Environment Plan Summary

Thevenard Island Joint Venture
Production and Cessation

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1.0 Introduction

This document summarises the Environment Plan (EP) for activities conducted during production and the cessation phase of the Thevenard Island Retirement Project (the Project), accepted by the Western Australian Department of Mines and Petroleum on 2 December 2013.

The EP Summary has been prepared in accordance with Regulation 11(7) of the;

- Petroleum (Submerged Lands) (Environment) Regulations 2012,
- Petroleum and Geothermal Energy Resources (Environment) Regulations 2012, and
- Petroleum Pipelines (Environment) Regulations.

1.1 Overview

The Thevenard Island fields and production facility are now reaching the end of field life. Chevron, on behalf of the Thevenard Island Joint Venture (TVIJV) partners, propose to cease production on TVI in Quarter one (Q1) 2014, followed by a care and maintenance period, and then planned retirement activities will commence.

The Titles associated with the Thevenard Island fields and production facilities, and that are the subject of the EP, are summarised in Table 1.1.

Chevron operates the petroleum title areas, which contain Saladin, Cowle, Yammaderry, Crest, Roller and Skate oilfield developments located on Thevenard Island (TVI) and in surrounding waters.

Table 1.1: Thevenard Island Joint Venture Petroleum Titles

Title Name	Title Type	Legislation
TPL 11	Pipeline Licence	*Petroleum (Submerged Lands) Act, 1982*
TPL 6	Pipeline Licence	*Petroleum (Submerged Lands) Act, 1982*
TL/7	Production Licence	*Petroleum (Submerged Lands) Act, 1982*
TL/4	Production Licence	*Petroleum (Submerged Lands) Act, 1982*
TR 4	Retention Lease	*Petroleum (Submerged Lands) Act, 1982*
EP 357	Exploration Permit	*Petroleum and Geothermal Energy Resources Act 1967*
L12	Production Licence	*Petroleum and Geothermal Energy Resources Act 1967*
L13	Production Licence	*Petroleum and Geothermal Energy Resources Act 1967*
PL 15	Pipeline Licence	*Petroleum Pipelines Act, 1969*
PL 21	Pipeline Licence	*Petroleum Pipelines Act, 1969*

1.2 Location

TVI, a Nature Conservation Reserve (Reserve No. 33174) vested in the Conservation Estate of WA, is located approximately 25 km north-west of Onslow and 70 km south-west of Barrow Island (BWI) in the Carnarvon Basin, Western Australia (WA). Table 1.2 provides coordinates for the general location of TVI.

TVI is approximately 5 km in length, 1 km at its greatest width and covers an area of approximately 550 hectare (ha).

The onshore footprint for the facilities described in the EP are located at the north-eastern end of TVI, on a 25 ha site leased from the Department of Parks and Wildlife (DPaW), formerly the Department of Environment and Conservation (DEC) (Petroleum Lease 15 (PL15)). Adjacent to the Chevron-operated lease is a small lease operated by Mackerel Islands Pty Ltd, which includes a small recreational fishing resort, and the airstrip, which is utilised by Chevron for personnel transfer to and from TVI. Infrastructure associated with production on TVI extends from TVI to Tubridgi in WA State waters.

Table 1.2: Thevenard Island Location

Location Point GDA94	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Thevenard Island	21	27	33.00	115	0	34.00

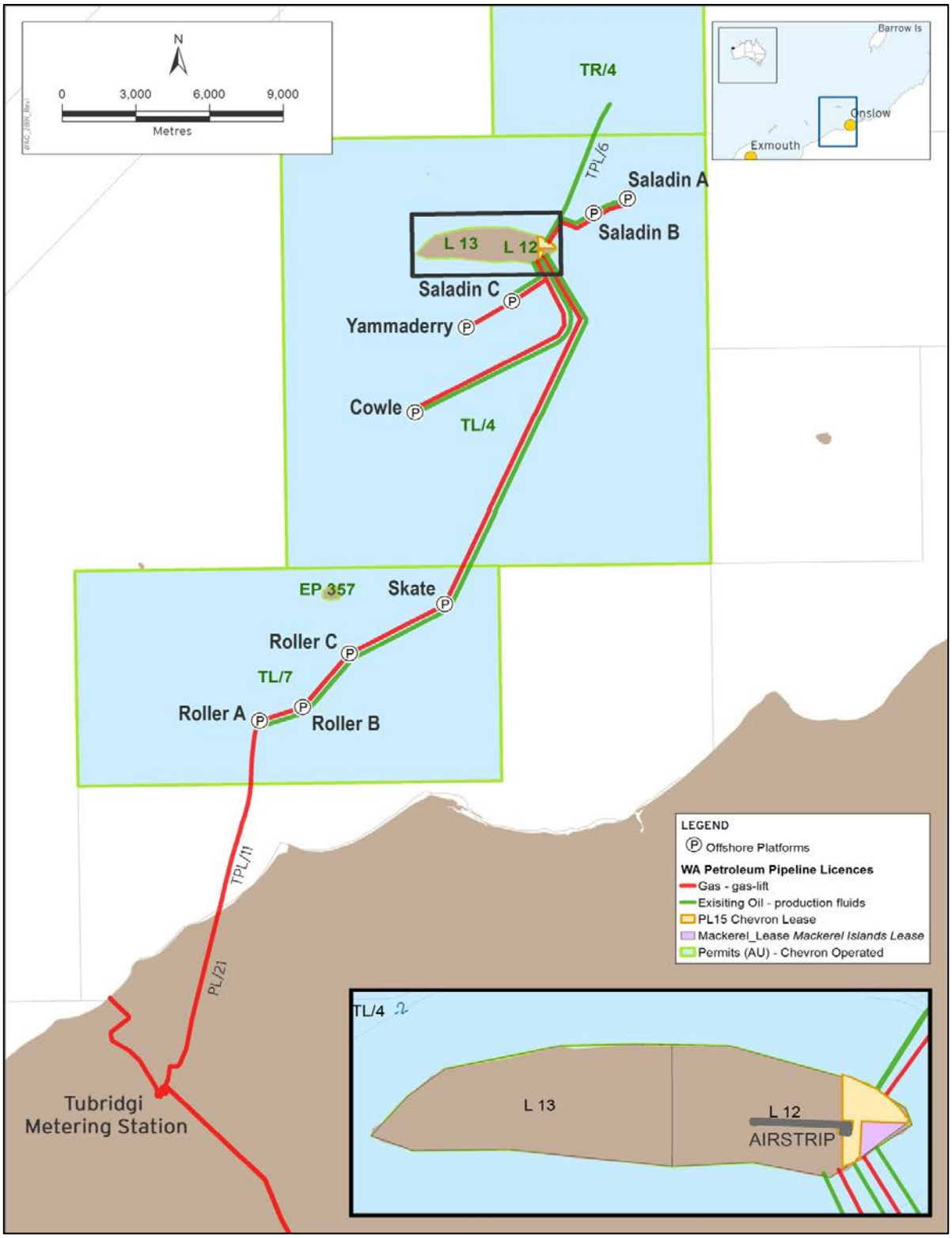

Figure 1.1: TVI Lease Boundaries

1.3 Timeframe

Table 1.2 outlines the stages and indicative durations of project activities. The EP includes activities related to the current Production at Thevenard Island, and the following Cessation of Production scope of work.

The care and maintenance, and retirement activities will be included in separate environment plans prior to those activities occurring.

Table 1.3: Retirement Project Stages and Associated Primary Activities

Phase	Indicative Duration	Indicative Timing	Primary Activities
Cessation of Production	~ 4 months	Early 2014	Production ceased. Pipelines flushed, cleaned and/or pigged. Wells shut in (valves shut). All vessels cleaned and isolated.
Care & Maintenance	~ 8 months	Late 2014	Limited activities required to ensure TVI and associated facilities remain in a safe and stable condition. Planning and preparation for retirement phase. Oily Waste Storage Pond cleaned.
Retirement	~ 5+ years	2015 onwards	Wells plugged and abandoned. Onshore and offshore infrastructure decommissioned. Remediation and rehabilitation activities on TVI commenced.

1.4 Operator Details

The Operator for the project is Chevron Australia Pty Ltd, on behalf of TVIJV partners:

- Santos Offshore Pty Ltd
- Mobil Australia Resources Company Pty Ltd

2.0 Activity Description

Chevron undertakes a range of oil production and export activities on TVI. These include both onshore and offshore production facilities that produce light crude, associated gas and produced water distributed via flowlines to a central processing plant located on the TVI lease.

TVI's onshore facilities include accommodation, warehouses, workshops, a flare pit, tulip flare, leach drains, power generation facilities, a wastewater treatment plant (WWTP) and a reverse osmosis (RO) water facility for producing potable water. Transport facilities include an airstrip, paved access roads, a barge landing and a jetty.

Mainland onshore facilities consist of the onshore section of the Roller/Skate gas export pipeline and the Tubridgi Metering Station. TVI is currently not exporting gas and the pipeline is isolated at the Tubridgi Metering Station.

Offshore infrastructure near TVI consists of platforms, monopods, wells, moorings, subsea pipelines, oil export pipelines and an associated tanker mooring area, which incorporates the oil export pipeline, located 6 km north-north-east of TVI. There are three offshore tripod platforms and six monopods (all of which are unmanned) as detailed in Table 2.1.

Table 2.1: Offshore Tripod and Monopod Platforms

Location Point GDA94	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Monopods						
Roller A	21	38	27.32	114	54	23.30
Roller B	21	38	9.20	114	55	24.61

Roller C	21	36	55.27	114	56	31.74
Skate	21	35	47.85	114	58	47.57
Yammaderry	21	29	21.63	114	59	23.49
Cowle	21	31	19.66	114	58	9.42
Tripods						
Saladin A	21	26	24.63	115	3	13.88
Saladin B	21	26	44.35	115	2	25.70
Saladin C	21	28	45.64	115	0	28.31

The TVI onshore facilities collects production fluids gathered from the offshore wells at monopods and platforms for processing.

There are eleven onshore production wells on TVI, with a number of wells since converted to gas and water injection wells. There are also three water disposal wells on the island. All production wells are gas-lifted using gas supplied from TVI via the gas lift pipelines.

Processing production fluids includes separating produced fluids and feeding crude oil to a shipping pipeline (Saladin Tanker Loading Line (STLL)) for loading tankers moored approximately 6 km offshore to the north of TVI. There is approximately one tanker loading ("lifting") per year at the current TVI production rates.

Gas fed forward to the Roller system is compressed, treated and exported to the Roller monopods for gas lift, gas injection and utility gas. Gas fed to the Saladin system is compressed and exported as follows:

- To Saladin A & B and onshore wells for gas lift, gas injection and utility gas, as required,
- To the Yammaderry and Cowle monopods and Saladin platforms for gas lift,
- For gas injection to maintain reservoir pressure,
- For utility gas on TVI; and
- To the flare (excess).

Produced formation water (PFW) is filtered and reinjected into the reservoir via the Saladin-11 well to maintain reservoir pressure and assist in oil recovery, and the remainder injected underground through three deep (greater than (>) 1,000 m) water disposal wells, with a maximum oil-in-water concentration of less than or equal to 200 ppm.

Chevron and the TVIJV partners have decided to cease production and export activities on TVI in Q1 2014. The cessation phase of the Project will require shut-in and isolation, flushing and cleaning of infrastructure to allow for the safe and acceptable custody transfer to the TVI Retirement Project. Selected equipment will be preserved to assist with the TVI Retirement Project, such as utilities, accommodation and well monitoring facilities.

3.0 Description of the Environment

3.1 Physical Environment

TVI is a low (average height above sea level of 5 m Australian Height Datum (AHD)), relatively flat, vegetated Holocene sand cay approximately 5 km long by 1 km wide and covers an area of approximately 5,500 ha (LeProvost et al., 1987). No natural drainage patterns exist on TVI and rainfall infiltrates the sandy soils and directly recharges the shallow unconfined superficial groundwater. The unconfined groundwater aquifer is present within the Aeolian sands between 1 – 7 m (Golder 2011).

Silt and sand sheets overlying Pleistocene limestone pavement broadly classify the surrounding shallow sea. The silt and sand sheets are extensive and form most, if not all, of the seafloor substrate over the Roller field. They are also common along near shore areas of the WA coastline.

3.2 Biological Environment

Vegetation on TVI Chevron lease consists of disturbed or semi-disturbed ground (Astron Environmental, 2006). Historical records do not include vegetation associations that were present within PL15 prior to clearing.

According to the DPaW Declared Rare and Priority Flora list for the Pilbara region, no Declared Rare Flora (DRF) species are known to occur on TVI (DEC, 2009); however, TVI contains identified Priority 2 flora specie, *Carpobrotus sp. Thevenard Island*.

Migratory shorebird and seabird species use TVI as a stopover. Surveys on TVI recorded 72 bird species; many include listed species under the *Environment Protection and Biodiversity Conservation Act 1999* and the *Environmental Protection Act 1986*.

Sandy beaches are utilised by marine turtles and birds for nesting. Surrounding sand veneered subtidal limestone pavement colonised by seagrasses, burrowing infauna, macroalgae and soft coral and extensive macroalgal habitats at the western end of TVI provide feeding habitat for marine turtles. Low density green and flatback turtle nesting is known to occur on TVI, although it is not considered to be critical habitat. Other turtle species may be encountered in the offshore areas albeit in low numbers.

Migrating humpback whales may be encountered in the offshore area of TVI between September and November, however the offshore area does not contain recognised migratory routes, known feeding, breeding or resting areas.

Whale sharks are known to pass through and potentially feed in the offshore area of TVI while migrating to aggregation areas on the Ningaloo Coast.

3.3 Socio-Economic Environment

TVI is a DPaW ‘other than Class A’ (formerly Class C) Nature Conservation (Reserve No. 5/08/190/004). TVI and surrounding islands are also listed within the National Estate Register (No. 5/08/190/004) for the conservation value of their seabed and turtle nesting sites, and populations of small mammals on some islands.

TVI forms part of the Thalanyji Native Title Consent Determination registered on the National Native Title Tribunal Register and a search of the Aboriginal Heritage Inquiry System for TVI reported one Indigenous heritage place (Site ID. 11403 -midden/ scatter) located to the west of the Chevron lease area on TVI.

A search of the Aboriginal Heritage Inquiry System for the Tubridgi Metering Station indicated that the site is located within a Registered Aboriginal Site: Urala Midden 4 (7061) of artefact/scatter and midden/scatter type. Urala Midden 4 (7061) is not conclusive, as sites may not have been recorded in the Register of Aboriginal Sites. Therefore, Chevron is conducting a heritage survey of the Tubridgi Metering Station and surrounds, and the onshore pipeline route to the Tubridgi Metering Station, to identify any further sites of importance.

The Wheatstone Project trunkline corridor and shipping channel location is within the offshore area of TVI, for which dredging and construction was commenced and is expected to continue until 2014.

The TVI offshore areas overlap with three state-managed commercial fishing zones:

- Onslow Prawn Managed Fishery (Areas 1 and 2)
- Mackerel Managed Fishery (Area 2)
- Pearl Oyster Managed Fishery (Zone 1)

Previous consultations with the WA Department of Fisheries (DoF) identified that only low levels of commercial fishing may occur within these areas.

The region's major marine tourism and recreational attractions are primarily related to fishing and diving. Peak recreational fishing periods occur between late October and early February.

4.0 Environmental Hazards and Controls

An Environmental Risk Assessment Workshop (ENVID) was conducted on 2 August for the cessation phase of the Project in accordance with the procedures outlined in AS/NZS International Organisation for Standardisation (ISO) 31000:2009 Risk Management and HB 203:2012 Managing Environment-Related Risk, using the Chevron Integrated Risk Prioritization Matrix. The risk assessment for production activities was based on the *Thevenard Island Environmental Aspects Register* (Doc ID: 090140004), which is reviewed on an annual basis by a cross-functional team and risks reassessed in accordance with Chevron's Risk Management Process.

The results of the ENVID and review of the *Thevenard Island Environmental Aspects Register* (Doc ID: 090140004) were used to develop the performance objectives, performance standards and measurement criteria detailed in Appendix 1.

5.0 Management Approach

The Environment Plan has been prepared to ensure that the activities described above in Section 1.3 are conducted in a manner that protects environmental values and reduces impacts to the environment as far as practicable.

Chevron Australia is committed to conducting activities associated with production and the cessation phase of the Project in an environmentally responsible manner, and aims to implement best practice environmental management as part of a program of continual improvement. To meet this commitment, objectives have been defined that relate to the management of the identified environmental risks for production and the cessation phase of the Project.

Chevron Australia has prepared the internal Australasian Business Unit (ABU) Compliance Assurance process to manage compliance. An internal Audit Schedule has been developed and will be maintained for production and the cessation phase of the Project that includes audits of the Project's environmental performance and compliance with development Conditions, State and Commonwealth legislation.

The production and the cessation phase of the Project will use a number of routine internal reporting formats to effectively implement the requirements of the Environment Plan. These reports include information on a number of relevant environmental aspects, such as details of environmental incidents (if any), environmental statistics and records, records of environmental audits and inspections undertaken, status of environmental monitoring programs, and tracking of environmental performance against performance indicators and targets.

6.0 Consultation

Throughout the planning phases of this project Chevron have liaised with the major identified stakeholders of DMP, DPaW and DER. Chevron will continue to liaise with these stakeholders throughout production and the cessation phase of the Project.

7.0 Contact

Further information regarding Thevenard Island is available at the Chevron Australia website; www.chevronaustralia.com.

Further information may also be obtained by emailing ask@chevron.com or writing to:

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8.0 References

Astron Environmental Services. 2006. Thevenard Island Terrestrial Biological Monitoring and Revegetation – Annual Report 2005-2006. Unpublished report to Chevron Australia Pty Ltd, December 2006.

Department of Environment and Conservation. 2009a. FloraBase: Western Australian Flora. Available from: http://florabase.calm.wa.gov.au/conservationtaxa. Accessed 18/12/2009.

Golder 2011, Thevenard Island Conceptual Site Model. 087643491-023-R-Rev3.

LeProvost, Semeniuk and Chalmer. 1987. Saladin Oilfield Development, Environmental Review and Management Program. Unpublished report to WAPET. Report No. R114, LeProvost, Semeniuk & Chalmer, Perth, Western Australia.

Appendix 1 Hazards and Controls

Environmental Aspect	Objectives	Potential Impacts	Safeguards
Vegetation and Habitat	• No impact to terrestrial vegetation or marine benthic habitat or vegetation outside existing Chevron Approved lease and licence areas unless regulatory approval is received	• Terrestrial Habitat and flora loss / disturbance from vegetation clearing outside Chevron lease and at Tubridgi Metering Station • Marine benthic habitat and vegetation disturbance during barge landing activities and offshore vessel anchoring • Erosion of coastal areas from vegetation clearing	• All personnel have completed the ABU North West Core and Environment inductions and the TVI Site specific induction • Vehicles undertaking work will be operated within Chevron lease area only, unless approval is granted by DPaW, and speed does not exceed 40 km/h • No clearing will occur outside of the Chevron lease area, unless approval is granted by DPaW • TVI mooring and vessel presence records confirm anchoring is only within Chevron-approved areas, oil tankers use fixed mooring points only and loading and unloading of equipment from barges use the barge landing area and jetty only • Clump weights and anchors located away from areas of environmental sensitivity
Fauna	• No fauna injury / casualty attributable to TVI operations	• Terrestrial fauna injury or casualty from entrapment in facilities or heat radiation from flaring • Terrestrial fauna injury or casualty from vehicle collision • Marine fauna injury or casualty from vessel collision • Behavioural disturbance to marine fauna from vessel noise and lighting • Behavioural disturbance to marine fauna from RO Brine discharge • Behavioural disturbance of fauna as a result of workforce recreation including beach access and unauthorised feeding • Behavioural disturbance to terrestrial fauna resulting from noise and light emissions of facilities, vehicles and aircraft	• All personnel have completed the ABU North West Core and Environment inductions and the TVI Site specific induction • Fauna handling staff hold a DPaW Regulation 15 licence • Vehicles undertaking work will be operated within Chevron lease area only, unless approval is granted by DPaW, and speed does not exceed 40 km/h • Clump weights located away from areas of environmental sensitivity • Oily Waste Storage Pond, API separator, drains and sumps have fauna exclusion/egress controls in place and operational • Vegetation surrounding flares is maintained • Gas is flared through pit flare (unless undergoing maintenance or emergency shutdown, in which case tulip flare may be used) • RO Brine is discharged from an outfall 1,400 m from TVI • Diffusers, shields, low-pressure sodium vapour lamps fitted to lights where appropriate (with due consideration for safety of personnel) • Lighting on vessels operating at night to be maintained at a minimum required to meet navigation and safety requirements
Solid and Liquid Wastes	• No uncontrolled release of waste into the environment • Offsite waste management facilities used have been SFU by Chevron ABU and licensed by DER	• Contamination of soil and groundwater from disposal of treated PFW to disposal wells and waterflood injection wells • Contamination of soil and groundwater from raw sewage release to terrestrial environment • Contamination of soil and groundwater from NORM release to terrestrial environment • Contamination of soil and groundwater from uncontrolled discharge of stormwater to terrestrial environment • Localised reduction in marine water quality from discharge of RO brine to marine and terrestrial environment • Contamination of soil and groundwater from hazardous wastes to terrestrial or marine environment during storage and transport (marine and terrestrial) • Localised reduction in marine water quality from domestic discharges (sewage, grey water) from vessels supporting offshore cessation activities	• All personnel have completed the ABU North West Core and Environment inductions and the TVI Site specific induction, which includes an overview waste management and housekeeping responsibilities • Cardboard, aluminium cans and glass is segregated on TVI in waste skips and sent to a Chevron SFU facility for recycling • Waste skips are covered to prevent windblown wastes being discharged to the environment • Putrescible wastes are placed into freezer containers and removed offsite for disposal • Garnet, controlled and industrial waste is segregated and classified prior to disposal off site by a licensed contractor and facility • Oil in water concentration of produced water does not exceed 200 ppm prior to being disposed of through the Produced Water Disposal Wells and Injection well • Onshore treated sewage wastewater is disposed through leach drains • Offshore discharge of grey water and treated sewage only when > 3 nm from land • Food wastes from offshore vessels are macerated to <25 mm and discharged > 3 nm from land • Oily water is contained on board and sent to shore for disposal at a Chevron SFU facility, or is discharged to the marine environment at a concentration < 15 ppm

Environmental Aspect	Objectives	Potential Impacts	Safeguards
Air Quality and Emissions	• Minimise impact to air quality. • Minimise impact from dust generation.	• Increased greenhouse gas emissions through venting, purging, and combustion • Generation of dust through off-road vehicle use, maintenance, remediation and rehabilitation activities	• Vehicles undertaking work will be operated within Chevron lease area only, unless approval is granted by DPaW, and speed does not exceed 40 km/h • Regular maintenance is carried out on all powered plant and equipment to maintain optimal operating efficiency
Quarantine	• No introduction of invasive NIS to TVI from Chevron vessels, personnel, or freight • No introduction of marine pests to TVI surrounding waters from Chevron vessels • Control the potential spread of existing NIS (weed species only) from the nature reserve into the Chevron lease area	• Introduction of invasive terrestrial NIS via transit of freight or personnel • Spread of invasive terrestrial NIS (weeds) from intra-island vehicle, machinery and personnel movement • Introduction of invasive marine NIS through discharge of ballast water or hull fouling	• All personnel have completed the ABU North West Core and Environment inductions and the TVI Site specific induction, which includes an overview of quarantine requirements for TVI • Luggage, (carry on and hold), is X-rayed by the Aviation Service Provider for signs of vermin/seeds/weeds prior to departure at Perth airport • Quarantine inspection and control check are undertaken at supply bases prior to freight transport to TVI and cargo is inspected prior to unloading barges • Vessels have a current and certified antifouling coating • No discharge of ballast water < 12 nm from land or in water depths of < 200 m • House mouse detection devices and traps are being deployed • Weed spraying and/or removal is implemented
Socio-Economic – Cultural Heritage and Other Users	• No reported disruptions to other marine users operating within the water surrounding TVI attributed to TVI operations • No disturbance of heritage sites attributable to TVI operations at Tubridgi or outside of the Chevron lease	• Disruption to commercial fishing operations in the marine area surrounding TVI • Disturbance of heritage sites through ground disturbance activities at Tubridgi and outside the TVI Chevron lease boundary • Disruptions to commercial shipping operations in the marine area surrounding TVI	• Approval obtained for work conducted outside the Chevron lease area on TVI (within DPaW Nature Reserve)
Emergency Response - Wildfire and Cyclone	• No fires on TVI as a result of Chevron operations • No health, environmental or safety incidents on TVI as a result of a cyclone	• Asset and infrastructure loss from fire • Asset and infrastructure loss from cyclones • Habitat and vegetation loss/ fragmentation/ alteration as a result of fire • Impacts to fauna as a result of a fire event	• All personnel have completed the ABU North West Core and Environment inductions and the TVI Site specific induction, which outlines activities that are required to prevent fires and identifies designated smoking areas • Permits obtained for hot work activities • Fire drills have been conducted to ensure firefighting preparedness. • Firefighting equipment checked on a regular basis • Regular vehicle maintenance undertaken • Vegetation control implemented around flares • Following remobilisation after a cyclone, inspections undertaken to investigate and respond to any impacts including visual inspection of hydrocarbon pipeline for leaks before field start-up
Unplanned Spill Events and Spill Response	• No unplanned spill events to terrestrial environment • No unplanned spill events to marine environments • Minimise impact if spills reach marine environment or vegetated areas	• Reduction in groundwater quality resulting from loss of containment. • Reduction in soil quality resulting from loss of containment • Reduction in water quality resulting from a spill to the marine environment • Terrestrial flora and fauna mortality / disturbance • Marine flora and fauna mortality / disturbance • Terrestrial flora and fauna mortality / disturbance • Marine flora and fauna mortality / disturbance • Disturbance to native vegetation	• Hazardous materials stored within secondary containment • TVI facility and equipment inspections, corrosion prevention and cathodic protection measures are undertaken • Containment bunds and sumps on TVI and offshore platforms are inspected and, where required emptied, to maintain appropriate freeboard • Monthly inspections of offshore platforms • All emergency response personnel have undertaken appropriate training • Emergency response equipment (spill kits and/or clean-up equipment) is located at the diesel refuel bowser, the workshops, on the jetty and offshore platforms

Appendix 2 Chemical Disclosure and Material Safety Data Sheets

DMP CHEMICAL DISCLOSURE REPORTING

A. SYSTEM DETAILS:

OPERATOR:	**Chevron Australia Pty Ltd**
PROJECT / WELL:	**Thevenard Island Joint Venture Production Facility**
SYSTEM:	**Production – Downhole Disposal**
TOTAL VOLUME OF SYSTEM:	**319,100 ML**

B. PRODUCT LIST

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity details	MSDS attached
Water	Produced Water	Base Fluid	99.99938%	Produced formation water with oil-in-water concentration no greater than 200 ppm	N/A
CRW24133	Baker Hughes Australia Pty Ltd	Corrosion Inhibitor	0.000562 %	Acute toxicity (CRW24133): LD_{50} (oral): >5000 mg/kg (rat) Acute toxicity (Quaternary Ammonium Compounds, Benzyl-C12-18-Alkyldimethyl,Chlorides - 5% constituent): Fish LC_{50}(24hr): 5400 µg/L (*Poecilia reticulata*) Crustacean LC_{50}(24hr): 120 µg/L (*Daphnia magna*) Algae EC_{50}(96hr): 170 µg/L (*Chlorella pyrenoidosa*) Acute toxicity (Amines, N-tallow-alkyltrimethyl – 30% constituent): Crustacean EC_{50}(48hr): 1-10 mg/l (*Daphnia*) Chronic toxicity (CRW24133): Not carcinogenic in animal studies. Biodegradation / bioaccumulation (CRW24133): Expected to be inherently biodegradable and has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.	Y
CRW24830	Baker Hughes Australia Pty Ltd	Corrosion Inhibitor	0.0000038 %	Acute toxicity (CRW24830): Not available. Acute toxicity (2-(2-Butoxyethoxy)Ethanol - 30% constituent): Fish LC_{50}(24hr): 2700 mg/L (*Carassius auratus*) Fish LC_{50}(7 days): 1150 mg/L (*Poecilia reticulata*) Biodegradation / bioaccumulation (2-(2-Butoxyethoxy)Ethanol - 30% constituent): Biodegradation: 85% (28d) BOD-5: 250 mg/g Chemical Oxygen Demand: 2,080 mg/g Ecotoxicity (Ammonium Bisulphite – 30% constituent): Contains high levels of the ammonium ion which is harmful to aquatic life, particularly fish.	Y
Magnacide B	Baker Hughes Australia Pty Ltd	Biocide Microbiocide	0.0000097 %	Acute toxicity (Magnacide B): LD_{50} (oral): 29 mg/kg (rat) Fish LC_{50}(96hr): 24 ppb (*Lepomis macrochirus*) Crustacean LC_{50}(96hr): 500 ppb (*Mysidopsis bahia*) Algae EC_{50}(120hr): 27 ppb (*Skeletonema costatum*) Chronic toxicity (Magnacide B): A 12-month study on dogs indicated that the highest dose (2 mg/kg) resulted in changes in blood chemistry. No indications of cancer were found in the tests. Biodegradation / bioaccumulation (Magnacide B): Metabolism studies indicate not bioaccumulative in tissue (fish, shell fish, mammals, birds, lettuce). Biodegradation half-life (freshwater): 6-10 hrs. Biodegradation half-life (aerobic soil-water): 4.2 hrs.	Y
RBW24136	Baker Hughes Australia Pty Ltd	Water Clarifier	0.0000125 %	Acute toxicity (~~RBW24136~~Potassium Hydroxide – 5% constituent): LD_{50} (oral): 273 mg/kg (rat) Fish LC_{50}(96hr): 80 000 ug/L (*Gambusia affinis*)	Y

				Acute toxicity (Dithiocarbamate derivative - 30% constituent): Fish LC_{50}(96hr): 0.175 - 0.82 mg/L (*Lepomis macrochirus*) Classified in MSDS as non hazardous Chronic toxicity (RBW24136): Not carcinogenic in animal studies. Biodegradation / bioaccumulation (Dithiocarbamate derivative - 30% constituent): Chemical degradation will occur, with bioaccumulation unlikely to occur. It is non-persistent in soil with < 2 weeks persistence (terrestrial fate), with the aquatic fate unlikely to adsorb to suspended solids or sediment.	
XC24117	Baker Hughes Australia Pty Ltd	Biocide	0.0000278 %	Acute toxicity (Glutaraldehyde - 30% constituent): Fish LC_{50}(24hr): 17 mg/l (*Salmo gairdneri*) Crustacean LC_{50}(48hr): 16.3 mg/l (*Daphnia magna*) Algae EC_{50}(96hr): 0.31 mg/l (*Selenastrum capricornutum*) Chronic toxicity (XC24117): Not carcinogenic in animal studies. Biodegradation / bioaccumulation (XC24117): Low bioaccumulation and biodegradation expected. Biodegradation / bioaccumulation (Glutaraldehyde - 30% constituent): Biodegradation: 80% (15d) Chemical Oxygen Demand: 1.88mg 0_2/mg (measured)	Y
XC24380	Baker Hughes Australia Pty Ltd	Biocide	0.0000025 %	Acute toxicity (CRW24380): LD_{50} (oral): 248 mg/kg (rat) Fish LC_{50}(96hr): 93 mg/l Crustacean EC_{50}(48hr): 19.4 mg/l (*Daphnia*) Algae EC_{50}(96hr): 0.2 mg/l Chronic toxicity (CRW24380): Not carcinogenic in animal studies. Biodegradation / bioaccumulation (CRW24380): Readily biodegradable. Biodegradation / bioaccumulation (Tetrakis (Hydroxymethyl) Phosphonium sulphate - 60% constituent): Bioaccumulation is expected to be low. High soil mobility (terrestrial fate), with the aquatic fate not expected to absorb to suspended solids and sediment.	Y

C. CHEMICAL LIST

Chemicals within products in Part B Downhole	CAS number	Mass fraction (%)
Water (Produced)	7732-18-5	99.99938
Water (in chemicals)	7732-18-5	0.000340
Amines, N-Tallow Alkyltrimethylenedi-, Ethoxylated	61790-85-0	0.000083
Sodium Thiosulphate	10102-17-7	0.000041
Tall Oil	8002-26-4	0.000033
Ethanediol	107-21-1	0.000031
2-(2-Butoxyethoxy)Ethanol	112-34-5	0.000031
Quaternary Ammonium Compounds, Benzyl-C12-18-Alkyldimethyl,Chlorides	68391-01-5	0.000024
Isopropanol	67-63-0	0.000015
Acrolein	107-02-8	0.000009
Glutaraldehyde	111-30-8	0.000005
Dithiocarbamate	204079-86-7	0.000003
Tetrakis(Hydroxymethyl)Phosphonium Sulphate	55666-30-8	0.000002
C12-16 Alkylbenzyldimethylammonium Chloride	68424-85-1	0.000001
Ammonium Bisulphite	10192-30-0	0.000001
Potassium Hydroxide	1310-58-3	0.000000
Methanol	67-56-1	0.000000
Propionaldehyde	123-38-6	0.000000
Hydroquinone	123-31-9	0.000000
Acetone	67-64-1	0.000000
Fluorescein Sodium Salt	518-47-8	0.000000
2-Propenal	100-73-2	0.000000
Benzene	71-43-2	0.000000
Acetaldehyde	75-07-0	0.000000
Total		**~100%**

DMP CHEMICAL DISCLOSURE REPORTING

A. SYSTEM DETAILS:

OPERATOR:	**Chevron Australia Pty Ltd**
PROJECT / WELL:	**Thevenard Island Joint Venture Production Facility**
SYSTEM:	**Cessation Cleaning and Flushing Activities**
TOTAL VOLUME OF SYSTEM:	**142,500 L**

B. PRODUCT LIST

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & ecotoxicity details	MSDS attached
SureClean(TM) 4231A	Baker Hughes Australia Pty Ltd	Cleaner	Maximum 10 %	Acute toxicity (d-Limonene - 60% constituent): Fish LC_{50}(96hr):0.702 mg/l (*Pimephales Promelas*) Crustacean LC_{50}(48hr): 0.577 mg/l (*Daphnia magna*) Chronic toxicity (d-Limonene - 60% constituent): Carcinogenic in male rats (renal tubular tumour). Biodegradation / bioaccumulation (d-Limonene - 60% constituent): Biodegradable under both aerobic and anaerobic conditions and bioaccumulation is low. The terrestrial fate is low to very low mobility in soil, with the aquatic fate expected to evaporate to a significant extent resulting from its high volatility.	Y
Surfsweep(TM) CLW3060	Baker Hughes Australia Pty Ltd	Cleaner	Maximum 1%	Acute toxicity (Oxyalkylated alkylphenol – <30% constituent): Crustaceans LC_{50} (10-12 days): 2.8-3.3 mg/l (*Calanoid copepod*) Acute toxicity (methanol - <30% constituent): Crustaceans LC_{50}: 2 500 000 ug/l (*Crangon crangon*) Chronic toxicity (methanol - <30% constituent): Methanol can have cumulative toxicity with repeated exposures. Has caused birth defects in rats exposed by the oral and inhalation routes. Chronic toxicity (inorganic phosphates - <5% constituent): Rats that were given high doses for 13 weeks had changes in body weight, food consumption, organ weights, and clinical parameters. Chronic toxicity (Alkyl benzenesulfonic acid- <5% constituent): Chronic inhalation causes swelling of the lungs, bronchial emphysema, and dental erosion. Biodegradation / bioaccumulation (methanol - <30% constituent): Biodegrades easily in water.	Y
Water	Freshwater	Base Fluid	89 %	N/A	N/A

C. CHEMICAL LIST

Chemicals within products in Part B Downhole	CAS number	Mass fraction (%)
Water	7732-18-5	94.33
d-Limonene	5989-27-5	2.84
Isopropylamine Alkylbenzene Sulphonate	68584-24-7	1.5
Propanol	34590-94-8	0.67
2-(2-Butoxyethoxy) Ethanol	112-34-5	0.22
Nonyl Phenol Ethoxylate	9016-45-9	0.13
Methanol	67-56-1	0.12
Diethyl Phthalate	84-66-2	0.07
Tetrapotassium Pyrophosphate	7320-34-5	0.04
Dodecyl Benzene Sulphonic Acid, Linear	68584-22-5	0.02
Benzyl Alcohol	100-51-6	0.01
L-Methanol	2216-51-5	0.007
Orange Peel Oil	8028-48-6	0.007
Coumarin	91-64-5	0.007
Galaxolide	122-05-5	0.0015
Dodecanenitrile	2437-25-4	0.0015
3, 7-Dimethylocta-2, 6-Dienenitrile	5146-66-7	0.0015
Terpenes and Turpenoids, Lemon Oil	68917-33-9	0.0015
Benxenem C10-16-Alkyl Derivatives	68648-87-3	0.0004
Sulphuric Acid	7664-93-9	0.0002
Sulphur Dioxide	7446-09-5	0.0002
Total		**~100%**

Material Safety Data Sheet

1 . Product and company identification

Product name : SurfSweep™ CLW3060 Pipeline Cleaner
™ a trademark of Baker Hughes, Inc.

Supplier : Baker Petrolite
A Baker Hughes Company
12645 W. Airport Blvd.
Sugar Land, TX 77478
For Product Information/MSDSs Call: 800-231-3606
(8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400

Material Uses : Special: Pipeline Cleaner.

Code : CLW3060

Validation date : 10/10/2012.

Print date : 10/10/2012.

Version : 5.01

Responsible name : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

In case of emergency : CHEMTREC: 800-424-9300 (U.S. 24 hour)
Baker Petrolite: 800-231-3606
(001)281-276-5400
CANUTEC: 613-996-6666 (Canada 24 hours)
CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

2 . Hazards identification

Physical state : Liquid. [Clear.]

Odor : Alcohol-like.

Color : Yellow. [Light]

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!

FLAMMABLE LIQUID AND VAPOR. INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. MAY CAUSE BLINDNESS IF SWALLOWED. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Keep away from heat, sparks and flame. Do not breathe vapor or mist. Do not ingest. Do not get in eyes. Avoid contact with skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. Vapors may form explosive mixtures with air. Vapors can travel to a source of ignition and flashback. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

Routes of entry : Dermal contact. Eye contact. Inhalation.

Potential acute health effects

Inhalation : Can cause central nervous system (CNS) depression. Irritating to respiratory system.

Ingestion : Harmful if swallowed. Can cause central nervous system (CNS) depression. May cause blindness if swallowed.

Skin : Harmful in contact with skin. Irritating to skin.

Eyes : Severely irritating to eyes. Risk of serious damage to eyes.

2 . Hazards identification

Potential chronic health effects

Chronic effects : Contains material that may cause target organ damage, based on animal data. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Target organs : Contains material which may cause damage to the following organs: the nervous system, bladder, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Over-exposure signs/symptoms

Inhalation : respiratory tract irritation, nausea or vomiting, coughing, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness

Ingestion : None known.

Skin : irritation, redness, dryness, cracking

Eyes : pain or irritation, watering, redness

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS number	%
Oxyalkylated alkylphenol	Trade secret.	10 - 30
Methanol	67-56-1	10 - 30
Inorganic phosphates	Trade secret.	1 - 5
Alkyl benzenesulfonic acid	Trade secret.	1 - 5

4 . First aid measures

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

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. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

5 . Fire-fighting measures

Flammability of the product : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

5 . Fire-fighting measures

Not suitable : Do not use water jet.

Special exposure hazards : 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.

Hazardous thermal decomposition products : carbon dioxide,carbon monoxide,sulfur oxides,phosphorus oxides,metal oxide/oxides

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.

6 . Accidental release measures

Personal precautions : 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. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) 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). Use spark-proof tools and explosion-proof equipment. 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.

If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). 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. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. 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 non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). 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 unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredients:	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Methanol	US ACGIH OSHA PEL OSHA PEL 1989	200 200 200	262 260 260	- - -	250 - 250	328 - 325	- - -	- - -	- - -	- - -	[1] [1]

[1]Absorbed through skin.

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : 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. Use explosion-proof ventilation equipment.

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. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

Personal protection

Respiratory : If a risk assessment indicates it is necessary, use a properly fitted supplied air respirator complying with an approved standard. 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.

Hands : Chemical-resistant gloves: Nitrile or Neoprene gloves. 4H gloves.

Eyes : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

Skin : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

9 . Physical and chemical properties

Physical state : Liquid. [Clear.]

Flash point : Closed cup: 33.3°C (91.9°F) [PMCC]

Auto-ignition temperature : Not available.

Flammable limits : Not available.

Color : Yellow. [Light]

Odor : Alcohol-like.

pH : 8 to 9

: Neat - without dilution

Boiling/condensation point : Not available.

Initial Boiling Point : Not available.

Melting/freezing point : Not available.

Relative density : 1.032 (15.6°C)

Density : 8.6 (lbs/gal)

Vapor density : >1 [Air = 1]

Odor threshold : Not available.

Evaporation rate : Not available.

9 . Physical and chemical properties

VOC : Not available.

Viscosity : Dynamic (25°C): 20 cP

Solubility (Water) : Soluble

Vapor pressure : 4 kPa (30 mm Hg) at 21.1°C (Calculated Value for all Components.)

Pour Point : -26.1°C (-15°F)

Partition coefficient (LogKow) : Not available.

10 . Stability and Reactivity

Chemical stability : The product is stable.

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

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Materials to avoid : Reactive or incompatible with the following materials: oxidizing materials, reducing materials and acids.
Methanol is incompatible and may react with acetyl bromide, alkyl aluminum solutions, beryllium hydride, boron trichloride, nitric acid, cyanuric chloride, dichloromethane, diethylzinc, metals (granulated forms of aluminum and magnesium – including aluminum and zinc salts), phosphorus III oxide, and potassium tert-butoxide.

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

Conditions of reactivity : Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Oxyalkylated alkylphenol	LD50 Dermal	Rabbit	1800 to 2300 mg/kg	-
	LD50 Oral	Rat	960 mg/kg	-
Methanol	LD50 Dermal	Rabbit	15800 mg/kg	-
	LD50 Oral	Rabbit	14200 mg/kg	-
	LD50 Oral	Rat	5600 mg/kg	-
	LC50 Inhalation Gas.	Rat	145000 ppm	1 hours
	LC50 Inhalation Gas.	Rat	64000 ppm	4 hours
	LC50 Inhalation Vapor	Mouse	50000 ppm	4 hours
Inorganic phosphates	LD50 Dermal	Rabbit	>4640 mg/kg	-
Alkyl benzenesulfonic acid	LD50 Dermal	Rabbit	2000 mg/kg	-
	LD50 Oral	Rat	1470 mg/kg	-
	LD50 Oral	Rat	775 mg/kg	-

Chronic toxicity Remarks

11 . Toxicological information

1) Oxyalkylated alkylphenol

Not available.

2) Methanol

Methanol is a component of this product. Because methanol is eliminated from the body more slowly than ethanol, it can have cumulative toxicity with repeated exposures (ACGIH, 1992).

Acute dermal, oral, and inhalation exposure to methanol can cause Central Nervous System effects, optic nerve effects, diminished vision, and brain effects (necrosis and hemorrhaging). (Bennett, I.L. et al, 1953)

Ingestion of methanol can cause Central Nervous System depression, metabolic acidosis, blurred vision and blindness, gastrointestinal effects, and coma and death. (Clayton, G.D. and Clayton, F.E., 1982, Patty's Industrial Hygiene and Toxicology, Vol2C) Dermal exposure to methanol can cause Central Nervous System depression, blurred vision, and gastrointestinal effects. (Downie, A et al, 1992, Occupational Medicine, 42, pp 47-9) Chronic inhalation of methanol can cause Central Nervous System depression, blurred vision, and gastrointestinal effects. (Frederick, L.J. et al, 1984, AIHA Journal, 45, pp 51-5) Chronic inhalation of methanol has caused liver effects in laboratory animals. (Poon, R et al, 1994, Toxocology and Industrial Health 10: 231-245) Chronic oral exposure has caused Central Nervous System effects and eye effects in laboratory animals. [Youssef, A. F. et al (1993) Neurotoxicology and Teratology 15: 223-227; Baumbach, G.L. et al (1977) Archives of Ophthalmology 95: 1859-1865; Hayreh, M.S. et al (1977) Archives of Ophthalmology 95: 1851-1858; Hayreh, M.S. et al (1980) Ocular toxicity of methanol: An experimental study – Raven Press, New York, pages 35-53; and Martin-Amat, G. et al (1977) Archives of Ophthalmology 95: 1847-1850]

Methanol has produced in vivo mutagenicity in animal studies. (Pereira, M.A. et al, 1982) and (Ward, J. B. et al, 1983)

Methanol was mutagenic in yeast (RTECS). Methanol has caused chromosome aberrations in yeast (RTECS) and grasshoppers (Saha & Khudabaksh, 1974).

Methanol has caused birth defects in rats exposed by the oral (Infurna et al, 1981) and inhalation (Nelson et al, 1984; Nelson et al, 1985) routes. Exencephaly (a defect in the skull bone structure that leaves the brain exposed) and cleft palate (a fissure or unformed bone structure in the roof of the mouth (palate), lip, or facial area, occurring during the embryonic stage of development) were increased in fetal mice exposed to methanol at an airborne concentration of 5,000 ppm or higher for 7 hours/day on days 6 to 15 of gestation.

Embryotoxicity and fetotoxicity were seen with maternal exposure to airborne concentrations of 7,500 ppm and above, and reduced fetal weights with concentrations of 10,000 ppm or greater. The NOAEL was 1,000 ppm. Effects similar to those seen in the 10,000 ppm dosage group were also seen in offspring of mice given a dose of 4 g/kg orally (Rogers et al, 1993).

3) Inorganic phosphates

Rats that were given high doses for 13 weeks had changes in body weight, food consumption, organ weights, and clinical parameters.

4) Alkyl benzenesulfonic acid

Alkylbenzene sulfonic acid is a component of this product. Chronic inhalation causes swelling of the lungs, bronchial emphysema, and dental erosion (MSDS).

Additional information

This product was non-corrosive when evaluated using the Corrositex test system.

12 . Ecological information

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Oxyalkylated alkylphenol	Acute LC50 2.8 to 3.3 mg/L Marine water	Crustaceans - Calanoid copepod - Acartia tonsa - Adult - 10 to 12 days	48 hours
	Acute LC50 4800 ug/L Fresh water	Daphnia - Water flea - Daphnia pulex - LARVAE	48 hours
	Acute LC50 1300 to 1800 ug/L Fresh water	Fish - Bluegill - Lepomis macrochirus - 1 g	96 hours
Methanol	Acute LC50 2500000 ug/L Marine water	Crustaceans - Common shrimp, sand shrimp - Crangon crangon - Adult	48 hours
	Acute LC50 3289 to 4395 mg/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <24 hours	48 hours
	Acute LC50 >100000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling) - 0.2 to 0.5 g	96 hours
Alkyl benzenesulfonic acid	Acute EC50 5.65 mg/L Fresh water	Daphnia - Water flea - Ceriodaphnia dubia - Neonate - <24 hours	48 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Additional information

An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	UN1993	FLAMMABLE LIQUIDS, N.O.S. (Contains: Methanol)	3	III		-
TDG Classification	UN1993	FLAMMABLE LIQUID, N.O.S. (Contains: Methanol)	3	III		-

14 . Transport information

IMDG Class	UN1993	FLAMMABLE LIQUID, N.O.S. (Contains: Methanol)	3	III		**Emergency schedules (EmS)** F-E S-D
IATA-DGR Class	UN1993	FLAMMABLE LIQUID, N.O.S (Contains: Methanol)	3	III		-

PG* : Packing group

DOT Reportable Quantity Methanol, 3567 gal of this product.

Marine pollutant Not applicable.

North-America NAERG : 128

15 . Regulatory information

HCS Classification : Flammable liquid
Irritating material
Target organ effects

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Methanol
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: SurfSweep™ CLW3060 Pipeline Cleaner: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

CERCLA: Hazardous substances.: methanol: 5000 lbs. (2270 kg)

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: sulphuric acid

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :

Listed

SARA 313

	Product name	CAS number	Concentration
Supplier notification :	Methanol	67-56-1	10 - 30

United States inventory (TSCA 8b) : All components are listed or exempted.

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

Canada (CEPA DSL): : All components are listed or exempted.

16 . Other information

Label requirements : FLAMMABLE LIQUID AND VAPOR. INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. MAY CAUSE BLINDNESS IF SWALLOWED. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

National Fire Protection Association (U.S.A.) :

Date of printing : **10/10/2012.**

Indicates information that has changed from previously issued version.

Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Material Safety Data Sheet

XC24380

1 . Identification of the material and supplier

Names

Product name : XC24380

Product code : XC24380

ADG : Toxic liquid, organic, n.o.s. (tetrakishydroxymethylphosphonium sulphate)

Supplier : 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)

Uses

Material uses : Biocide

2 . Hazards identification

Classification : Repr. Cat. 2; R61
T; R23
Xn; R22
Xi; R41
R43
N; R50

Risk phrases : R61- May cause harm to the unborn child.
R23- Also toxic by inhalation.
R22- Also harmful if swallowed.
R41- Risk of serious damage to eyes.
R43- May cause sensitisation by skin contact.
R50- Very toxic to aquatic organisms.

Safety phrases : S53- Avoid exposure - obtain special instructions before use.
S24- Avoid contact with skin.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

Statement of hazardous/dangerous nature : HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	55566-30-8	60 - 100

Other ingredients, determined not to be hazardous according to Safe Work Australia criteria, and not dangerous according to the ADG Code, make up the product concentration to 100%.

3 . Composition/information on ingredients

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.

4 . First-aid measures

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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Obtain immediate medical attention after the following First Aid measures have been administered. 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. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Obtain immediate medical attention after the following First Aid measures have been administered. 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.

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.

Advice to doctor : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

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

Not suitable : None known.

Special exposure hazards : 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. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

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

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.

Hazchem code : 2X

6 . Accidental release measures

Personal precautions : 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 (see Section 8).

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.

Small spill : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.

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

Storage : 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

Occupational exposure limits

Ingredient name	Exposure limits
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	**ACGIH TLV (United States, 1/2011). Skin sensitiser.** TWA: 2 mg/m³ 8 hour(s).

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : 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.

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eyes : 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 or dusts.

Hands : 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.

Respiratory : 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.

Skin : 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.

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.

9 . Physical and chemical properties

Physical state : Liquid.
Colour : Colourless.
Odour : Pungent.
Melting point : -43°C (-45.4°F)
Relative density : 1.39 (20°C)
pH : 3 to 6
Viscosity : Kinematic: 0.3 cm^2/s (30 cSt)
Solubility : Soluble in water

10 . Stability and reactivity

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 exposure - obtain special instructions before use. Avoid release to the environment. Refer to special instructions/safety data sheet.
Materials to avoid : No specific data.
Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

Inhalation : Toxic by inhalation.
Ingestion : Harmful if swallowed.
Skin contact : May cause sensitisation by skin contact.
Eye contact : Severely irritating to eyes. Risk of serious damage to eyes.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	LC50 Inhalation Dusts and mists	Rat	0.591 mg/l	4 hours
	LD50 Oral	Rat	248 mg/kg	-

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Product name	Carcinogenic effects	Mutagenic effects	Developmental effects	Fertility effects
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	-	-	Repr. Cat. 2; R61	-

11 . Toxicological information

Chronic effects : 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 : May cause birth defects.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Inhalation : No specific data.

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

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

Target organs : Contains material which may cause damage to the following organs: skin.

12 . Ecological information

Ecotoxicity : Very toxic to aquatic organisms.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	Acute EC50 0.2 mg/l	Algae	96 hours
	Acute EC50 19.4 mg/l	Daphnia	48 hours
	Acute LC50 93 mg/l	Fish	96 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	-	70 % - Readily - 21 days	-	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	-	-	Readily

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

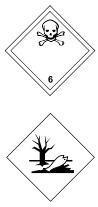
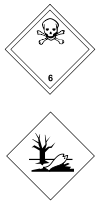
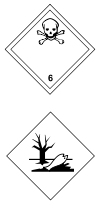
13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

Regulation	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADG	UN2810	Toxic liquid, organic, n.o.s. (tetrakishydroxymethylphosphonium sulphate)	6.1	III		**Hazchem code** 2X

14 . Transport information

ADR	UN2810	Toxic liquid, organic, n.o.s. (tetrakishydroxymethylphosphonium sulphate)	6.1	III		**UK Hazchem:** 2X
IMDG	UN2810	Toxic liquid, organic, n.o.s. (tetrakishydroxymethylphosphonium sulphate)	6.1	III		-
IATA	UN2810	Toxic liquid, organic, n.o.s. (tetrakishydroxymethylphosphonium sulphate)	6.1	III		-

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

Not regulated.

Control of Scheduled Carcinogenic Substances

Ingredient name	Schedule
No listed substance	

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

EU Classification :
Repr. Cat. 2; R61
T; R23
Xn; R22
Xi; R41
R43
N; R50

Risk phrases :
R61- May cause harm to the unborn child.
R23- Also toxic by inhalation.
R22- Also harmful if swallowed.
R41- Risk of serious damage to eyes.
R43- May cause sensitisation by skin contact.
R50- Very toxic to aquatic organisms.

Safety phrases :
S53- Avoid exposure - obtain special instructions before use.
S24- Avoid contact with skin.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

National regulations : **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.**

16 . Other information

Date of printing	:	25 February 2013.
Date of issue/ Date of revision	:	25 February 2013
Date of previous issue	:	12 April 2012
Version	:	2

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.

Baker Petrolite

SAFETY DATA SHEET

XC24117

1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME XC24117

PRODUCT NO. XC24117

APPLICATION Biocide

SUPPLIER

Baker Petrolite, Australia
5 Walker Street
Braeside
Vic. 3195
Australia
Tel: +613 9580 9004
Fax: +613 9580 6004

EMERGENCY TELEPHONE CHEMTREC Emergency telephone number within Australia (02) 8014 4880
CHEMTREC Emergency telephone number outside Australia +61 2801 44880

2 HAZARDS IDENTIFICATION

HAZARD ID

Causes burns. Harmful by inhalation and if swallowed. Irritating to respiratory system. May cause sensitisation by inhalation and skin contact.

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE (According to criteria of ASCC). DANGEROUS GOODS (According to ADG Code).

SAFETY PHRASES

Do not breathe vapour/spray. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of insufficient ventilation, wear suitable respiratory equipment. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).

DG CLASS

Class 8: Corrosive substances.

PACKING GROUP II

UN NO. 3265

HAZCHEM CODE 2X

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
GLUTARALDEHYDE	203-856-5	111-30-8	10-30%	T;R23/25. C;R34. N;R50. R42/43.
METHANOL	200-659-6	67-56-1	<1%	F;R11 T;R23/24/25,R39/23/24/25
QUATERNARY AMMONIUM CHLORIDE	205-352-0	139-08-2	1-5%	C;R34 Xn;R21/22 N;R50

4 FIRST-AID MEASURES

NOTES TO THE PHYSICIAN

The hazards of this material are due mainly to its severely irritant properties on skin and mucosal surfaces. Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with haemorrhage and fluid loss. Also, perforation of the oesophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. Any material aspirated during vomiting may cause lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (e.g., gastric lavage after endotrachei intubation).

INHALATION

Remove victim immediately from source of exposure. Provide rest, warmth and fresh air. Perform artificial respiration if breathing has stopped. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention.

INGESTION

DO NOT induce vomiting. Get medical attention immediately. Do not give anything to drink.

SKIN CONTACT

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention immediately. Do NOT take contaminated clothing home to be laundered. Discard contaminated clothing as well as shoes, belts, and other articles made of leather.

EYE CONTACT

Immediately flush eyes with water and continue washing for at least 15 minutes. DO NOT remove contact lenses, if worn. Obtain medical attention without delay, preferably from an ophthalmologist.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.

SPECIAL FIRE FIGHTING PROCEDURES

Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and public water ways.

PROTECTIVE MEASURES IN FIRE

Do not enter fire area without proper personal protective equipment, including AS/NZS-1716 approved self-contained breathing apparatus.

HAZCHEM CODE 2X

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear suitable protective clothing, gloves and safety goggles.

ENVIRONMENTAL PRECAUTIONS

Dike to prevent entering any sewer or waterway.

SPILL CLEAN UP METHODS

Very low concentrations (5 ppm or less of glutaraldehyde) can be degraded in a wastewater biological treatment system, therefore small spills can be flushed with large quantities of water. Large quantities or 'slugs' can be harmful to the treatment system, therefore large spills should be collected for disposal. It may also be possible to decontaminate spilled material by careful application of aqueous sodium hydroxide or sodium bisulphite. Depending on conditions, considerable heat and fumes can be liberated by the decontamination reaction.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Wear appropriate personal protective equipment. Avoid contact with eyes, skin and clothing. Avoid breathing vapours or spray mists. Use only with adequate ventilation. Store in a secure and well ventilated area. Keep away from heat, sparks and flame. Keep away from incompatible materials. Keep container tightly closed when not in use.

STORAGE PRECAUTIONS

Comply with the requirements of NOHSC:1015 (2001) - Storage and Handling of Workplace Dangerous Goods.

STORAGE CLASS

Corrosive storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	Std	LT - ppm		ST - ppm		Notes
GLUTARALDEHYDE	WEL	0.05 ppm Sen	0.2 mg/m3(Sen)	0.05 ppm Sen	0.2 mg/m3(Sen)	

WEL = Workplace Exposure Limit.

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours or mists below their respective threshold limit value. Ensure that adequate wash water, such as eyewash stations and safety showers, are proximal to the work location.

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Use AS/NZS-1716 approved respirator. Chemical respirator with organic vapour cartridge and full facepiece. For emergency situations where the exposure standard may be exceeded, use an approved positive-pressure self-contained breathing apparatus with full facepiece or positive-pressure airline with auxiliary self-contained air supply.

HAND PROTECTION

Nitrile gloves are recommended. Butyl rubber gloves are recommended.

EYE PROTECTION

Use safety goggles and face shield in case of splash risk. Use full face shield if splashes could occur.

OTHER PROTECTION

Wear rubber footwear. Wear long sleeves to prevent repeated or prolonged skin contact.

HYGIENE MEASURES

Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated.

PERSONAL PROTECTION

Personal protective equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended to determine the level of personal protective equipment appropriate for specific job tasks and conditions.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid
COLOUR	Clear Colourless
ODOUR	Sharp fruity. Medicinal.
SOLUBILITY	Completely soluble in water
BOILING POINT (°C)	Approx. 100°C @ 760 mm Hg
RELATIVE DENSITY	Typically 1.043 @ 20°C
pH-VALUE, DILUTED SOLUTION	Typically 4.0 - 6.0 (10% solution)

10 STABILITY AND REACTIVITY

STABILITY

No particular stability concerns.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong alkalies and acids catalyze an aldol-type condensation (exothermic, but not expected to be violent.)

11 TOXICOLOGICAL INFORMATION

GENERAL INFORMATION

Studies in humans have shown that glutaraldehyde is neither phototoxic nor a photosensitizer. Subchronic drinking water studies in rats, mice and dogs using concentrations up to 1000 ppm showed no evidence for any target organ toxicity. In vitro studies for genotoxicity using a variety of assays have given results varying from no activity, though equivocal, to weakly positive; however, all in vivo studies for genotoxicity have been uniformly negative. Several developmental toxicity studies have demonstrated that at maternally nontoxic doses, glutaraldehyde does not produce fetotoxic, embryotoxic-or teratogenic effects. In a two-generation reproduction study involving continuous exposure of CD rats to glutaraldehyde up to 1000 ppm, in drinking water there were effects on parental body weight and food consumption at 1000 ppm (due to an aversion to the taste), but no adverse effects on reproductive performance. In a chronic (2-year) continuous drinking water combined chronic toxicity-oncogenicity study using Fischer 344 rats, there was no evidence for non-oncogenic target organ toxicity. The only possible oncogenicity-related finding was an increase in the incidence of large granular cell lymphocytic leukemia in female, but not male, rats. The pattern of the response suggests that it does not represent direct chemical carcinogenic activity but, rather, a modifying influence on the expression of this spontaneous and commonly occurring neoplasm in the Fischer 344 rat. Repeated applications of aqueous solutions of glutaraldehyde to the rat skin for 20 dosages over a 28-day period at 50, 100 or 150 mg/kg/day produced mild local inflammatory effects, but no evidence for target organ or tissue system toxicity. Under the auspices of the National Toxicological Program a chronic study with glutaraldehyde vapour was conducted in rats (0, 250, 500 and 750 ppb) and mice (0, 62.5, 125 and 250 ppb). Animals were exposed for 6 hr/day, 5 days/week for 104 weeks. Under these conditions there were no significant increases in any tumor types, and glutaraldehyde was not carcinogenic. An extensive clinical survey has been conducted on nursing staff in 59 endoscopy units (340 currently employed workers and 18 former employees); investigational procedures included detailed questionnaire, sensitization to common allergens, blood for IgE measurements, lung function tests, peak flow diaries, and measurement of workplace glutaraldehyde vapor concentrations. About two-thirds of current employees had ocular, nasal, or lower respiratory tract symptoms, but these were more prevalent for non-work conditions. The only effect correlated with glutaraldehyde exposure was nasal irritation. This was a slight, but not statistically or biologically significant, decrease in FEVI for those with lower respiratory tract symptoms. There were no indications of asthma and no objective evidence for respiratory sensitization.

INHALATION

Vapour is irritating to the respiratory tract, causing stinging sensations in the nose and throat, discharge from the nose, possibly bleeding from the nose coughing, chest discomfort and tightness, difficulty with breathing, and headache. Heating the solution may result in more severe irritant effects.

INGESTION

May result in irritation or burns to the mouth and digestive tract... There will be discomfort or pain in the chest and abdomen, nausea, vomiting, diarrhoea, dizziness, faintness, drowsiness, thirst, weakness, circulatory shock, collapse and coma. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.

SKIN CONTACT

Brief contact will cause itching with mild to moderate local redness and possibly swelling. Prolonged contact may result in pain, severe redness and swelling, with ulceration, tissue destruction, and possibly bleeding into the inflamed area. Contact with solutions of glutaraldehyde may cause a harmless yellow or brownish discolouration of the skin.

EYE CONTACT

Liquid will cause a severe and persistent conjunctivitis, seen as excess redness and marked swelling of the conjunctiva with profuse discharge. Severe corneal injury may develop, which could permanently impair vision if prompt first-aid and medical treatment are not obtained. Vapour will cause stinging sensations in the eye with excess tear production, blinking, and possibly a slight excess redness of the conjunctiva.

MEDICAL SYMPTOMS

Effects of Repeated Over-exposure: Repeated skin contact may cause a cumulative dermatitis. Medical Conditions Aggravated by Over-exposure: Skin contact may aggravate an existing dermatitis. Inhalation of material may aggravate asthma and inflammatory or fibrotic pulmonary disease. Other Effects of Over-exposure: May cause skin sensitization in a small portion of individuals and present as an allergic contact dermatitis. This usually results from contact with the liquid, but occasionally there may be a reaction to glutaraldehyde vapour. May cause asthma, particularly in those with an increased tendency to develop allergic reactions to common environmental allergens (i.e., atopic individuals).

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Please contact Baker Petrolite for further information.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable state and local regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change. The preferred method of disposal is to atomise into a very hot incinerator fire or mix with a suitable flammable solvent, and incinerate where permitted under appropriate national and local regulations. High water content may dampen flame.

14 TRANSPORT INFORMATION

PROPER SHIPPING NAME	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Contains Glutaraldehyde)
UN NO.	3265
DG CLASS	Class 8: Corrosive substances.
PACKING GROUP	II
UN NO. SEA	3265
IMDG CLASS	8
IMDG PACK GR.	II
MARINE POLLUTANT	Marine Pollutant

UN NO. AIR	3265
AIR CLASS	8
AIR PACK GR.	II
HAZCHEM CODE	2X

15 REGULATORY INFORMATION

LABELLING

Corrosive

Harmful

CONTAINS GLUTARALDEHYDE

RISK PHRASES

R34	Causes burns.
R20/22	Harmful by inhalation and if swallowed.
R37	Irritating to respiratory system.
R42/43	May cause sensitisation by inhalation and skin contact.

SAFETY PHRASES

S23	Do not breathe vapour/spray.
S25	Avoid contact with eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S38	In case of insufficient ventilation, wear suitable respiratory equipment.

	S45	In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).

POISONS SCHEDULE NUMBER S6

NATIONAL REGULATIONS AND REFERENCES

National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. National Code of Practice for the Storage and Handling of Workplace Dangerous Goods. Approved Criteria for Classifying Hazardous Substances.

16 OTHER INFORMATION

GENERAL INFORMATION

The information in the MSDS is based on data which is considered to be accurate. Baker Petrolite, however, makes no guarantees or warranty, either expressed or implied on the accuracy or completeness of this information. The conditions of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product. This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

REVISION COMMENTS

Revision has taken place in section 2, 15, and 16

REVISION DATE 02/10/2008

REV. NO./REPL. SDS GENERATED 1

RISK PHRASES IN FULL

R11	Highly flammable.
R21/22	Harmful in contact with skin and if swallowed.
R23/24/25	Toxic by inhalation, in contact with skin and if swallowed.
R23/25	Toxic by inhalation and if swallowed.
R34	Causes burns.
R39/23/24/25	Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R42/43	May cause sensitisation by inhalation and skin contact.
R50	Very toxic to aquatic organisms.

Baker Petrolite

SAFETY DATA SHEET

SureClean(TM) 4231A

1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME SureClean(TM) 4231A

PRODUCT NO. SRC4231A

APPLICATION Cleaner

SUPPLIER

Baker Petrolite, Australia
5 Walker Street
Braeside
Vic. 3195
Australia
Tel: +613 9580 9004
Fax: +613 9580 6004

EMERGENCY TELEPHONE

CHEMTREC Emergency telephone number within Australia (02) 8014 4880
CHEMTREC Emergency telephone number outside Australia +61 2801 44880

2 HAZARDS IDENTIFICATION

HAZARD ID

Flammable. Irritating to eyes and skin. May cause sensitisation by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE (According to criteria of ASCC). DANGEROUS GOODS (According to ADG Code).

SAFETY PHRASES

Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable gloves. Use appropriate containment to avoid environmental contamination. Avoid release to the environment. Refer to special instructions/safety data sheets.

DG CLASS

Class 3: Flammable liquids.

PACKING GROUP III

UN NO. 1993

HAZCHEM CODE 3[Y]

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
2-(2-BUTOXYETHOXY)ETHANOL	203-961-6	112-34-5	1-5%	Xi;R36
d-LIMONENE	227-813-5	5989-27-5	30-60%	R10 R43 Xi;R38 N;R50/53
ISOPROPYLAMINE ALKYLBENZENE SULPHONATE	271-531-5	68584-24-7	10-30%	Xi;R36/38.

4 FIRST-AID MEASURES

INHALATION

Remove victim immediately from source of exposure. Provide rest, warmth and fresh air. Get medical attention if any discomfort continues. If respiratory problems, artificial respiration/oxygen.

INGESTION

DO NOT INDUCE VOMITING! Rinse mouth thoroughly. Drink plenty of water. Get medical attention immediately! NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS!

SKIN CONTACT

Wash the skin immediately with soap and water. Get medical attention promptly if symptoms occur after washing.

EYE CONTACT

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Extinguish with foam, carbon dioxide or dry powder.

SPECIAL FIRE FIGHTING PROCEDURES

Use supplied air respirator if product is involved in a fire. Cool containers exposed to flames with water until well after the fire is out.

UNUSUAL FIRE & EXPLOSION HAZARDS

Flammable liquid. Avoid contact with open flames/sparks/static and heat. Vapours can form an ignitable or explosive mixture with air. Can form explosive mixtures at temperatures at or above the flash point. Vapours can flow along surfaces to a distant ignition source and flash back.

PROTECTIVE MEASURES IN FIRE

Leave danger zone immediately. Do not enter fire area without proper personal protective equipment, including AS/NZS-1716 approved self-contained breathing apparatus.

HAZCHEM CODE 3[Y]

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear suitable protective clothing, gloves and safety goggles.

ENVIRONMENTAL PRECAUTIONS

Dike to prevent entering any sewer or waterway.

SPILL CLEAN UP METHODS

Absorb in vermiculite, dry sand or earth and place into containers.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Avoid spilling, skin and eye contact.

STORAGE PRECAUTIONS

The drums should be stored, with their seals intact, in conditions that avoid extremes of temperatures. Comply with the requirements of NOHSC:1015 (2001) - Storage and Handling of Workplace Dangerous Goods. Comply with the requirements of AS1940 - The Storage and Handling of Flammable and Combustible Liquids.

STORAGE CLASS

Flammable liquid storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT COMMENTS

No exposure limits noted for ingredient(s).

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

Use engineering controls to reduce air contamination to permissible exposure level.

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Respirator use is not expected to be necessary under normal conditions of use. In poorly ventilated areas, emergency situations or if exposure levels are exceeded, use AS/NZS-1716 approved full face respirator. CCROVAG, CCR with organic vapour & acid gas cartridge.

HAND PROTECTION

Use protective gloves made of: Neoprene. Nitrile.

EYE PROTECTION

Wear approved chemical safety goggles where eye exposure is reasonably probable. Use full face shield if splashes could occur.

OTHER PROTECTION

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENE MEASURES

Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly with soap & water if skin becomes contaminated. Promptly remove any clothing that becomes contaminated.

PERSONAL PROTECTION

Personal protective equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended to determine the level of personal protective equipment appropriate for specific job tasks and conditions.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid
COLOUR	Light Yellow to Dark Orange / Brown
ODOUR	Sweet.
SOLUBILITY	Dispersible in water
RELATIVE DENSITY	Typically 0.945 @ 20°C
pH-VALUE, DILUTED SOLUTION	6 - 9 (5% in 75% IPA/25% Water)
FLASH POINT (°C)	49°C TCC (Tag closed cup).
FLAMMABILITY LIMIT - LOWER(%)	1.8%
FLAMMABILITY LIMIT - UPPER(%)	6.8%

10 STABILITY AND REACTIVITY

STABILITY

No particular stability concerns.

CONDITIONS TO AVOID

Avoid contact with strong oxidisers.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong oxidising substances. Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

Vapours/gases/fumes of: Carbon dioxide (CO_2). Carbon monoxide (CO).

11 TOXICOLOGICAL INFORMATION

INHALATION

Prolonged, repeated or high exposures may cause irritation to the respiratory tract (nose, mouth, mucous membranes).

INGESTION

May be harmful if swallowed. Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract. May irritate and cause stomach pain, vomiting and diarrhoea. May cause nausea, headache, dizziness and intoxication.

SKIN CONTACT

Brief, intermittant skin contact may cause mild to moderate irritation. Repeated or prolonged contact may cause dermatitis, drying or cracking of skin due to the defatting properties of the solvent.

EYE CONTACT

Contact with eyes may cause moderate to severe irritation with reversible eye injury.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

There are no data on the ecotoxicity of this product.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable local, state and federal regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change. Place chemical residues and contaminated absorbent materials into a suitable waste container. Take to an approved waste disposal site.

14 TRANSPORT INFORMATION

PROPER SHIPPING NAME	FLAMMABLE LIQUID, N.O.S. (contains terpene hydriocarbons)
UN NO.	1993
DG CLASS	Class 3: Flammable liquids.
PACKING GROUP	III
HAZCHEM CODE	3[Y]
UN NO. SEA	1993
IMDG CLASS	3
IMDG PACK GR.	III
UN NO. AIR	1993
AIR CLASS	3
AIR PACK GR.	III
HAZCHEM CODE	3[Y]

15 REGULATORY INFORMATION

LABELLING

Irritant

Dangerous for the environment

CONTAINS d-LIMONENE

RISK PHRASES

R10	Flammable.
R36/38	Irritating to eyes and skin.
R43	May cause sensitisation by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY PHRASES

S24/25	Avoid contact with skin and eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37	Wear suitable gloves.
S57	Use appropriate containment to avoid environmental contamination.
S61	Avoid release to the environment. Refer to special instructions/safety data sheets.

POISONS SCHEDULE NUMBER Not scheduled

NATIONAL REGULATIONS AND REFERENCES

National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. National Code of Practice for the Storage and Handling of Workplace Dangerous Goods. Approved Criteria for Classifying Hazardous Substances.

16 OTHER INFORMATION

GENERAL INFORMATION

The information in the MSDS is based on data which is considered to be accurate. Baker Petrolite, however, makes no guarantees or warranty, either expressed or implied on the accuracy or completeness of this information. The conditions of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product. This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

REVISION COMMENTS

Revision has taken place in section 9, and 16

REVISION DATE 19/05/2009

REV. NO./REPL. SDS GENERATED 2

RISK PHRASES IN FULL

R10	Flammable.
R36	Irritating to eyes.
R36/38	Irritating to eyes and skin.
R38	Irritating to skin.
R43	May cause sensitisation by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Material Safety Data Sheet

TRETOLITE* RBW24136

1 . Identification of the material and supplier

Names

Product name : TRETOLITE* RBW24136

Product code : RBW24136

ADG : Corrosive liquid, n.o.s. (potassium hydroxide)

Supplier : 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)

Uses

Material uses : Water Clarifier

2 . Hazards identification

Classification : C; R34

Risk phrases : R34- Causes burns.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Statement of hazardous/dangerous nature : HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
potassium hydroxide	1310-58-3	1 - 5

Other ingredients, determined not to be hazardous according to Safe Work Australia criteria, and not dangerous according to the ADG Code, make up the product concentration to 100%.

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.

4 . First-aid measures

Inhalation : 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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

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.

4 . First-aid measures

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.

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.

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.

Advice to doctor : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

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

Not suitable : None known.

Special exposure hazards : 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.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
metal oxide/oxides

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.

Hazchem code : 2X

6 . Accidental release measures

Personal precautions : 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 (see Section 8).

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).

Small spill : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.

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

Storage : 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

Occupational exposure limits

Ingredient name	Exposure limits
potassium hydroxide	**Safe Work Australia (Australia, 8/2005).** PEAK: 2 mg/m³ 15 minute(s).

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : 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.

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eyes : 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 or dusts.

Hands : 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.

Respiratory : 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.

Skin : 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.

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.

9 . Physical and chemical properties

Physical state : Liquid.

Colour : Amber. to Red.

Odour : Rotten eggs.

Relative density : 1.08 (20°C)

pH : 10.5 to 12

Viscosity : Kinematic: <0.2 cm^2/s (<20 cSt)

Solubility : Soluble in water

10 . Stability and reactivity

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.

Materials to avoid : No specific data.

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

11 . Toxicological information

Potential acute health effects

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Ingestion : May cause burns to mouth, throat and stomach.

Skin contact : Corrosive to the skin. Causes burns.

Eye contact : Corrosive to eyes. Causes burns.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
potassium hydroxide	LD50 Oral	Rat	273 mg/kg	-

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
potassium hydroxide	Eyes - Moderate irritant	Rabbit	-	-	-
	Skin - Severe irritant	Guinea pig	-	-	-
	Skin - Severe irritant	Human	-	-	-
	Skin - Severe irritant	Rabbit	-	-	-

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : 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.

Inhalation : No specific data.

Ingestion : Adverse symptoms may include the following: stomach pains Irritation to digestive system

Skin : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Eyes : Adverse symptoms may include the following:
pain
watering
redness

Target organs : Contains material which may cause damage to the following organs: lungs, upper respiratory tract, skin, eye, lens or cornea.

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
potassium hydroxide	Acute LC50 80000 ug/L Fresh water	Fish - Gambusia affinis - Adult	96 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

Regulation	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADG	UN1760	Corrosive liquid, n.o.s. (potassium hydroxide)	8	III		**Hazchem code** 2X
ADR	UN1760	Corrosive liquid, n.o.s. (potassium hydroxide)	8	III		**UK Hazchem:** 2X
IMDG	UN1760	Corrosive liquid, n.o.s. (potassium hydroxide)	8	III		-
IATA	UN1760	Corrosive liquid, n.o.s.(potassium hydroxide)	8	III		-

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

5

Control of Scheduled Carcinogenic Substances

Ingredient name	Schedule
No listed substance	

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

EU Classification : C; R34

Risk phrases : R34- Causes burns.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

National regulations : **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

16 . Other information

Date of printing	:	21 January 2013.
Date of issue/ Date of revision	:	21 January 2013
Date of previous issue	:	No previous validation
Version	:	1

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.

REVISION DATE: 21/08/2009

SAFETY DATA SHEET
MAGNACIDE® B

1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME	MAGNACIDE® B
PRODUCT NO.	MAGNACIDE® B, XCB
APPLICATION	Microbiocide
SUPPLIER	Baker Petrolite, Australia 5 Walker Street Braeside Vic. 3195 Australia Tel: +613 9580 9004 Fax: +613 9580 6004
CONTACT PERSON	AUSTRALIA HS&E Specialist - Asia Pacific Region Tel: (613) 9586 0720 - Business hours USA Baker Petrolite, A Baker Hughes Company 12645 West Airport Boulevard PO Box 5050 Sugarland, TX 77487-5050 For product information / MSDSs 0011 1 281 276 5400
EMERGENCY TELEPHONE	AUSTRALIA: In the event of an emergency ring Orica Emergency Response Service (formerly known as SHE Pacific) - 1800 033 111 for specialist advice. Note: This number is continually manned for emergencies only. INTERNATIONAL: CHEMTREC International:- +1 703 527 3887 (International 24 hour)

2 HAZARDS IDENTIFICATION

HAZARD ID

Highly flammable. Very toxic by inhalation. Causes burns. May cause sensitisation by skin contact. Toxic in contact with skin and if swallowed. Very toxic to aquatic organisms.
Overexposure to vapours may be fatal. Inhalation exposure studies have determined the rat LC50 to be 26 ppm at one hour exposure and at four hour exposure to be 8.3 ppm. The NIOSH IDLH (Immediately Dangerous to Life and Health) value is 2 ppm. The primary route of exposure is inhalation; acute exposure may result in lacrimation, tracheobronchitis, pneumonia, and lung injury (at 20 ppm). The low odour detection (0.03 - 0.21 ppm) and irritation threshold (0.25 - 0.5 ppm) and acutely irritating effects of acrolein usually prevent chronic toxicity effects. Splashes to the eye may result in blepharoconjunctivitis (bloodshot eyes), lid oedema, fibrinous or pustular discharge, and deep or long-lasting corneal injury. See Section 11 for additional information.

ENVIRONMENT

This product is very toxic to aquatic organisms.

HUMAN HEALTH

Eyes:- May be severely irritating to the eyes. Prolonged contact may cause burns.
Skin:- May be severely irritating to the skin. May cause burns on prolonged contact. May cause sensitisation by skin contact. May cause allergic skin reactions with repeated exposures. May be toxic if absorbed through the skin.

Inhalation:- May be highly toxic if inhaled. May cause respiratory sensitisation (allergic reaction).
Ingestion:- Not considered a likely route of exposure; however, may be toxic if swallowed.

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE (According to criteria of NOHSC). DANGEROUS GOODS (According to ADG Code).

SAFETY PHRASES

S16	Keep away from sources of ignition - No smoking.
S26	In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre.
S38	In case of insufficient ventilation, wear suitable respiratory equipment.
S45	In case of accident or if you feel unwell seek medical advice immediately.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection. Wear suitable protective clothing, gloves and eye/face protection.
S61	Avoid release into the environment. Refer to special instructions/safety data sheet.
P14	Contains HYDROQUINONE. May produce an allergic reaction

DG CLASS

Class 6.1: Toxic substances.

SUBSIDUARY RISK	3
PACKING GROUP	I
UN NO.	1092
HAZCHEM CODE	2WE

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS No.	Content	Classification
ACROLEIN	203-453-4	107-02-8	~ 95 %	F;R11 T+;R26 T;R24/25 C;R34 N;R50
HYDROQUINONE	204-617-8	123-31-9	< 1 %	Carc3;R40 Muta3;R68 Xn;R22 R43 Xi;R41 N;R50

The Full Text for all R-Phrases are Displayed in Section 16

4 FIRST-AID MEASURES

GENERAL INFORMATION

Persons exposed to vapours may have a delayed reaction and experience severe irritation of the respiratory tract and delayed pulmonary oedema. Therefore, it is strongly advised to keep person exposed to high concentrations of vapour under observation for at least 24 hours following exposure. Measures against circulatory shock, respiratory depression, and convulsion may be needed.

NOTES TO THE PHYSICIAN

Treatment of the irritative effects of acrolein should be symptomatic and supportive. Following inhalation of acrolein, signs of respiratory dysfunction should be sought and hypoxia corrected. Specific treatment for bronchospasm and non-cardiogenic pulmonary oedema may be necessary. Hypoxia may also occur following the ingestion of acrolein if there is pulmonary aspiration and/or laryngeal oedema. The extent and severity of the corrosive effects on the upper gastrointestinal mucosa should be determined, for example, by endoscopy, and advice should be sought regarding the need for surgical intervention. Probable mucosal damage may contraindicate the use of gastric lavage.

INHALATION

Remove victim immediately from source of exposure. Provide rest, warmth and fresh air. Get medical attention. If respiratory

problems, artificial respiration/oxygen.

INGESTION

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Wash out mouth with water if person is conscious. If fully conscious promptly drink one to two glasses of water. Never induce vomiting or give anything by mouth to a victim who is unconscious or having convulsions. Get medical attention immediately.

SKIN CONTACT

Remove contaminated clothing. Wash affected area with soap and mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

EYE CONTACT

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention immediately.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Fire can be extinguished using: Alcohol Resistant Foam. Dry chemicals. Carbon dioxide (CO2).

SPECIAL FIRE FIGHTING PROCEDURES

Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and public water ways. Note that flammable vapours may form an ignitable mixture with air. Vapours may travel considerable distances and flash back if ignited.

UNUSUAL FIRE & EXPLOSION HAZARDS

Flammable liquid. Avoid contact with open flames/sparks/static and heat. Vapours can form an ignitable or explosive mixture with air. Can form explosive mixtures at temperatures at or above the flash point. Vapours can flow along surfaces to a distant ignition source and flash back.

SPECIFIC HAZARDS

Toxic gases/vapours/fumes of Oxides of: Carbon. Peroxides.

PROTECTIVE MEASURES IN FIRE

Do not enter fire area without proper personal protective equipment, including AS/NZS-1716 approved self-contained breathing apparatus.

HAZCHEM CODE

2WE

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Evacuate all personnel to an upwind area and determine medical treatment needs. If qualified to do so through appropriate training contain or mitigate the spill as outlined below. Put on appropriate personal protective equipment. See Section 8 for information on use of respiratory protection appropriate for dealing with small spills. For large spills, wear fully encapsulating, vapour protective clothing (Level A Suit) and seek assistance from local fire department hazardous materials response team. Keep personnel removed and upwind of spill. Shut off all ignition sources; no flares, smoking, or flames in spill area. Approach release from upwind. Ventilate the release area.

ENVIRONMENTAL PRECAUTIONS

Dike to prevent entering any sewer or waterway.

SPILL CLEAN UP METHODS

LARGE SPILLS:- Vapour suppression: if available, blanket spill area with alcohol resistant foam to reduce the vapour concentration. Reapply foam as needed to counteract the rapid breakdown of the foam blanket. Pump bulk fluid to appropriate storage containers for proper disposal. After recovery of the bulk fluid, neutralization of any remaining material can be accomplished by covering with sodium carbonate (soda ash) and mixing with water. Ratio is 2.5 kg of soda ash to each litres of acrolein followed by 5 litres of water per litre of acrolein. The soda ash and acrolein will form a solid by-product after addition of water. When deactivation is complete, scoop the solid material into properly marked containers for disposal. Contain all water for proper disposal. Prevent runoff from entering drains, sewers or waterways. SMALL SPILLS (< 0.5 kg):- Cover release with

sodium carbonate (soda ash) and mix into spill with water. The soda ash and acrolein will form a solid by-product after addition of water. Alternately, absorb with paper towel, dry sand or other absorbent. For ground or surface contamination, remove contaminated media and dispose of properly. Contain all water for proper disposal.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Wear appropriate personal protective equipment. Avoid contact with eyes, skin and clothing. Avoid breathing vapours or spray mists. Use only with adequate ventilation. Store in a secure and well ventilated area. Keep away from heat, sparks and flame. Keep away from incompatible materials. Keep container tightly closed when not in use. To avoid fire or explosion, ensure containers and equipment are properly bonded and grounded prior to transferring product. This is normally accomplished through the use of Baker Petrolite-specified standard application procedures. When using product under non-routine conditions (e.g., laboratory samples), ensure material and container are properly bonded and grounded.

STORAGE PRECAUTIONS

Store in a secured and well ventilated area. Keep away from heat, sparks and flame. Keep away from incompatibles. Keep container tightly closed and dry. To avoid fire or explosion, ground container equipment and personnel before handling product. For return of used cylinders please contact your local BPC representative. Comply with the requirements of NOHSC:1015 (2001) - Storage and Handling of Workplace Dangerous Goods. Comply with the requirements of AS1940 - The Storage and Handling of Flammable and Combustible Liquids.

STORAGE CLASS

Flammable liquid storage. Toxic storage. Environmentally hazardous storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	Std	LT - ppm	LT – mg/m^3	ST - ppm	ST – mg/m^3
HYDROQUINONE	MEL		0.5 mg/m^3		
ACROLEIN	OES	0.1 ppm	0.23 mg/m^3	0.3 ppm	0.7 mg/m^3
MAGNACIDE® B	OES	0.1 ppm		0.3 ppm	

INGREDIENT COMMENTS

OES = Occupational Exposure Standard. MEL = Maximum Exposure Limit.

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapour s or mists below their respective threshold limit value. Ensure that adequate wash water, such as eyewash stations and safety showers, are proximal to the work location.

ENGINEERING MEASURES

Explosion-proof general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Full-face respirator use is required when connecting or disconnecting containers to application equipment, or any situations where the permissible exposure limit may be exceeded. As per AS/NZS-1716, full-face air-purifying respirators may be worn to protect personnel up to 2 ppm (IDLH) acrolein. The air purifying respirators should have organic vapour cartridge(s) or canister and a protection factor of 50. Exposure levels of unknown concentrations or greater than 2 ppm acrolein require the use of full-face positive pressure supplied-air breathing apparatus with a protection factor of 10,000.

HAND PROTECTION

Butyl rubber gloves; replace as needed.

EYE PROTECTION

Wear approved safety goggles.

OTHER PROTECTION

Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear long sleeved shirts and work pants. Wear chemical resistant boots or shoes.

HYGIENE MEASURES

Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly with soap & water if skin becomes contaminated. Promptly remove any clothing that becomes contaminated.

PERSONAL PROTECTION

Personal protective equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended to determine the level of personal protective equipment appropriate for specific job tasks and conditions.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid		
COLOUR	Colourless to light yellow		
ODOUR	Aldehyde		
SOLUBILITY	Moderately soluble in water		
BOILING POINT (°C)	53°C @ 760 mm Hg	**MELTING POINT (°C)**	- 86.7°C
RELATIVE DENSITY	0.847 @ 16°C	**VAPOUR DENSITY (air=1)**	1.94
VAPOUR PRESSURE	234.9 mmHg @ 22°C	**VOLATILE BY VOL. (%)**	VOC > 95%
pH-VALUE, DILUTED SOLUTION	6 max. 10% in water	**VISCOSITY**	0.329 cps @ 20°C
FLASH POINT (°C)	- 25°C TCC (Tag closed cup)	**AUTO IGNITION TEMPERATURE (°C)**	220°C
FLAMMABILITY LIMIT - LOWER(%)	2.8%	**FLAMMABILITY LIMIT - UPPER(%)**	31%
SOLUBILITY VALUE (g/100g H_2O@ 20°C)	Soluble (22% by weight @ 20°C)		

10 STABILITY AND REACTIVITY

STABILITY

This product is stable unless there is loss of stabiliser (aka inhibitor).

CONDITIONS TO AVOID

Avoid contact with: Open flames/sparks/static, heat, light and water contamination of storage tanks.

HAZARDOUS POLYMERISATION

Hazardous polymerization may occur. Loss of hydroquinone stabilizer may result in polymerization under certain conditions. Air introduced into closed containers may cause a slow polymerization, resulting in loss of product quality.

MATERIALS TO AVOID

Alkalies, amines, light, and oxidising materials. Alkaline or strong acid contamination can cause a reaction which can be rapid and violent. Alkalies, amines, light, and oxidising materials. Alkaline or strong acid contamination can cause a reaction which can be rapid and violent. Prevent water contamination of acrolein storage containers.

HAZARDOUS DECOMPOSITION PRODUCTS

Vapours/gases/fumes of: Carbon dioxide (CO2). Carbon monoxide (CO). Peroxides.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION

Oral (LD50):	29 mg/kg [Rat]; 11.8 mg/kg [Female rat]; 10.3 mg/kg [Male rat].
Dermal (LD50):	231.4 mg/kg [Rabbit].
Vapour (LC50):	26 ppm at 1 hour [Rat], 8.3 ppm at 4 hours [Rat]
Irritation - Draize Test (Rabbit)	Skin - 2 mg/24H: Severe Eye - 50 µg/24H: Severe Skin - 15 ppm solution: Not irritating

TOXICITY DATA

1)Acrolein
A potential human health effect resulting from overexposure is the development of permanent lung damage in the form of decreased pulmonary (lung) function, and delayed pulmonary oedema (fluid in the lungs) which can lead to chronic respiratory disease. As a highly reactive aldehyde, prolonged or repeated overexposures can produce long-term respiratory effects by significantly reducing ciliary action in the upper airways (i.e., interfering with the body's ability to clear mucous and foreign substances from the respiratory tract) and causing tissue damage throughout the lungs manifested as emphysema.

Acrolein may cause allergies, including skin rash, hives, and asthma characterized by delayed hypersensitivity (RTECS). Levels of 0.4 to 4.9 ppm caused eye and nose irritation and structural changes in the respiratory system of hamsters, rats and rabbits (Ref. 1). Acrolein produced greater susceptibility to respiratory infections in mice (Ref. 2) and rats (Ref. 3).

DEVELOPMENTAL/REPRODUCTION STUDIES

Acrolein has been tested for developmental and reproductive health effects. Results from developmental studies (Ref. 4, 5) indicated this material did not cause teratogenic effects in rats or rabbits at doses that caused maternal toxicity. A two-generation rat reproductive study (Ref. 6) did not reveal any evidence of reproductive toxicity in either sex from any treatment group (maximum dose = 7.2 mg/kg). A second two-generation reproductive study in rats did not reveal any evidence of reproductive toxicity in either sex from any treatment group (maximum dose = 6 mg/kg) (Ref. 6).

DERMAL TESTING

In a 21 day dermal toxicity test in rabbits dosed at 7, 21 and 63 mg/kg of acrolein, toxicity was evidenced by slight to significant reduction in body weight gain, nasal mucous discharge, lethargy, slight to moderately lowered food consumption and increased frequency of lesions of the skin and lungs. Slight mortality in female rabbits dosed at 21 and 63 mg/kg was observed. No notable effects in haematology, blood chemistry, organ weights or organ weight ratios were observed (Ref. 7).

INHALATION TOXICITY STUDY

Rats were exposed by inhalation (6h/day 5 d/week for 62 days) to 0, 0.4, 1.4 and 4.0 ppm acrolein. Mortality was only observed in the 4 ppm group and was due mainly to acute bronchopneumonia. Weight gain in the 4 ppm group was significantly slower than the control group. Examination of the 4 ppm group revealed bronchiolar epithelial necrosis and sloughing and oedema (Ref. 8).

CHRONIC TOXICITY/ONCOGENICITY STUDIES

In a 12-month chronic toxicity test in dogs (Ref. 9), the highest dose (2 mg/kg) tested resulted in changes in blood chemistry, but no compound-related tumours or lesions were observed. An 18-month oncogenicity study in mice (Ref. 10) did not reveal any compound-related tumours or lesions; the highest dose tested (4.5 mg/kg) resulted in increased mortality in the test group. A 24-month chronic toxicity/oncogenicity study in rats (Ref. 11) also did not reveal any
compound related tumours or lesions. The high dose, 2.5 mg/kg, caused an increased mortality in the test group. No indications of cancer were found in the tests.

MUTAGENICITY STUDIES

Effects of Acrolein on the In Vitro Induction of Chromosomal Aberrations in CHO Cells: No significant increase in the number of chromosomal aberrations above the background (Ref. 12). Effects of Acrolein on the In Vivo Induction of Chromosomal Aberrations in Rat Bone Marrow Cells: No significant increase in the number of chromosomal aberrations above the background (Ref. 13). Salmonella Liquid Suspension Mutant Fraction Assay: Acrolein did not induce concentration-dependent mutagenicity in any of the 5 Salmonella strains, either in the presence or absence of metabolic activation (Ref. 14).

METABOLISM DATA

Metabolism studies in freshwater fish, shellfish, goats, hens, rats and leaf lettuce indicate that acrolein is metabolized and does not accumulate in the tissue (Ref. 15-19).

GENERAL INFORMATION

Exposure to this product may aggravate medical conditions involving the following: heart, cardiovascular system, respiratory tract, skin/epithelium, eyes.

TARGET ORGANS

Respiratory tract, eyes, skin/epithelium, cardiovascular system. Based on the presence of hydroquinone, and information in the EU Risk Assessment on acrolein, Baker Petrolite has taken a precautionary approach and classified this product as a skin sensitiser.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

This product is very toxic to aquatic organisms.

Bluegill sunfish (Lepomis macrochirus)	96H LC50:	24 ppb
Rainbow trout (Oncorhynchus mykiss)	96H LC50:	24 ppb
Water flea (Daphnia magna)	48H LC50:	22 ppb
Eastern oysters (Crassostrea virginica)	96H EC50:	180 ppb
Mysid shrimp (Mysidopsis bahia)	96H LC50:	500 ppb
Mysid shrimp (Holmesimysis costata)	96H LC50:	790 ppb
Sheepshead minnows (Cyprinodon variegatus)	96H LC50:	570 ppb
Marine copepod (Acartia tonsa)	48H LC50:	55 ppb
Saltwater diatom (Skeletonema costatum)	120H EC50:	27 ppb

DEGRADABILITY

In an aerobic aquatic metabolism study, the water phase revealed the rapid degradation of acrolein with all metabolites further mineralized to carbon dioxide. Results indicate hydration was an early step in acrolein degradation. The first -order kinetic half-life of acrolein was determined to be 33.7 hours in the water phase under laboratory conditions. Under field conditions, the half-life of acrolein in freshwater ranged from six to ten hours (Ref. 20).

In an aerobic soil metabolism study the half-life of acrolein was found to be 4.2 hours in soil-water mixtures and was ultimately transformed into carbon dioxide (Ref. 21).

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable state and local regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change. Do not clean or reuse empty container.

For return of used cylinders please contact your local BPC representative.

14 TRANSPORT INFORMATION

PROPER SHIPPING NAME ACROLEIN, STABILISED

MAGNACIDE® B

DG CLASS	Class 6.1: Toxic substances	**ADR CLASS NO.**	6.1
UN NO.	1092	**PACKING GROUP**	I
HAZCHEM CODE	2WE	**UN NO. SEA**	1092
IMDG CLASS	6.1	**IMDG PACK GR.**	I
HAZCHEM CODE	2WE	**IMDG SUB CLASS**	3
SUBSIDUARY RISK	3		
MARINE POLLUTANT	Yes		

15 REGULATORY INFORMATION

LABELLING


Very Toxic


Corrosive


Highly Flammable


Dangerous for the environment

CONTAINS ACROLEIN

RISK PHRASES

R11	Highly flammable
R24/25	Toxic in contact with skin and if swallowed.
R26	Very toxic by inhalation.
R34	Causes burns.
R43	May cause sensitisation by skin contact.
R50	Very toxic to aquatic organisms.

SAFETY PHRASES

S16	Keep away from sources of ignition - No smoking.
S26	In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre.
S38	In case of insufficient ventilation, wear suitable respiratory equipment.
S45	In case of accident or if you feel unwell seek medical advice immediately.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection. Wear suitable protective clothing, gloves and eye/face protection.
S61	Avoid release into the environment. Refer to special instructions/safety data sheet.
P14	Contains HYDROQUINONE. May produce an allergic reaction

POISON SCHEDULE NUMBER

S7

NATIONAL REGULATIONS AND REFERENCES

National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Preparation of

Material Safety Data Sheets. National Code of Practice for the Storage and Handling of Workplace Dangerous Goods. Approved Criteria for Classifying Hazardous Substances.

16 OTHER INFORMATION

GENERAL INFORMATION

The information in the MSDS is based on data which is considered to be accurate. Baker Petrolite, however, makes no guarantees or warranty, either expressed or implied on the accuracy or completeness of this information. The conditions of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product. This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

INFORMATION SOURCES

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5. Parent, Richard A., Halina E. Caravello, and James E. Long, Oncogenicity Study of Acrolein in Mice. Journal of the American College of Toxicology. 10(6), 647-659 (1991).
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8. A Sub-Chronic Inhalation Study of Fischer 344 Rats Exposed to 0, 0.4, 1.4, or 4.0 ppm Acrolein. Brookhaven National Laboratory, Upton, NY, 1981.
9. Parent, R.A., Caravello, H.E., Balmer, M.F., Shellenberger, T.E., and J.E. Long, One Year Chronic Toxicity of Orally Administered Acrolein to Beagle Dogs. J. Appl. Tox. 12(0): 1 -9 (1992).
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14. Salmonella Liquid Suspension Mutant Fraction Assay, Bioassay Systems, Woburn, MA, 1980 (Unpublished Study).
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21. Estimation of the Aerobic Biotransformation Rates of Acrolein (MAGNACIDE® H Herbicide, MAGNACIDE® B Biocide) in Soil, SRI International, Menlo Park, CA, (1990) (Unpublished Study).

MAGNACIDE® B

REVISION COMMENTS

Revision has taken place in sections: 5, 6

REVISION DATE

21/08/2009

RISK PHRASES IN FULL

R11	Highly flammable.
R22	Harmful if swallowed.
R24/25	Toxic in contact with skin and if swallowed.
R26	Very toxic by inhalation.
R34	Causes burns.
R40	Limited evidence of a carcinogenic effect.
R41	Risk of serious damage to eyes.
R43	May cause sensitisation by skin contact.
R50	Very toxic to aquatic organisms.
R68	Possible risk of irreversible effects.

BAKER HUGHES

Baker Petrolite

SAFETY DATA SHEET

CRW24830

1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME	CRW24830
PRODUCT NO.	CRW24830
APPLICATION	Hydrotest corrosion inhibitor
SUPPLIER	Baker Petrolite, Australia 5 Walker Street Braeside Vic. 3195 Australia Tel: +613 9580 9004 Fax: +613 9580 6004
CONTACT PERSON	FOR MSDS RELATED QUERIES, CONTACT PAUL CHAPMAN VIA EMAIL AT: paul.chapman2@bakerhughes.com
EMERGENCY TELEPHONE	AUSTRALIA: In the event of an emergency ring Orica Emergency Response Service (formerly known as SHE Pacific) - 1800 033 111 for specialist advice. Note: This number is continually manned for emergencies only. INTERNATIONAL: CHEMTREC International:- +1 703 527 3887 (International 24 hour)

2 HAZARDS IDENTIFICATION

HAZARD ID

Irritating to eyes and skin.

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE (According to criteria of ASCC). NON-DANGEROUS GOODS (According to ADG Code).

SAFETY PHRASES

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Avoid contact with skin and eyes. Wear suitable protective clothing, gloves and eye/face protection.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
2-(2-BUTOXYETHOXY)ETHANOL	203-961-6	112-34-5	10-30%	Xi;R36
AMMONIUM BISULPHITE	233-469-7	10192-30-0	10-30%	Xi;R36/37/38. R31.
BENZYL ALKYL DIMETHYL AMMONIUM CHLORIDE		8001-54-5	5-10%	Xn;R22. C;R34. Xi;R41.
ETHANEDIOL	203-473-3	107-21-1	5-10%	Xn;R22

4 FIRST-AID MEASURES

NOTES TO THE PHYSICIAN

Treat symptomatically. Consult Poisons Information Centre.

INHALATION

Remove victim immediately from source of exposure. Provide rest, warmth and fresh air. Get medical attention if any discomfort continues. If respiratory problems, artificial respiration/oxygen.

INGESTION

Immediately rinse mouth and drink plenty of water (200-300 ml). DO NOT induce vomiting. Get medical attention immediately. NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS!

SKIN CONTACT

Remove affected person from source of contamination. Wash the skin immediately with soap and water. Get medical attention promptly if symptoms occur after washing.

EYE CONTACT

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

This material is not flammable. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES

Use supplied air respirator if product is involved in a fire. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and public water ways. Cool containers exposed to flames with water until well after the fire is out.

PROTECTIVE MEASURES IN FIRE

Do not enter fire area without proper personal protective equipment, including AS/NZS-1716 approved self-contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear suitable protective clothing, gloves and safety goggles. Provide adequate ventilation.

ENVIRONMENTAL PRECAUTIONS

Dike to prevent entering any sewer or waterway.

SPILL CLEAN UP METHODS

Absorb in vermiculite, dry sand or earth and place into containers.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Avoid spilling, skin and eye contact.

STORAGE PRECAUTIONS

The drums should be stored, with their seals intact, in conditions that avoid extremes of temperatures.

STORAGE CLASS

Chemical storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT COMMENTS

No exposure limits available for the compounded product.

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

Use engineering controls to reduce air contamination to permissible exposure level.

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Respirator use is not expected to be necessary under normal conditions of use. In poorly ventilated areas, emergency situations or if exposure levels are exceeded, use AS/NZS-1716 approved full face respirator.

HAND PROTECTION

Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.

EYE PROTECTION

Wear approved chemical safety goggles where eye exposure is reasonably probable. Use full face shield if splashes could occur.

OTHER PROTECTION

Wear appropriate clothing to prevent any possibility of skin contact.

HYGIENE MEASURES

Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated.

PERSONAL PROTECTION

Personal protective equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended to determine the level of personal protective equipment appropriate for specific job tasks and conditions.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid
COLOUR	Clear Brown With Fluorescent tinge.
ODOUR	Mild
PHYSICAL DATA COMMENTS	Non flammable liquid
SOLUBILITY	Soluble in water
RELATIVE DENSITY	Typically 1.080 @ 20°C
pH-VALUE, CONC. SOLUTION	Typically 5 - 7

10 STABILITY AND REACTIVITY

STABILITY

No particular stability concerns.

CONDITIONS TO AVOID

Avoid excessive heat for prolonged periods of time.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong oxidising substances. Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

Vapours/gases/fumes of: Carbon monoxide (CO). Carbon dioxide (CO2). Nitrous gases (NOx). Sulphurous gases (SOx).

11 TOXICOLOGICAL INFORMATION

INHALATION

Not expected to be a problem under normal conditions of use. May cause irritation to the respiratory system.

INGESTION

May cause irritation to mouth, throat and stomach.

SKIN CONTACT

Contact with skin may produce irritation.

EYE CONTACT

May cause severe irritation to eyes.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

There are no data on the ecotoxicity of this product.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable local, state and federal regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change. Place chemical residues and contaminated absorbent materials into a suitable waste container. Take to an approved waste disposal site.

14 TRANSPORT INFORMATION

GENERAL	Not classified for transportation.
ROAD TRANSPORT NOTES	Not classified for road transport
RAIL TRANSPORT NOTES	Not classified for rail transport
SEA TRANSPORT NOTES	Not classified for sea transport
AIR TRANSPORT NOTES	Not Classified for Air Transport

15 REGULATORY INFORMATION

LABELLING

Irritant

RISK PHRASES

R36/38	Irritating to eyes and skin.

SAFETY PHRASES

S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S24/25	Avoid contact with skin and eyes.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.

POISONS SCHEDULE NUMBER S5

NATIONAL REGULATIONS AND REFERENCES

National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. National Code of Practice for the Storage and Handling of Workplace Dangerous Goods. Approved Criteria for Classifying Hazardous Substances.

16 OTHER INFORMATION

GENERAL INFORMATION

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REVISION COMMENTS

This is first issue.

REVISION DATE	14/12/2009
REV. NO./REPL. SDS GENERATED	1

RISK PHRASES IN FULL

R22	Harmful if swallowed.
R31	Contact with acids liberates toxic gas.
R34	Causes burns.
R36	Irritating to eyes.
R36/37/38	Irritating to eyes, respiratory system and skin.
R41	Risk of serious damage to eyes.

Material Safety Data Sheet

CRW24133

1 . Identification of the material and supplier

Names

Product name : CRW24133

Product code : CRW24133

Supplier : Baker Petrolite, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004
Fax: +613 9580 6004

Emergency telephone number : AUSTRALIA: In the event of an emergency ring Orica Emergency Response Service (formerly known as SHE Pacific) 1800 033 111 for specialist advice. Note: This number is continually manned for emergencies only. CHEMTREC International: +1 703 527 3887

Uses

Material uses : Corrosion inhibitor

2 . Hazards identification

Classification : Xi; R41
R43
R52/53

Risk phrases : R41- Risk of serious damage to eyes.
R43- May cause sensitisation by skin contact.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S24- Avoid contact with skin.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.

Statement of hazardous/dangerous nature : HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
Amines, N-tallow alkyltrimethylenedi-, ethoxylated	61790-85-0	10 - 30
rosin	8052-10-6	5 - 10
ethanediol	107-21-1	5 - 10
2-(2-butoxyethoxy)ethanol	112-34-5	5 - 10
Quaternary ammonium compounds, benzyl-C12-18-alkyldimethyl, chlorides	68391-01-5	1 - 5
propan-2-ol	67-63-0	1 - 5

Other ingredients, determined not to be hazardous according to NOHSC criteria, and not dangerous according to the ADG Code, make up the product concentration to 100%.

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.

4 . First-aid measures

Inhalation : 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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

4 . First-aid measures

Ingestion : 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. 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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

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.

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.

Advice to doctor : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

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

Not suitable : None known.

Special exposure hazards : 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. This material is harmful to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides
metal oxide/oxides

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.

6 . Accidental release measures

Personal precautions : 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 (see section 8).

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.

Small spill : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.

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

Storage : 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

Occupational exposure limits

Ingredient name	Exposure limits
ethanediol	**Safe Work Australia (Australia, 8/2005). Absorbed through skin.** TWA: 10 mg/m³ 8 hour(s). Form: Particulate STEL: 104 mg/m³ 15 minute(s). Form: Vapor TWA: 52 mg/m³ 8 hour(s). Form: Vapor TWA: 20 ppm 8 hour(s). Form: Vapor STEL: 40 ppm 15 minute(s). Form: Vapor
2-(2-butoxyethoxy)ethanol	**EH40/2005 WELs (United Kingdom (UK), 8/2007).** TWA: 10 ppm 8 hour(s). STEL: 15 ppm 15 minute(s). STEL: 15 mg/m³ 15 minute(s). TWA: 10 mg/m³ 8 hour(s).
propan-2-ol	**Safe Work Australia (Australia, 8/2005).** STEL: 1230 mg/m³ 15 minute(s). STEL: 500 ppm 15 minute(s). TWA: 983 mg/m³ 8 hour(s). TWA: 400 ppm 8 hour(s).

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eyes : 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 or dusts.

Hands : 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.

Respiratory : 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.

Skin : 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.

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.

9 . Physical and chemical properties

Physical state : Liquid.
Colour : Amber. to Brown.
Odour : Characteristic.
Relative density : 1.04 (20°C)
pH : 7
Viscosity : Kinematic: 0.5 cm^2/s (50 cSt)
Solubility : Soluble in water

10 . Stability and reactivity

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.
Materials to avoid : No specific data.
Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

Inhalation : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.
Skin contact : May cause sensitisation by skin contact.
Eye contact : Severely irritating to eyes. Risk of serious damage to eyes.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
ethanediol	LD50 Dermal	Rabbit	9530 uL/kg	-
	LD50 Oral	Rat	4700 mg/kg	-
2-(2-butoxyethoxy)ethanol	LD50 Dermal	Rabbit	2700 mg/kg	-
	LD50 Oral	Rat	4500 mg/kg	-
propan-2-ol	LD50 Intraperitoneal	Rabbit	667 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
	LD50 Oral	Rat	5045 mg/kg	-

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : 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.

11 . Toxicological information

Inhalation : No specific data.

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

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

Target organs : Contains material which may cause damage to the following organs: upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

12 . Ecological information

Ecotoxicity : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Amines, N-tallow alkyltrimethylenedi-, ethoxylated	Acute EC50 1 to 10 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 1 to 10 mg/l	Fish	96 hours
ethanediol	Acute LC50 >18500 mg/L Fresh water	Fish - Oncorhynchus mykiss	96 hours
2-(2-butoxyethoxy)ethanol	Acute LC50 1300000 ug/L Fresh water	Fish - Lepomis macrochirus - 33 to 75 mm	96 hours
propan-2-ol	Acute LC50 11130000 ug/L Fresh water	Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling) - 4 to 8 weeks - 1.1 to 3.1 cm	96 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Amines, N-tallow alkyltrimethylenedi-, ethoxylated	OECD	<60 % - Not readily - 28 days	-	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Amines, N-tallow alkyltrimethylenedi-, ethoxylated	-	-	Not readily

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

Regulation	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADG	Not regulated.		-	-		-
ADR	Not regulated.		-	-		-
IMDG	Not regulated.		-	-		-
IATA	Not regulated.		-	-		-

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

6

Sector of Use : Industrial
Professional

Control of Scheduled Carcinogenic Substances

Ingredient name	Schedule
No listed substance	

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

EU Classification : Xi; R41
R43
R52/53

HCS Classification : Target organ effects

Risk phrases : R41- Risk of serious damage to eyes.
R43- May cause sensitisation by skin contact.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S24- Avoid contact with skin.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.

National regulations : **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.**

16 . Other information

Date of printing : 11/1/2010.

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Date of previous issue : No previous validation.

Version : 1

Indicates information that has changed from previously issued version.

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