Systemic Effects	910 mg/kg/day
Industry	Inhalation.	Short Term	Systemic Effects	5320 mg/m3
Industry	Dermal	Long Term	Systemic Effects	303 mg/kg/day
Industry	Inhalation.	Long Term	Systemic Effects	1064 mg/m3
PNEC				
Freshwater	0.1	mg/l		
Marinewater	0.1	mg/l		
Intermittent release	1	mg/l		
STP	10	mg/l		

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust.

Respiratory equipment

If ventilation is insufficient, suitable respiratory protection must be provided. Use respiratory equipment with particle filter, type P2.

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Rubber gloves are recommended.

Eye protection

Wear dust resistant safety goggles where there is danger of eye contact.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Powder, dust
Colour	White to Pale Pink.
Odour	Odourless.
Solubility	Soluble in water.
Initial boiling point and boiling range (°C)	1406-1413°C
Melting point (°C)	768-773°C
Relative density	1.98 @ 20°C
pH-Value, Diluted Solution	~ 7 @ 1%
Solubility Value (G/100G H2O@20°C)	37
Partition Coefficient (N-Octanol/Water)	-3.0

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Avoid wet and humid conditions.

10.5. Incompatible materials

Materials To Avoid

Avoid contact with: Strong oxidising substances. Strong acids. Strong alkalis.

10.6. Hazardous decomposition products

Fire or high temperatures create: Vapours/gases/fumes of: Chlorides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

Acute Toxicity (Oral LD50)

2600 mg/kg Rat

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May cause discomfort if swallowed. Gastrointestinal symptoms, including upset stomach.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Particles in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com. OSPAR have defined this chemical as PLONOR. This is a naturally occurring mineral.

12.1. Toxicity

Acute Toxicity - Fish

LC50 96 hours 1060 mg/l Lepomis macrochirus (Bluegill)

Acute Toxicity - Aquatic Invertebrates

EC50 48 hours 825 mg/l Daphnia magna

Acute Toxicity - Aquatic Plants

EC50 72 hours 2500 mg/l

12.2. Persistence and degradability

Degradability

There are no data on the degradability of this product.

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

Partition coefficient -3.0

12.4. Mobility in soil

Mobility:

The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

Waste Class

EWC-code: 06 03 14 Waste number: 7091 Inorganic salts and other solids.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable. Please contact MISDS@slb.com for info regarding transport in Bulk.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

New Zealand Hazard Classification and HSNO Approval No.

HSR003261

Name of Group Standard and Information on Conditions of Group Standard

Information such as HSNO number and group standard have been added to fulfill the requirements for NZ regulations. As this product conforms to current EU regulations, it contains the required information to comply with the conditions of the stated group standard.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

This product is exempt from REACH registration according to EC Regulation 1907/2006 Article 2 § 7 b and Annex V, point 7. Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

General information

HMIS Health -1 HMIS Flammability - 0 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

POTASSIUM CHLORIDE

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

General revision.

Issued By	Sandra McWilliam
Revision Date	26-Feb-13
Revision	4
Supersedes date	06-Apr-11
SDS No.	10857
Safety Data Sheet Status	Approved.
Date	26-Feb-13
Signature	Sarah Malone
Signature 2	Nina Øvrehus

Risk Phrases In Full

NC	Not classified.

SAFETY DATA SHEET
SAFE-LUBE*

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name SAFE-LUBE*

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Lubricant.

1.3. Details of the supplier of the safety data sheet

Supplier M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (1999/45/EEC) Not classified.

2.2. Label elements

Risk Phrases

NC Not classified.

Safety Phrases

NC Not classified.

Australian statement of hazardous/dangerous nature

Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Composition Comments

The data shown is in accordance with the latest EC Directives. No classified ingredients, or those having occupational exposure limits, present above the levels of disclosure.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Do not induce vomiting. Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Specific hazards

Fire or high temperatures create: Vapours/gases/fumes of: Carbon monoxide (CO). Carbon dioxide (CO2). Oxides of: Potassium.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Stop leak if possible without risk. Dike far ahead of larger spills for later disposal. Absorb spillage with suitable absorbent material. Shovel into dry containers. Cover and move the containers. Flush the area with water. In case of spills, beware of slippery floors and surfaces.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid spilling, skin and eye contact. Avoid inhalation of vapours and spray mists. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product. Keep away from heat, sparks and open flame. Avoid contact with oxidisers or reducing agents.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.

Storage Class

Chemical storage.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments

No exposure limits noted for ingredient(s).
No biological limit allocated.

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate general and local exhaust ventilation.

Respiratory equipment

No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. Chemical respirator with organic vapour cartridge.

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Neoprene. or Nitrile gloves are recommended.

Eye protection

Wear approved chemical safety goggles where eye exposure is reasonably probable.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Liquid
Colour	Clear Amber
Odour	Characteristic.
Solubility	Dispersible in water.
Initial boiling point and boiling range (°C)	>93.3°C (200°F)
pH-Value, Diluted Solution	6.5 - 7.0 @ 10%
Flash point (°C)	> 200°F PM Closed cup.

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Keep away from heat, sparks and open flame.

10.5. Incompatible materials

Materials To Avoid

Avoid contact with oxidisers or reducing agents.

10.6. Hazardous decomposition products

Fire or high temperatures create: Vapours/gases/fumes of: Carbon monoxide (CO). Carbon dioxide (CO2). Oxides of: Potassium.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Gas or vapour in high concentrations may irritate respiratory system.

Ingestion

May cause discomfort if swallowed.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Spray and vapour in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com.

12.1. Toxicity

Acute Fish Toxicity

The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

12.2. Persistence and degradability

Degradability

The product is not readily biodegradable.

Biodegradation 44.4 %

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

12.4. Mobility in soil

Mobility:

Dispersible in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

Waste Class

The definitive European Waste code for this product will depend upon the final use that is made of this material. EWC-code: 06 02 99
Waste number: 7097. Inorganic solutions and liquids.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable. Please contact MISDS@slb.com for info regarding transport in Bulk.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

National Regulations

In accordance with Dutch Mining Regulation 9.2 and ARBO regulation Chapter 4.

Water hazard classification

WGK 2

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms used in the safety data sheet

*a mark of M-I L.L.C.

General information

HMIS Health -1 HMIS Flammability - 1 HMIS Physical Hazard - 0 J - Splash Goggles, Gloves, Synthetic Apron, Dust and Vapour Respirator.

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

Updated according to REACH Annex II.

Issued By	Sandra McWilliam
Revision Date	03-07-2013
Revision	4
Supersedes date	03-03-2010
SDS No.	10766
Safety Data Sheet Status	Approved.
	03-07-2013
Signature	Sandra McWilliam
Signature 2	Sarah Malone

Risk Phrases In Full

NC	Not classified.

Safety Data Sheet
SAFE-SCAV† CA

1. Identification of the substance/preparation and of the Company/undertaking

1.1 Product identifier

Product name SAFE-SCAV† CA
Product code MI12267AUZ

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended use Oxygen Scavenger.

Uses advised against None known.

1.3 Details of the supplier of the safety data sheet

Supplier identification
M-I Australia Pty Ltd
Level 5
256 St. George Terrace
Perth
WA 6000
T= 08 9440 2900
MISDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone - (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Health hazards Not classified

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label Elements

Signal word
None

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Indication of danger
Not classified

Contains

For the full text of the R-phrases and H-Statements mentioned in this Section, see Section 16.

2.3 Other data

Not classified as PBT/vPvB by current EU criteria

Australian statement of hazardous/dangerous nature
Classified as Non-Hazardous according to the criteria of NOHSC.
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

3.1 Substances

Component	EC-No.	CAS-No	Weight % - range	Classification (67/548)	Classification (Reg. 1272/2008)	REACH registration number
	Listed	Proprietary	60-100	-	Not classified	01-2120009701-69-xxxx

3.2 Mixtures

Not Applicable

Comments
No classified ingredients, or those having occupational exposure limits, present above the level of disclosure.

4. First aid measures

4.1 Description of first-aid measures

Inhalation — If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion — Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Skin contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Fog, Alcohol Foam, CO_2, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Precautions against fire and explosion
Dust may form explosive mixture in air.

Hazardous combustion products
Fire or high temperatures create:, Carbon oxides (COx).

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

If spilled, take caution, as material can cause surfaces to become very slippery. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation. If spilled, take caution, as material can cause surfaces to become very slippery.

Hygiene measures
Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands before eating, drinking or smoking. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions	Ensure adequate ventilation. Keep airborne concentrations below exposure limits. Take precautionary measures against static discharges.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid contact with: Heat, flames and sparks Strong oxidising agents Strong bases Metals
Storage class	Chemical storage.
Packaging material	Use specially constructed containers only

7.3 Specific end uses

See also Section 1.2.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits The product does not contain any hazardous materials with occupational exposure limits established. No biological limit allocated

Component	EU OEL - Third List	Austria	Australia	Denmark
	Not determined	Not determined	Not determined	Not determined

Component	Finland	France	Germany	Hungary
	Not determined	Not determined	Not determined	Not determined

Component	New Zealand	Italy	Netherlands	Norway
	Not Determined	Not determined	Not determined	Not determined

Component	Poland	Portugal	Romania	Russia
	Not determined	Not determined	Not determined	Not determined

Component	Spain	Switzerland	Turkey	UK
	Not determined	Not determined	Not determined	Not determined

Dermal	3 mg/kg
Inhalation	10.57 mg/m³
Fresh Water	0.1 mg/l
Sea Water	0.01 mg/l
Fresh water sediment	0.362 mg/kg
Sea sediment	0.0362 mg/kg
Soil	0.0137 mg/kg
Impact on Sewage Treatment	4 mg/l
Intermittent release	1 mg/l

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection	It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.
Hand protection	Repeated or prolonged contact:, Use protective gloves made of:, Nitrile, Butyl.
Respiratory protection	No personal respiratory protective equipment normally required, In case of insufficient ventilation wear suitable respiratory equipment, Half mask with a particle filter P2 (BS EN 143).
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.

Hygiene measures Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid
Appearance	Powder
Odour	Odourless
Colour	White
Odor threshold	Not applicable

Property	**Values**	**Remarks**
pH	No information available	
pH @ dilution	7.5	@ 10%
Melting/freezing point		
Boiling point/range	No information available	
Flash Point	No information available	
Evaporation rate		
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability Limit	Not applicable	
Lower flammability limit	Not applicable	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	No information available	

Bulk density	No information available	
Relative density	1.65	@ 20°C.
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity		
Viscosity, dynamic	No information available	
Log Pow	Not determined	

Explosive properties	Not Applicable
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density VALUE	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerisation does not occur.

10.4 Conditions to avoid

Avoid contact with heat, sparks, open flame, and static discharge.

10.5 Incompatible materials

Metals. Strong bases. Strong oxidising agents.

10.6 Hazardous decomposition products

See also section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation	Inhalation of dust in high concentration may cause irritation of respiratory system.

Eye contact May cause slight irritation.

Skin contact Prolonged contact may cause redness and irritation.

Ingestion Ingestion may cause stomach discomfort.

Acute toxicity .

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
	> 5 g/kg (Rat)	No data available	No data available

Sensitisation This product does not contain any components suspected to be sensitizing.

Mutagenic effects This product does not contain any known or suspected mutagens.

Carcinogenicity This product does not contain any known or suspected carcinogens.

Reproductive toxicity None known.

Routes of exposure None known.

Routes of entry No route of entry noted.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (repeated exposure) Not classified.

Aspiration hazard No hazard from product as supplied.

12. Ecological information

12.1 Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae
This product is not considered toxic to algae.

Toxicity to fish
This product is not considered toxic to fish.

Toxicity to daphnia and other aquatic invertebrates
This product is not considered toxic to invertebrates.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
	No information available	No information available	No information available

12.2 Persistence and degradability

Not readily biodegradable.

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

Mobility
Soluble in water.

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be transported/delivered using a registered waste carrier for local recycling or waste disposal.

EWC waste disposal No.	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. The following Waste Codes are only suggestions: EWC waste disposal No: 07 01 99.

14. Transport information

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA,ADR/RID/ADG).

14.1 UN number
Not regulated

14.2 Proper shipping name
Not regulated

14.3. Hazard class(es)

ADR/RID/ADN Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated

14.5 Environmental hazard
No

14.6 Special precautions
Not Applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Please contact MISDS@slb.com for info regarding transport in Bulk.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Australian Standard for the Uniform Scheduling of Drugs and Poisons
No Poisons Schedule number allocated

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

This safety data sheet complies with the requirements of Regulation (EC) No. 1272/2008.

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)].

National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition].

National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)].

Safe Work Australia.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.

International inventories

USA, Toxic Substances Control Act inventory (TSCA)	Complies
European Union - EINECS and ELINCS	Complies
Canada, Domestic Substance List (DSL)	Complies
Philippines (PICCS)	Complies
Inventory - Japan - Existing and New Chemicals list	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korea (KECL)	Complies
Inventory - New Zealand - Inventory of Chemicals (NZIoC)	Complies

Contact REACH@miswaco.slb.com for REACH information.

15.2 Chemical Safety Report

No information available

16. Other information

Prepared by	Global Chemical Regulatory Compliance (GCRC) , Anne Karin (Anka) Fosse
Supercedes date	19/May/2011
Revision date	08/Oct/2014
Version	7
The following sections have been revised	This SDS have been made in a new database and therefore a new layout. No changes with regard to classification have been made, Updated according to GHS/CLP.

Full text of H-Statements referred to under sections 2 and 3

†A mark of M-I L.L.C.

Disclaimer
The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET
SODA ASH

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name SODA ASH

Synonyms, Trade Names SODIUM CARBONATE

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses pH modifier.

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 5
256 St. George Tce
Perth
WA 6000
T = 08 9440 2900

Contact Person MISDS@slb.com

Manufacturer
M-I SWACO
A Schlumberger Company
Woodlands Drive
Kirkhill Industrial Estate
Dyce, Aberdeen AB21 0GW
Scotland UK
T=+44(0)1224-246600
F=+11(0)1224-246699

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Eye Irrit. 2 - H319
Environment	Not classified.

Classification (1999/45/EEC) Xi;R36.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

Contains SODIUM CARBONATE

Label In Accordance With (EC) No. 1272/2008

Signal Word Warning

Hazard Statements

H319	Causes serious eye irritation.

Precautionary Statements

P305+351+338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+313	If eye irritation persists: Get medical advice/attention.

Supplementary Precautionary Statements

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P264	Wash contaminated skin thoroughly after handling.

Australian statement of hazardous/dangerous nature

Classified as Hazardous according to the criteria of NOHSC.
HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

SODIUM CARBONATE	**60-100%**
CAS-No.: 497-19-8	**EC No.: 207-838-8**
Classification (EC 1272/2008) Eye Irrit. 2 - H319	Classification (67/548/EEC) Xi;R36

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. Place unconscious person on the side in the recovery position and ensure breathing can take place. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Do not induce vomiting. Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention immediately. Continue to rinse.

4.2. Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop as described the casualty should be transferred to hospital as soon as possible. For further information, please refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water spray, foam, dry powder or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

Fire or high temperatures create: Carbon monoxide (CO). Carbon dioxide (CO2). Oxides of: Sodium.

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet. Avoid generating excess dust. Avoid contact with acids.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water.

6.4. Reference to other sections

For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Avoid contact with water. Avoid contact with acids. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove contaminated clothing. Do not eat, drink or smoke when using the product.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place. Avoid contact with acids.

Storage Class

Chemical storage.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments

NUI = Nuisance dust, WEL TWA 4mg/m3 Respirable Dust, 10 mg/m3 Total Dust.

No biological limit allocated.

SODIUM CARBONATE (CAS: 497-19-8)

DNEL

Inhalation.	Long Term	Local Effects	10 mg/m³

8.2. Exposure controls

Protective equipment




Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate general and local exhaust ventilation.

Respiratory equipment

No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. Wear mask supplied with: Dust filter P2 (for fine dust).

Hand protection

For prolonged or repeated skin contact use suitable protective gloves. Use protective gloves made of: Neoprene. or Rubber gloves are recommended.

Eye protection

Wear dust resistant safety goggles where there is danger of eye contact.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash hands after handling. Promptly remove any clothing that becomes wet or contaminated.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Powder, dust
Colour	White.
Odour	Odourless.
Solubility	Completely soluble in water
Melting point (°C)	851°C (1564°F)
Relative density	2.53 s.g @ 20°C
pH-Value, Conc. Solution	> 12 @ 10g/l
Solubility Value (G/100G H2O@20°C)	26g
Decomposition temperature (°C)	> 400°C (752°F)

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Reacts violently with strong acids. Carbon dioxide (CO_2). may be formed.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Avoid contact with: Water, moisture.

10.5. Incompatible materials

Materials To Avoid

Avoid contact with acids.

10.6. Hazardous decomposition products

Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

Acute Toxicity (Oral LD50)

2800 mg/kg Rat

Acute Toxicity (Dermal LD50)

> 2000 mg/kg Rat

Acute Toxicity (Inhalation LC50)

2300 Rat

Serious eye damage/irritation:

Irritating to eyes.

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May irritate and cause stomach pain, vomiting and diarrhoea.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Irritating to eyes. Particles in the eyes may cause irritation and smarting.

Route of entry

Skin and/or eye contact.

Target Organs

Eyes

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at M-ISWACOenv@slb.com. OSPAR have defined this chemical as PLONOR.

12.1. Toxicity

LC 50, 96 Hrs, Fish mg/l	300
EC 50, 48 Hrs, Daphnia, mg/l	265

12.2. Persistence and degradability

Degradability

The product solely consists of inorganic compounds which are not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential

The product is not bioaccumulating.

12.4. Mobility in soil

Mobility:

The product is soluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

Waste Class

The definitive European Waste code for this product will depend upon the final use that is made of this material. EWC-code: 06 02 05
Waste number: 7091 Inorganic salts and other solids.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). and (ADG).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable. Please contact MISDS@slb.com for info regarding transport in Bulk.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

Australian Standard for the Uniform Scheduling of Drugs and Poisons

No Poisons Schedule number allocated.

Australian Regulations

National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition [NOHSC: 2011 (2003)]. National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004) 3rd Edition]. National Occupational Health and Safety Commission's Exposure Standards for Atmospheric Contaminants in the occupational Environment [NOHSC:1003 (1995)]. Safe Work Australia. Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). ADG Code – Australian Dangerous Goods Code.

15.2. Chemical Safety Assessment

International Chemical Inventories

Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Australia (AICS), Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), Korea (TCCL / ECL), New Zealand (NZIoC), Phillipines (PICCS), United States (TSCA).

SECTION 16: OTHER INFORMATION

General information

HMIS Health -1 HMIS Flammability - 1 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

General revision. Updated according to CLP. Updated according to REACH Annex II.

Issued By	Sandra McWilliam
Revision Date	21-03-13
Revision	4
Supersedes date	13-03-08
SDS No.	11693
Safety Data Sheet Status	Approved.
Date	22-03-13
Signature	Laura McDonald
Signature 2	Nina Øvrehus

Risk Phrases In Full

R36	Irritating to eyes.

Hazard Statements In Full

H319	Causes serious eye irritation.

Safety Data Sheet

OSW24081

1 . Identification of the material and supplier

Product identifier : OSW24081

Product code : OSW24081

Product type : Liquid.

Identified uses : Oxygen scavenger.

Supplier's details : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2 . Hazards identification

Classification of the substance or mixture : SERIOUS EYE DAMAGE - Category 1

GHS label elements

Hazard pictograms :

Signal word : DANGER

Hazard statements : H318 - Causes serious eye damage.

Precautionary statements

Prevention : Wear eye or face protection.

Response : IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTER or physician.

Storage : Not applicable.

Disposal : Not applicable.

Precautionary statements (Code) : P280, P305 + P351 + P310

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

3 . Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
sodium metabisulphite	10 - 30	7681-57-4

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4 . First-aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : pain,watering,redness

Inhalation : No specific data.

Skin contact : pain or irritation,redness,blistering may occur

Ingestion : stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

4 . First-aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

5 . Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,sulfur oxides,metal oxide/oxides

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
sodium metabisulphite	**Safe Work Australia (Australia, 1/2014).** TWA: 5 mg/m³ 8 hours.

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

8 . Exposure controls/personal protection

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9 . Physical and chemical properties

Appearance

Physical state : Liquid.

Colour : Pale yellow

Odour : sulfur oxides

Odour threshold : Not available.

pH : 2.8 [Conc. (% w/w): 100%]

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

Relative density : 1.26 (20°C)

Solubility : Easily soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

10 . Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: acids and alkalis.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium metabisulphite	LD50 Oral	Rat	1131 mg/kg	-

Conclusion/Summary : May be harmful if ingested. Can cause target organ damage.

11 . Toxicological information

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
sodium metabisulphite	Eyes - Mild irritant	Rabbit	-	24 hours 100 milligrams	-

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Eyes : May cause eye irritation.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Not available.	

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : pain,watering,redness

Inhalation : No specific data.

Skin contact : pain or irritation,redness,blistering may occur

Ingestion : stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

11 . Toxicological information

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Product/ingredient name	Result	Species	Exposure
sodium metabisulphite	Acute LC50 32 mg/l Fresh water	Fish - Lepomis macrochirus	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
sodium metabisulphite	-3.7	-	low

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	Not regulated.	-	-	-	
ADG	Not regulated.	-	-	-	
IMDG	Not regulated.	-	-	-	
IATA	Not regulated.	-	-	-	

14 . Transport information

PG* : Packing group

Regulatory information	Environmental hazards	Additional information
ADR/RID Class	No.	Hazchem code -
ADN Class	No.	Hazchem code -
IMDG Class	No.	-
IATA Class	No.	-

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

Date of printing : 21 November 2016.

Date of issue/Date of revision : 21 November 2016

Date of previous issue : 27 November 2014

Version : 3

Key to abbreviations : ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Eye Dam. 1, H318	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Disclaimer

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

Safety Data Sheet

1 . Identification of the material and supplier

Product identifier : FORSA™ SCW24047 SCALE INHIBITOR

Product code : SCW24047

ADG : -

Product type : Liquid.

Identified uses : Scale Inhibitor

Supplier's details : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2 . Hazards identification

Classification of the substance or mixture : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A

GHS label elements

Hazard pictograms :

Signal word : WARNING

Hazard statements : H319 - Causes serious eye irritation.
H315 - Causes skin irritation.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection. Wash hands thoroughly after handling.

Response : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage : Not applicable.

Disposal : Not applicable.

Precautionary statements (Code) : P280, P264, P305 + P351 + P338

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

3 . Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
Organophosphorous salt ethanediol	10 - 30 1 - 5	Trade secret. 107-21-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4 . First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 15 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Get medical attention if adverse health effects persist or are severe. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : pain or irritation,watering,redness

Inhalation : No specific data.

Skin contact : irritation,redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

5 . Firefighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,halogenated compounds,metal oxide/oxides

Hazchem code : -

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
ethanediol	**Safe Work Australia (Australia, 1/2014). Absorbed through skin.** TWA: 10 mg/m³ 8 hours. Form: Particulate STEL: 104 mg/m³ 15 minutes. Form: Vapour TWA: 52 mg/m³ 8 hours. Form: Vapour TWA: 20 ppm 8 hours. Form: Vapour STEL: 40 ppm 15 minutes. Form: Vapour

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

8 . Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

9 . Physical and chemical properties

Appearance

Physical state : Liquid.

Colour : Colourless. to Brown.

Odour : Odourless.

Odour threshold : Not available.

pH : 4 to 5.5 [Conc. (% w/w): 1% - (H2O)]

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: >93.4°C (>200.1°F)

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

Relative density : 1.15 (20°C)

Solubility : Easily soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Kinematic (25°C): 4.9 cSt

Pour point : 0°C (32°F)

10 . Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Not available.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
ethanediol	LC50 Inhalation Vapour LD50 Dermal	Rat Mouse	>2.5 mg/l >3500 mg/kg	6 hours -

Conclusion/Summary : No known significant effects or critical hazards.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
ethanediol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	1 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	6 hours 1440 milligrams	-
	Skin - Mild irritant	Rabbit	-	555 milligrams	-

Conclusion/Summary

Skin : May cause skin irritation.

Eyes : May cause eye irritation.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Not available.	

Information on likely routes of exposure : Not available.

Potential acute health effects

11 . Toxicological information

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : pain or irritation,watering,redness

Inhalation : No specific data.

Skin contact : irritation,redness

Ingestion : No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : No known significant effects or critical hazards.

Product/ingredient name	Result	Species	Exposure
ethanediol; ethylene glycol	Acute EC50 6500 to 13000 mg/l Fresh water	Algae	72 hours
	Acute EC50 >100 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 >100000 µg/l Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 10000000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 72860 mg/l Fresh water	Fish	96 hours
	Acute LC50 10000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
ethanediol; ethylene glycol	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
ethanediol	-1.36	-	low

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	Not regulated.	-	-	-	
ADG	Not regulated.	-	-	-	
IMDG	Not regulated.	-	-	-	
IATA	Not regulated.	-	-	-	

PG* : Packing group

Regulatory information	Environmental hazards	Additional information
ADR/RID Class	No.	**Hazchem code** -
ADG Class	No.	**Hazchem code** -
IMDG Class	No.	-
IATA Class	No.	-

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

15 . Regulatory information

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

Date of printing : 19 April 2017.

Date of issue/Date of revision : 19 April 2017

Date of previous issue : 23 December 2016

Version : 3.01

Key to abbreviations : ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Skin Irrit. 2, H315 Eye Irrit. 2A, H319	Calculation method Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Disclaimer

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

Safety Data Sheet

XC24117

1 . Identification of the material and supplier

Product identifier : XC24117

Product code : XC24117

ADG : CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glutaraldehyde)

Product type : Liquid.

Identified uses : Biocide.

Supplier's details : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2 . Hazards identification

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN CORROSION/IRRITATION - Category 1B
RESPIRATORY SENSITIZATION - Category 1
SKIN SENSITIZATION - Category 1
ACUTE AQUATIC HAZARD - Category 2

GHS label elements

Hazard pictograms :

Signal word : DANGER

Hazard statements : H302 + H332 - Harmful if swallowed or if inhaled.
H314 - Causes severe skin burns and eye damage.
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 - May cause an allergic skin reaction.
H401 - Toxic to aquatic life.

Precautionary statements

Prevention : Wear protective gloves: > 8 hours (breakthrough time): Butyl rubber gloves. Nitrile rubber gloves.. Wear eye or face protection. Wear protective clothing. Avoid release to the environment.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Immediately call a POISON CENTER or physician. IF IN EYES: Immediately call a POISON CENTER or physician.

Storage : Store locked up.

2 . Hazards identification

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Precautionary statements (Code) : P280, P273, P304 + P340 + P310, P301 + P310 + P331, P303 + P361 + P353 + P310, P305 + P310, P405, P501

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

3 . Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
glutaral Quaternary ammonium compounds, benzyl-C12-14-alkyldimethyl, chlorides	10 - 30 1 - 5	111-30-8 .68424-85-1 (outside EU)

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4 . First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. In the event of any complaints or symptoms, avoid further exposure.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Call a poison center or physician. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

4 . First aid measures

Over-exposure signs/symptoms

Eye contact : pain,watering,redness

Inhalation : wheezing and breathing difficulties,asthma

Skin contact : pain or irritation,redness,blistering may occur

Ingestion : stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

5 . Firefighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide

Hazchem code : 2X

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6 . Accidental release measures

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitisation problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
glutaral	**Safe Work Australia (Australia, 1/2014). Skin sensitiser.** TWA: 0.1 ppm 8 hours. TWA: 0.41 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8 . Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. Recommended: > 8 hours (breakthrough time): Butyl rubber gloves. Nitrile rubber gloves.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

9 . Physical and chemical properties

Appearance

Physical state : Liquid.

Colour : Clear. / Colourless.

Odour : Fruity. Medicinal product [Strong]

Odour threshold : Not available.

pH : 4 to 6 [Conc. (% w/w): 10% - (H2O)]

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

9 . Physical and chemical properties

Relative density : 1.033 to 1.053 (20°C)

Solubility : Soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

10 . Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glutaral	LD50 Dermal LD50 Oral	Rabbit Rat	1749 mg/kg 200 mg/kg	- -
Quaternary ammonium compounds, benzyl-C12-14-alkyldimethyl, chlorides	LD50 Oral	Rat	426 mg/kg	-

Conclusion/Summary : Harmful if inhaled. May be harmful if ingested. Can cause target organ damage. Adverse health effects could include the following: central nervous system depression

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
glutaral	Eyes - Severe irritant	Rabbit	-	24 hours 250 Micrograms	-
	Eyes - Severe irritant	Rabbit	-	1 milligrams	-
	Skin - Severe irritant	Human	-	72 hours 6 milligrams Intermittent	-
	Skin - Mild irritant	Rabbit	-	13 milligrams	-
	Skin - Severe irritant	Rabbit	-	24 hours 2 milligrams	-
Quaternary ammonium compounds, benzyl-C12-14-alkyldimethyl, chlorides	Skin - Severe irritant	Rabbit	-	25 milligrams	-

Conclusion/Summary

Skin : Causes pain and burns in contact with skin. May cause permanent skin damage.

Eyes : Risk of serious damage to eyes. May cause eye burns and permanent eye injury.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Conclusion/Summary

11 . Toxicological information

Skin : May cause sensitisation by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Respiratory : May cause sensitisation by inhalation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Not available.	

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : pain,watering,redness

Inhalation : wheezing and breathing difficulties,asthma

Skin contact : pain or irritation,redness,blistering may occur

Ingestion : stomach pains

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

11 . Toxicological information

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : Toxic to aquatic organisms. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Product/ingredient name	Result	Species	Exposure
glutaral; 1,5-pentanedial	Acute EC50 0.61 mg/l Acute EC50 0.69 mg/l Acute LC50 13 mg/l	Algae Daphnia Fish	72 hours 48 hours 96 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
glutaral; 1,5-pentanedial	-	90 to 100 % - Readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
glutaral; 1,5-pentanedial Quaternary ammonium compounds, benzyl-C12-14-alkyldimethyl, chlorides	- -	- -	Readily Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
glutaral	-0.36	-	low

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

14 . Transport information

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glutaraldehyde)	8	III	
ADG	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glutaraldehyde)	8	III	
IMDG	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glutaraldehyde)	8	III	
IATA	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glutaraldehyde)	8	III	

PG* : Packing group

Regulatory information	Environmental hazards	Additional information**
ADR/RID Class	No.	**Hazchem code** 2X
ADG Class	No.	**Hazchem code** 2X
IMDG Class	No.	-
IATA Class	No.	-

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

Ingredient name	Schedule
methanol	Restricted hazardous chemical [For spray painting if the substance contains more than 1% by volume]

Australia inventory (AICS) : All components are listed or exempted.

15 . Regulatory information

References : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

Date of printing : 13 November 2017.

Date of issue/Date of revision : 13 November 2017

Date of previous issue : 1 January 2017

Version : 5

Key to abbreviations : ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H302	Calculation method
Acute Tox. 4, H332	Calculation method
Skin Corr. 1B, H314	Calculation method
Resp. Sens. 1, H334	Calculation method
Skin Sens. 1, H317	Calculation method
Aquatic Acute 2, H401	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Disclaimer

16 . Other information

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

Safety Data Sheet

XC24302

1 . Identification of the material and supplier

Product identifier : XC24302

Product code : XC24302

ADG : FLAMMABLE LIQUID, CORROSIVE, N.O.S. (contains isopropanol)

Product type : Liquid.

Identified uses : Biocide.

Supplier's details : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2 . Hazards identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
ACUTE AQUATIC HAZARD - Category 2

GHS label elements

Hazard pictograms :

Signal word : WARNING

Hazard statements : H226 - Flammable liquid and vapour.
H319 - Causes serious eye irritation.
H315 - Causes skin irritation.
H336 - May cause drowsiness or dizziness.
H401 - Toxic to aquatic life.

Precautionary statements

Prevention : Wear protective gloves: > 8 hours (breakthrough time): Rubber gloves. Nitrile gloves. Neoprene gloves.. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Avoid release to the environment.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

Storage : Keep cool.

2 . Hazards identification

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Precautionary statements (Code) : P280, P210, P241, P273, P304 + P340, P303 + P361 + P353, P235, P501

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

3 . Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
Isopropyl alcohol	10 - 30	67-63-0
Alkyl diamine acetate	10 - 30	Trade secret.
oxydipropanol	1 - 5	25265-71-8

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4 . First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 15 minutes. Check for and remove any contact lenses. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Get medical attention if adverse health effects persist or are severe. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness.

Skin contact : Causes skin irritation.

Ingestion : Can cause central nervous system (CNS) depression.

Over-exposure signs/symptoms

Eye contact : pain or irritation,watering,redness

Inhalation : nausea or vomiting,headache,drowsiness/fatigue,dizziness/vertigo,unconsciousness

Skin contact : irritation,redness

4 . First aid measures

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

5 . Firefighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Flammable liquid and vapour. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide

Hazchem code : •3Y

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and material for containment and cleaning up

6 . Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Isopropyl alcohol	**Safe Work Australia (Australia, 1/2014).** STEL: 1230 mg/m³ 15 minutes. STEL: 500 ppm 15 minutes. TWA: 983 mg/m³ 8 hours. TWA: 400 ppm 8 hours.
oxydipropanol	**TRGS900 AGW (Germany, 6/2016). Absorbed through skin.** TWA: 100 mg/m³ 8 hours. Form: Inhalable

8 . Exposure controls/personal protection

	fraction PEAK: 200 mg/m³ 15 minutes. Form: Inhalable fraction

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. Recommended: > 8 hours (breakthrough time): Rubber gloves. Nitrile gloves. Neoprene gloves.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

9 . Physical and chemical properties

Appearance

Physical state : Liquid.

Colour : Colourless to light yellow.

Odour : Alcohol-like.

Odour threshold : Not available.

pH : 5.5 to 6.5

Melting point : -34°C (-29.2°F)

Boiling point : Not available.

9 . Physical and chemical properties

Flash point : Closed cup: 24°C (75.2°F) [Pensky-Martens.]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

Relative density : 0.945 (20°C)

Solubility : Easily soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

10 . Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Not available.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Isopropyl alcohol	LD50 Oral	Rat	5000 mg/kg	-
	LD50 Oral	Rat	5045 mg/kg	-
oxydipropanol	LD50 Oral	Rat	14850 mg/kg	-

Conclusion/Summary : No known significant effects or critical hazards.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Isopropyl alcohol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-

Conclusion/Summary

Skin : May cause skin irritation.

Eyes : May cause eye irritation.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

11 . Toxicological information

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Isopropyl alcohol	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Not available.	

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness.

Skin contact : Causes skin irritation.

Ingestion : Can cause central nervous system (CNS) depression.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : pain or irritation,watering,redness

Inhalation : nausea or vomiting,headache,drowsiness/fatigue,dizziness/vertigo,unconsciousness

Skin contact : irritation,redness

Ingestion : No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

11 . Toxicological information

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : Toxic to aquatic organisms.

Product/ingredient name	Result	Species	Exposure
propan-2-ol; isopropanol	Acute LC50 9714 mg/l Fresh water Acute LC50 9640 mg/l Fresh water	Daphnia Fish	24 hours 96 hours
Alkyl diamine acetate	Acute EC50 104 ppb Fresh water Acute LC50 577 ppb Marine water	Daphnia - Daphnia magna Fish - Menidia menidia	48 hours 96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
propan-2-ol; isopropanol	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Isopropyl alcohol oxydipropanol	0.05 -0.462	- 0.3 to 4.6	low low

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	UN1993	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (contains isopropanol)	3	III	
ADG	UN1993	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (contains isopropanol)	3	III	
IMDG	UN1993	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (contains isopropanol)	3	III	

14 . Transport information

IATA	UN1993	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (contains isopropanol)	3	III	

PG* : Packing group

Regulatory information	Environmental hazards	Additional information**
ADR/RID Class	No.	**Special provisions** 640 (E) **Tunnel code** (D/E) **Hazchem code** 3Y
ADG Class	No.	**Hazchem code** •3Y
IMDG Class	No.	-
IATA Class	No.	-

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

15 . Regulatory information

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

Date of printing : 27 July 2017.

Date of issue/Date of revision : 27 July 2017

Date of previous issue : 29 April 2013

Version : 2

Key to abbreviations :
ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Flam. Liq. 3, H226	On basis of test data
Skin Irrit. 2, H315	Calculation method
Eye Irrit. 2A, H319	Calculation method
STOT SE 3, H336	Calculation method
Aquatic Acute 2, H401	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Disclaimer

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

Safety Data Sheet

CGW24400 CORROSION INHIBITOR

1 . Identification of the material and supplier

Product identifier : CGW24400 CORROSION INHIBITOR

Product code : CGW24400

ADG : THIOGLYCOL SOLUTION

Product type : Liquid.

Identified uses : Corrosion inhibitor

Supplier's details : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2 . Hazards identification

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 3
ACUTE TOXICITY (dermal) - Category 3
ACUTE TOXICITY (inhalation) - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
SKIN SENSITISATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE (heart, liver) - Category 2
SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1

GHS label elements

Hazard pictograms :

GHS06 GHS05 GHS08 GHS09

Signal word : DANGER

Hazard statements : H301 + H311 + H331 - Toxic if swallowed, in contact with skin or if inhaled.
H318 - Causes serious eye damage.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H373 - May cause damage to organs through prolonged or repeated exposure. (heart, liver)
H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : Wear protective gloves: > 8 hours (breakthrough time): Nitrile or Neoprene gloves.. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Do not breathe vapour. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

2 . Hazards identification

Response : Collect spillage. Get medical attention if you feel unwell. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. IF ON SKIN: Take off immediately all contaminated clothing. Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Precautionary statements (Code) : P280, P273, P260, P304 + P340, P301 + P310, P305 + P310, P405, P501

Supplemental label elements : Not applicable.

Other hazards which do not result in classification : None known.

3 . Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
2-mercaptoethanol	30 - 60	60-24-2

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4 . First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Get medical attention immediately. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

4 . First aid measures

Inhalation : Toxic if inhaled.

Skin contact : Toxic in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Toxic if swallowed.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following: pain,watering,redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following: pain or irritation,redness,blistering may occur

Ingestion : Adverse symptoms may include the following: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

5 . Firefighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,sulfur oxides

Hazchem code : 2X

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6 . Accidental release measures

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

8 . Exposure controls/personal protection

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. Recommended: > 8 hours (breakthrough time): Nitrile or Neoprene gloves.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

9 . Physical and chemical properties

Appearance

Physical state : Liquid. [Clear.]

Colour : Colourless.

Odour : Mercaptan

Odour threshold : Not available.

pH : 4 [Conc. (% w/w): 100%]

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: >100°C (>212°F) [SFCC]

Evaporation rate : Not available.

Flammability (solid, gas) : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

Lower and upper explosive (flammable) limits : Lower: 2.3%
Upper: 18%

Vapour pressure : Not available.

Vapour density : Not available.

Relative density : 1.0671 (15.6°C)

Solubility : Easily soluble in the following materials: cold water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Dynamic (4.44°C): 3.7 cP

Pour point : -33.889°C (-29°F)

10 . Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials and alkalis.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-mercaptoethanol	LC50 Inhalation Vapour	Rat	2 mg/l	4 hours
	LD50 Dermal	Rabbit	112 to 224 mg/kg	-
	LD50 Oral	Rat	131 mg/kg	-
CGW24400 CORROSION INHIBITOR	LD50 Dermal	Rat	290 to 1000 mg/kg	-

Conclusion/Summary : May be toxic if inhaled. May be toxic by skin absorption. May be toxic if ingested. Can cause target organ damage. Adverse health effects could include the following: central nervous system depression

Irritation/Corrosion

Skin : May cause skin irritation.

Eyes : Risk of serious damage to eyes. May cause eye burns and permanent eye injury.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Skin : May cause sensitisation by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Respiratory : No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
2-mercaptoethanol	Category 2	Oral	heart and liver

Aspiration hazard

Name	Result
Not available.	

Information on likely routes of exposure : Routes of entry anticipated: Dermal, Inhalation.

11 . Toxicological information

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Toxic if inhaled.

Skin contact : Toxic in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Toxic if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following: pain,watering,redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following: pain or irritation,redness,blistering may occur

Ingestion : Adverse symptoms may include the following: stomach pains

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Product/ingredient name	Result	Species	Exposure
2-mercaptoethanol	Acute EC50 19 mg/l Fresh water	Algae	72 hours
	Acute EC50 65 mg/l Marine water	Algae - Skeletonema costatum	72 hours
	Acute EC50 0.4 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 53.4 mg/l Marine water	Crustaceans - Acartia tonsa	48 hours
	Acute LC50 37 mg/l Fresh water	Fish	96 hours
	Acute LC50 92.5 mg/l Marine water	Fish - Cyprinodon variegatus	96 hours

Persistence and degradability

Not available.

Product/ingredient name	Test	Result	Dose	Inoculum
2-mercaptoethanol	OECD 306	47 % - Not readily - 28 days	-	-

12 . Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
2-mercaptoethanol	-	-	Readily

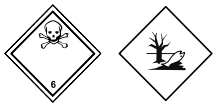
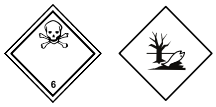
Product/ingredient name	$LogP_{ow}$	BCF	Potential
2-mercaptoethanol	-0.056	-	low

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	UN2966	THIOGLYCOL SOLUTION	6.1	II	
ADG	UN2966	THIOGLYCOL SOLUTION	6.1	II	
IMDG	UN2966	THIOGLYCOL SOLUTION	6.1	II	
IATA	UN2966	THIOGLYCOL SOLUTION	6.1	II	

PG* : Packing group

Regulatory information	Environmental hazards	Additional information
ADR/RID Class	Yes.	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg. **Hazchem code** 2X
ADG Class	No.	**Hazchem code** 2X
IMDG Class	Yes.	The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg. **Emergency schedules** F-A S-A
IATA Class	No.	The environmentally hazardous substance mark may appear if required by other transportation regulations.

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14 . Transport information

Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances.**

National Code of Practice for the Labelling of Workplace Substances.
National Code of Practice for the Preparation of Material Safety Data Sheets.
Approved Criteria for Classifying Hazardous Substances.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

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Key to abbreviations : ADG = Australian Dangerous Goods
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

16 . Other information

Classification	Justification
Acute Tox. 3, H301	Calculation method
Acute Tox. 3, H311	On basis of test data
Acute Tox. 3, H331	Calculation method
Skin Irrit. 2, H315	Calculation method
Eye Dam. 1, H318	Calculation method
Skin Sens. 1, H317	Calculation method
STOT RE 2, H373 (heart, liver)	Calculation method
Aquatic Acute 1, H400	Calculation method
Aquatic Chronic 1, H410	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

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