Rosette-1 Temporary Well Suspension Bridging Document Summary

Doc Number: DR-60-RW-10001.01

REV	DATE	DESCRIPTION	BY	CHK	ENG	EM/PM
1	13/02/14	Updated and reissued to DMP	JK	SM	SM	MHo
0	22/01/14	Issued to DMP	JK	SM	SM	MHo

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ABBREVIATIONS

AEL	Apache Energy Limited
EP	Environment Plan
GPSA	General Petroleum Support Activities
SOP	String of Pearls (flowlines and infrastructure)
VI	Varanus Island

1. INTRODUCTION

Apache Energy Ltd (Apache) proposes to carry out a temporary well suspension and pumping program on Rosette 01 water injection well in permit area PL/12 on Varanus Island.

The Rosette 01 well (previously a gas producing reservoir) has been used for water injection since 2003 and is one of three available water injection wells on Varanus Island.

The Rosette 01 well site located on Varanus Island is operated by Apache Northwest Pty Ltd (Apache), on behalf of the Joint Venture partners. Apache hold a 68.5% share, and its joint venture partners Kufpec Australia Pty Ltd (19.27%) and Harriet (Onyx) Pty Ltd (12.23%) hold the remaining portion of the permit.

Rosette 01 well suspension is temporary and driven by the reduced requirement for produced water injection due to declining operational fields (e.g. Harriet A and String of Pearls facilities have been shut in). Future side track or final Plug and Abandonment (P&A) of the Rosette well/reservoir will be decided at a future date.

The proposed suspension campaign will be conducted in accordance with accepted environment plans and the Rosette 01 Temporary Well Suspension Bridging Document (Document Number DR-60-RW-10001). The General Petroleum Support Activities Environment Plan (Document Number EA-00-RI-158) and the Varanus Island Hub Environment Plan (Document Number EA-60-RI-186) will be used to manage the suspension activities as they cover the expected environmental risks and control measures to be undertaken during the activities.

1.1 Schedule

The activity is expected to take 7 days to complete and is scheduled to start on 27 January, depending on suitable weather.

1.2 Compliance

The Rosette 01 Temporary Well Suspension Bridging Document (BD) was prepared for the proposed activity and the DMP determined on the 22 January 2014 (E0055/201301, APACHE, EARS EPBD 45134) that the BD meets the requirements of Regulation 11(1) of the *Petroleum Pipelines (Environment) Regulations 2012*. The activity will be conducted in accordance with all applicable legislation and regulations and specifically to meet the requirements of the Petroleum (Submerged Lands) Act 1982 (WA) and its regulations.

This summary has been prepared in accordance with section 2.4 of the DMP *Guidelines for the Preparation and Submission of an EP*.

2. LOCATION OF THE ACTIVITY

The surface location of the Rosette 01 well is shown in **Figure 1** and the location coordinates (GDA94 Zone 50) are provided in **Table 1** below.

Table 1: Location coordinates of the Rosette 01 well

Longitude	Latitude	Easting	Northing
115˚ 34’30.94” E	20˚ 39’ 18.90” S	351,580.70 mE	7,715,355.72 mN

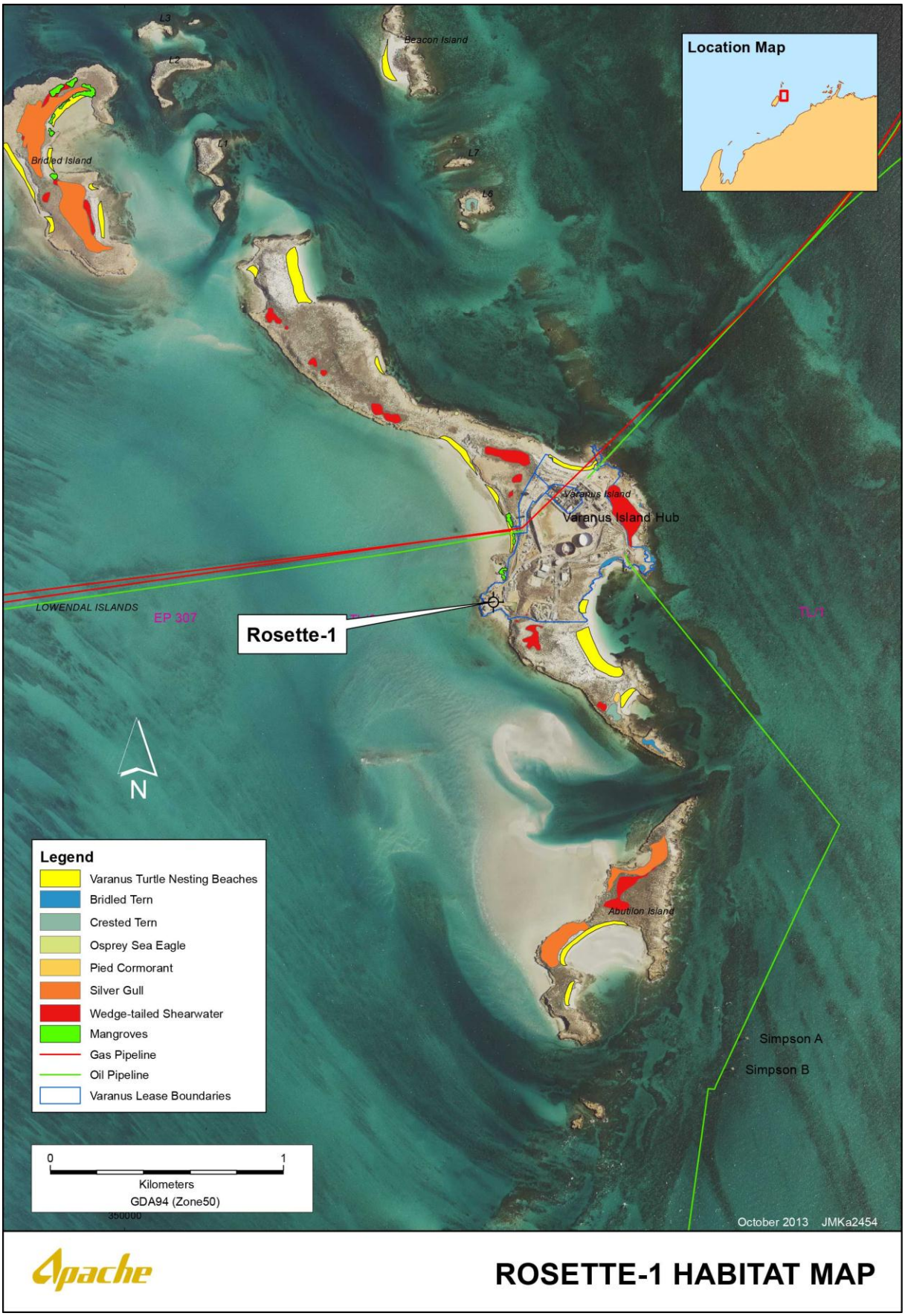

Figure 1: Rosette-01 Location and Sensitive Habitats

3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Physical and biological environment

A detailed description of the regional environment is provided in the Varanus Island Hub Environment Plan (Document Number EA-60-RI-186). Varanus Island is located in the North-West Marine Region, within the Northwest Shelf Province (DEWHA, 2008a) which lies primarily on the continental shelf between North West Cape and Cape Bougainville. The area has a dynamic oceanographic environment, influenced by strong tides, cyclonic storms, long-period swells and internal tides.

The Rosette 01 well is located within Lease 1902 and 2064 on Varanus Island, issued by the Conservation Commission of Western Australia. The immediate area surrounding Rosette 01 is hard consolidated limestone substrate devoid of vegetation, as it is used as a laydown and work area. Within 50 m of the wellhead are the bottom camp, the west wharf, the painters shed and the sewage plant. The nearest shearwater rookery, is located 120 m to the south east of the Rosette 01 wellhead, and the nearest turtle nesting beach (less frequented than other Varanus Island nesting beaches) is located 250 m to the north-northeast of the Rosette 01 wellhead (Mangrove Beach).

The marine habitat on the western side of Varanus Island is sandy sediments with small patches of exposed intertidal and shallow subtidal limestone pavement adjacent to the west mallard ramp.

As the proposed activities will be carried out on the island, it is not expected that the marine environment will be impacted by these activities. The majority of the activity will be carried out during daylight only, however, once the well kill operations start, the activity will need to continue as a 24 hour operation, expected to be required for two days.

Wastes generated during the activities will be collected and disposed of through Varanus Island.

3.2 Socio-economic environment

The proposed activities are not expected to interfere with other users of the sea or other stakeholders as the activity occurs on Varanus Island, within the Lease area.

4. ACTIVITY DESCRIPTION

Rosette 01 is to be suspended by carrying out a through tubing cement suspension. The suspension activity will be carried out by specialist contract personnel under the direct supervision of Apache appointed Well Service Supervisor.

The activity consists of temporary installing a well kill choke manifold and glycol injection skid between the water injection line and the Rosette wellhead to enable depressurisation of the well. Once depressurised, the well will be bullhead killed using treated seawater before setting one or two cement plugs. After successful suspension of the Rosette 01 well the water injection line will be flushed and purged to the East Spar slug catcher prior to disconnection of the temporary equipment.

The cement pill(s) required for the well suspension will be mixed onsite near the well utilising a hired batch mixer and cement bulky bags. Once the first pill has been mixed it will be pumped into the wellbore and displaced to the reservoir with one tubing volume of biocide inhibited seawater (at 300ppm concentration). If the first plug does not seal the well bore sufficiently, a second cement batch may be required to obtain full suspension. In this case, the well bore fluids (treated seawater) will be disposed of to the main bund.

On completion of the temporary suspension the well tubing will be left full of inhibited seawater.

5. CHEMICAL DISCLOSURE AND MANAGEMENT

For hydrate prevention during depressurising the Rosette 01 well, MEG will be injected into the system from a 1000L ISO container.

For well kill operations, seawater will be dosed with a preservation chemical, XC24380 (biocide) prior to setting a cement plug. No other chemicals will used during these activities. Full chemical disclosure and a copy of the SDS' is provided in **Appendices A** and **B**. It is expected that a total volume of 2000 L of MEG and

up to 300 L biocide and 1000L seawater may be required for the activities. Up to 23.8m^3 treated seawater will be disposed to the main bund via hard piping and flexible hoses prior to disposal in deep water injection bores. In the unlikely event that an accidental spillage of chemicals (or hydrocarbons) to the land occurs from these activities, Apache's emergency response procedures are in place to cover such an occurrence. Control and action of the response will be coordinated by Apache's Incident Response Team. The spill will be contained, reported, cleaned up and all wastes correctly disposed of according to Apache's Waste Management Plan. In the extremely unlikely event of a diesel spill to the environment (land or sea), Apache's Incident Response Plan and/or Oil Spill Contingency Plan will be activated. An Apache Oil Spill Response Vessel, the Monte Belle, and spill containment and recovery equipment are maintained on Varanus Island and in Dampier, as documented in Apache's OSCP.

6. ENVIRONMENTAL HAZARDS AND CONTROLS

Apache has assessed the environmental risks associated with this activity and concluded that the proposed works are a normal well intervention activity with minor environmental risks.

There is no planned waste discharge directly to the environment from the activity. The treatment chemicals will be stored in bunded areas near the activity site and spill clean-up material is available to manage any small spills.

Nigh-time operations are planned to occur for approximately 2 nights during proposed well kill operations. As the activities occur during the peak nesting season for turtles and seabirds, these species may potentially be impacted by any lighting requirements during these operations. For the night time operations only three lights will be required to safely manage the well suspension activities. The lights will consist of three yellow fluorescent tubes and will be placed to avoid any direct light spill to the North East turtle nesting beaches.

7. MANAGEMENT APPROACH

The activities will be managed in compliance with the *General Petroleum Support Activities Environment Plan* (Document Number EA-00-RI-158), the *Varanus Island Hub Environment Plan* (Document Number EA-60-RI-186), the Varanus Island Rosette 01 Temporary Well Suspension Bridging Document (Document number DR-60-RW-10001) and the Varanus Island Lighting Management Plan (Document Number AE-60-RI-153).

The primary goal of the environmental guidelines and commitments outlined in the GPSA EP and the BD are to direct, review and manage activities so that environmental impacts and risks are continually being reduced to ALARP. The identified potential hazards and environmental management controls are summarised in **Table 2**.

Table 2: Apache Environmental Guidelines and Commitments

Activity	Requirement
Incident reporting	• Reportable incidents to be reported to DMP (Environment Division Duty Officer on 0419 960 621) within 2 hours and emailed to petroleum.environment@dmp.wa.gov.au. (Petroleum (Submerged Lands) (Environment) Regulations 2012). • Recordable incidents to be reported to DMP by email petroleum.environment@dmp.wa.gov.au no later than 15 days after the end of each calendar month (Petroleum (Submerged Lands) (Environment) Regulations 2012). • Counts and details of fauna mortality are reported to the DPAW Karratha Office by phone (9182 2000) and reporting form.
Introduction of non-native flora and fauna species	• All goods and equipment shipped to Varanus Island adhere to Apache's Quarantine Management Plan requirements. • All activity personnel are aware of Apache's quarantine requirements.
Waste management	• Hazardous and non-hazardous wastes are segregated and stored in line with VI requirements and Apache's Waste Management Plan; • PFW and well fluids are disposed of through the production and PFW injection

	systems; • Hard piping is used in preference over flexible hoses for disposal of treated seawater in the bund; • Waste water disposal activities into the bund and CPI are monitored by site personnel.
Chemical and hydrocarbon management	• All chemicals and hydrocarbons used during the activity are stored in bunded areas; • SDS's are available on site for all chemicals used during the activity; • All hydrocarbon containing equipment is operated within secondary containments; • Drip trays are used under fuel points and valves; • Equipment refuelling activities adhere to Apache's Refuelling and Chemical Transfer Management Procedure; • No refueling of equipment is carried out after dark; • Draining of PFW pipeline prior to well intervention is carried out during daylight hours only; • In the event of a spill, take all actions to control the spill; • Ensure spill management equipment / spill kits are available at the activity location; • Report all spills > 80 L to DMP within 2 hours either directly by contacting the DMP Duty Inspector on 0419 960 621 and emailed to petroleum.environment@dmp.wa.gov.au or via the Apache Perth office. • Report all spills (including < 80 L) through Apache incident reporting system. • All spills < 80 L are Recordable Incidents and must be reported to DMP by email (petroleum.environment@dmp.wa.gov.au) no later than 15 days after the end of the calendar month by the Apache Environment Manager.
Artificial light management	• Night time lighting operations adhere to Apache's VI Lighting Management Plan; • Night time lighting will not exceed 2 nights.
Operational Environmental Awareness	Through on-line inductions and educational material present on Varanus Island, all personnel are familiar with the environmental requirements of the VI Hub Operations Environment Plan and the Rosette-1 Bridging Document to ensure these guidelines and procedures are being followed.

8. CONSULTATION

As the proposed activities occur within the Lease area on Varanus Island consultation with external stakeholders (apart from Joint Venture Partners and DER) was deemed not to be required as no non-government stakeholders are potentially affected by the activity.

Updates on activities around all Apaches facilities are also provided to stakeholders on a quarterly basis, with the last one being provided in December 2013.

9. CONTACT DETAILS

Further information about the well suspension activities can be obtained from:

Libby Howitt
Deputy Environment Manager
Apache Energy Limited
100 St Georges Terrace, Perth, Western Australia, 6000
Phone: 08 6218 7181
Email: libby.howitt@apachecorp.com

Appendix A – Chemical Disclosure

A. SYSTEM DETAILS:

OPERATOR:	APACHE
PROJECT / WELL:	ROSETTE 01
SYSTEM:	Water Injection
TOTAL VOLUME OF SYSTEM:	1300.2m^3

B. PRODUCT LIST

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS attached
Cementing Chemicals					
Fresh water	Water supplied by Apache	Mix water	27.1%	Natural ingredient	N/A
G cement	Adelaide Brighton Cement	CEMENTING	67.8%	CONSTITUENT 1: Static Acute Aquatic Toxicity- Freshwater and Marine Fish:- 96 hour LC50: >1,500 mg/L Static Acute Aquatic Toxicity -Freshwater and Marine Invertebrates:- 48 hour LC50: >1,000 mg/L Static Acute Aquatic Toxicity - Freshwater and Marine Algae:- 72 hour EC50: >1,000 mg/L Partition Coefficient, n-Octanol/Water: Not Applicable for inorganics Oxygen Demand, Chemical Oxygen Demand: Not Applicable for inorganics Biodegradability, Seawater – Indigenous microbes: Not Applicable for inorganics CONSTITUENT 2 Carcinogenicity: Classified as a human carcinogen (IARC Group 1) CONSTITUENT 3 Carcinogenicity: Confirmed human carcinogen (IARC Group 1) Health Surveillance: Required [NOHSC:1005(1994)]	Yes
NF-6	Halliburton Australia Pty Ltd	Cement Defoamer	0.1%	CONSTITUENT 1: Acute Fish Toxicity 96h LC50: >3200 mg/L (*Scophthalmus maximus*); Acute Crustacean Toxicity 48h LC50: 2500 mg/L (*Acartia tonsa*); Acute Algae Toxicity 72h EC50: 991.02 mg/L (*Skeletonema costatum*) CONSTITUENT 2: Acute Fish Toxicity 96h LC50: >1800 mg/L (*Scophthalmus maximus*); Acute Crustacean Toxicity 48h LC50: >10000 mg/L (*Acartia tonsa*);	Yes

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS attached
				Acute Algae Toxicity 72h EC50: 41 mg/L (*Skeletonema costatum*) CONSTITUENT 3: Acute Fish Toxicity 96h LC50: >5600 mg/L (*Scophthalmus maximus*); Acute Crustacean Toxicity 48h LC50: 5085.71 mg/L (*Acartia tonsa*); Acute Algae Toxicity 72h EC50: 6488.87 mg/L (*Skeletonema costatum*) CONSTITUENT 4: Acute Fish Toxicity 96h LC50: >5600 mg/L (*Scophthalmus maximus*); Acute Crustacean Toxicity 48h LC50: >10000 mg/L (*Acartia tonsa*); Acute Algae Toxicity 72h EC50: >3200 mg/L (*Skeletonema costatum*) RAPE OIL: (8002-13-9): Acute Fish Toxicity 96h LC50: >5600 mg/L (*Scophthalmus maximus*); Acute Crustacean Toxicity 48h LC50: >10000 mg/L (*Acartia tonsa*); Acute Algae Toxicity 72h EC50: >3200 mg/L (*Skeletonema costatum*)	
Gascon 469	Halliburton Australia Pty Ltd	Cement Free-Fluid Control	1.5%	CONSTITUENT 1: PLONOR; LD50 (oral rat) >15000 mg/kg CONSTITUENT 2: Included on the OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment.	Yes
Halad-413L	Halliburton Australia Pty Ltd	Cement Fluid-Loss Control	3%	CONSTITUENT 1: Algae: EC50 (72h): 1,102 mg/L (*Skeletonema costatum*); Crustacean: LC50 (48h): >2,000 mg/L (*Acartia tonsa*); Fish: LC50(96h): >1,000 mg/L (*Scophthalmus maximus* juvenile); Log Pow: <0 – 3.5 9 (OECD 117) Biodegradation (28 Days): 6.1% (OECD 306)	Yes
SCR-100L	Halliburton Australia Pty Ltd	Cement Retarder	0.5%	CONSTITUENT 1: Biodegradation(28 Days): 39% (OECD306); Algae: EC50(72h): >3300 mg/l (*Skeletonema costatum*); Crustacean: LC50(48h): >2000 mg/l (*Acartia tonsa*); Fish: LC50(96h): > 1000 mg/l (*Scophthalmus maximus* juvenile) CONSTITUENT 2: LC50; Species: *Americamysis bahia* (Opossum shrimp); Conditions: flow through; Concentration: 2.7 ppm for 96 hr EC50; Species: *Crassostrea virginica* (American oyster); Conditions: static; Concentration: 2.67 ppm for 96 hr LC50; Species: *Cyprinodon variegatus* (Sheepshead minnow); Conditions: flow through; Concentration: 8.3 ppm for 96 hr LC50; Species: *Cyprinodon variegatus* (Sheepshead minnow); Conditions: static;	Yes

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS attached
				Concentration: 17 ppm for 96 hr LC50; Species: *Lepomis macrochirus* (Bluegill); Conditions: freshwater, static; Concentration: 29000 ug/L for 96 hr Bioaccumulation: an estimated BCF of five(SRC), from an estimated log Kow of 1.63(5) and a regression-derived equation(6), suggests the potential for bioconcentration in aquatic organisms is low(SRC) CONSTITUENT 2: Fish acute toxicity: LC50 (24 h): 1126 mg/L (*Oncorhynchus gorbuscha*) Crustacean acute toxicity: EC50 (immobility) (48 h): >97 mg/L (*Daphnia magna*)	
Total			~100%		
Treated seawater					
Seawater	Locally sourced	Carrier fluid	99.97%	N/A	N/A
XC24380	Baker Petrolite	Biocide - preservation	0.03%	**BIODEGRADABILITY** 70% - readily – 21 days; **ACUTE AQUATIC TOXICITY:** Marine Fish Sheepshead minnow: 96 hr. LC50: 72 mg/L Marine Algae *Acartia tonsa*: 48 hr. EC50: 0.6 mg/L Marine crustaceans *Skeletonema costatum*: 48 hr. EC50: 0.2 mg/L	Yes
Total			~100%		
Gas conditioning chemical					
MEG	Baker Huges	Hydrate prevention	0.068%	**Toxicological** Oral LD 50 (rat): 4,700 mg/kg **AQUATIC TOXICITY** Flathead minnow (*Pimephales promelas*) 96hrs LC50: >10,000 mg/L Water flea (*Daphnia magna*) 96hr LC50: >10,000 mg/L Rainbow trout (*Oncorhynchus mykiss*) 96hr LC50: >10,000 mg/L Algae (*Skeletonema costatum*) 96hr EC50 >1000 <5000 mg/L Low bioaccumulation potential (Log Pow: -0.75 – 1.17) Readily biodegradable (93% in 28 days)	Yes

Trade name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity Info	MSDS attached
PFW	Apache	Disposal fluid	99.932%	N/A	
Total			~100%		

C. CHEMICAL LIST

Chemicals within products in Part B	CAS number	Mass fraction (%)
WATER	7732-18-5	99.4
PORTLAND CEMENT	65997-15-1	0.0092
CRYSTALLINE SILICA / QUARTZ	14808-60-7	0.00028
SODIUM HYDROXIDE	1310-73-2	<0.0001
AMORPHOUS SILICA, FUMED	7631-86-9	0.00007
ACRYLIC ACID POLYMER WITH SODIUM AMPS, SODIUM SALT	37350-42-8	0.00007
2-BROMO-2-(BROMOMETHYL)PENTANEDINITRILE	35691-65-7	<0.0001
FD&C BLUE 1	3844-45-9	<0.0001
MONOPROPYLENE GLYCOL MONOOELEATE	1330-80-9	<0.0001
SORBITAN, MONOPALMITATE	26266-57-9	<0.0001
ALUMINIUM STEARATE	637-12-7	<0.0001
RAPE OIL	8002-13-9	<0.0001
HUMIC ACIDS, SODIUM SALTS, POLYMERS	473268-27-8	0.00014
PHOSPHONIUM QUATERNARY SALT	55566-30-8	0.0225
ETHYLENE GLYCOL	107-21-1	0.0270
Total		~100%

Appendix B - Chemical SDS

Baker Petrolite

SAFETY DATA SHEET

XC24380

1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME XC24380

PRODUCT NO. XC24380

APPLICATION Biocide

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

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

Harmful if swallowed. Toxic by inhalation. Risk of serious damage to eyes. May cause sensitisation by skin contact. May cause harm to the unborn child. Very toxic to aquatic organisms.

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE (According to criteria of NOHSC). 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 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). Avoid exposure - obtain special instructions before use. Use appropriate containment to avoid environmental contamination. Avoid release to the environment. Refer to special instructions/safety data sheets. Restricted to professional users.

DG CLASS

Class 6.1: Toxic substances.

PACKING GROUP III

UN NO. 2810

HAZCHEM CODE 2X

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
PHOSPHONIUM QUATERNARY SALT	259-709-0	55566-30-8	60-100%	T;R23. Rep 1;R61. Xn;R22. Xi;R41. N;R50. R43.

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

4 FIRST-AID MEASURES

INHALATION
Remove victim immediately from source of exposure. Provide rest, warmth and fresh air. Get medical attention without delay. Place under medical observation. 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. Get medical attention promptly if symptoms occur after washing.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA
Fire can be extinguished using: Water spray, fog or mist. Alcohol resistant foam. Dry chemicals, sand, dolomite etc.

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.

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

7 HANDLING AND STORAGE

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

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.

STORAGE CLASS
Toxic 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
Use chemical cartridge protection with appropriate cartridge. Chemical respirator with organic vapour cartridge.

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.

OTHER PROTECTION
Wear appropriate clothing to prevent repeated or prolonged skin contact. 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
ODOUR	Pungent
SOLUBILITY	Soluble in water
MELTING POINT (°C)	-43°C
RELATIVE DENSITY	Typically 1.390 @ 20°C
pH-VALUE, CONC. SOLUTION	Typical range: 3 - 6
VISCOSITY	Approx. 30 cSt @ 25°C
PARTITION COEFFICIENT (N-Octanol/Water)	Log Pow = -9.8 (Calculated)

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 reducing agents. Strong alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS
Vapours/gases/fumes of: Phosphine (PH3). Oxides of: Carbon. Phosphorus. Sulphur.

11 TOXICOLOGICAL INFORMATION

INHALATION
Toxic by inhalation. Exposure may result in eye, nose and respiratory irritation, and may produce nausea, headache and dizziness.

INGESTION
Harmful if swallowed. Corrosive. Causes severe irritation or burns to the mouth and digestive tract.

SKIN CONTACT
Corrosive. Contact with skin will produce severe irritation or burns with possible in-depth injury. Repeated skin contact may produce allergic sensitisation. In such cases further contact may cause allergic rashes.

EYE CONTACT

Corrosive. Contact with eyes will cause permanent damage if not immediately removed.

HEALTH WARNINGS

May cause harm to the unborn child

Other Health Effects

Toxic to Reproductive Health Categ. 3.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Very toxic to aquatic organisms.

BIOACCUMULATION

The product is not expected to bioaccumulate.

DEGRADABILITY

The product is biodegradable.

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	TOXIC LIQUID, ORGANIC, N.O.S. (contains tetrakishydroxymethylphosphonium sulphate)
UN NO.	2810
DG CLASS	Class 6.1: Toxic substances.
PACKING GROUP	III
HAZCHEM CODE	2X
UN NO. SEA	2810
IMDG CLASS	6.1
IMDG PACK GR.	III
MARINE POLLUTANT	No.
UN NO. AIR	2810
AIR CLASS	6.1
AIR PACK GR.	III
HAZCHEM CODE	2X

15 REGULATORY INFORMATION

LABELLING

XC24380

Toxic

Dangerous for the environment

CONTAINS PHOSPHONIUM QUATERNARY SALT

RISK PHRASES

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

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.
S37/39	Wear suitable 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).
S53	Avoid exposure - obtain special instructions before use.
S57	Use appropriate containment to avoid environmental contamination.
S61	Avoid release to the environment. Refer to special instructions/safety data sheets.
P11	Restricted to professional users.

POISONS SCHEDULE NUMBER S6

NATIONAL REGULATIONS AND REFERENCES

National Code of Practice for the Storage and Handling of Workplace Dangerous Goods. National Code of Practice for the Preparation of Material Safety Data Sheets. National Standard 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, 11, 15, and 16

REVISION DATE 30/03/2007

RISK PHRASES IN FULL

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

Product Data

Baker Petrolite

XC24380

Biocide

DESCRIPTION:

XC24380 biocide is a concentrated broad spectrum biocide, particularly effective against sulfate reducing bacteria (SRB), which can be used in both acid and alkaline conditions. **XC24380 biocide** contains a new generation active ingredient which has many advantages over traditional industrial biocides. This product will control bacteria in water floods, oil and gas pipelines, drilling muds, packer fluids, and completion and workover fluids.
XC24380 biocide has an unusually good toxicity profile for an industrial biocide and has been shown to be readily biodegradable. It can also be easily deactivated under controlled conditions. These properties result in safer handling and reduced environmental impact, two important factors to consider in selecting a biocide.

APPLICATION:

XC24380 biocide is recommended for use in controlling sulfate-reducing bacteria and general aerobic bacteria, including microorganisms that contribute to biofilm formation in oilfield recovery, processing and distribution applications and supporting systems. This includes injection water, water holding tanks, disposal well water, recirculating water handling systems and pipelines.

XC24380 biocide is also effective for use in controlling microbial growth in fluids used for drilling and stimulation of oil wells. A Baker Petrolite Chemicals sales representative will make specific recommendations for your system.

Water Floods: **XC24380 biocide** should be added to a water flood system at a point where uniform mixing will occur.

Initial Treatment: For a noticeably fouled system, add 93-350 ppm XC24380 biocide. When added to a flowing system, slug dose for 2-6 hours based on flow rates. Repeat as necessary until control is achieved.

Subsequent Treatment: Once control has been achieved, add 14-98 ppm XC24380 biocide weekly or as needed to maintain control. When added to a flowing system, slug dose for 2-6 hours based on flow rates.

Continuous Treatment: XC24380 biocide can be dosed continuously at a level of 14-67 ppm. Oil and Gas Pipelines: X-CIDE 575 biocide should be added at a point in the pipeline where uniform mixing will occur. Slug Dosing: Follow instructions for water flood treatment.

Continuous Dosing: XC24380 biocide can be dosed continuously at a level of 14-100 ppm.

Drilling Muds, Packer Fluids, Completion and Workover Fluids: XC24380 biocide should be added to these fluids at a point where uniform mixing will occur. Add 33-1400 ppm XC24380 biocide to a freshly prepared fluid depending on severity of contamination.

TYPICAL PROPERTIES:

Form	Clear colorless liquid
Specific Gravity @ 20°C	1.39
Flash Point	Non Flammable
pH (conc solution)	4.0 (typical)
Solubility	Water soluble

FEATURES & BENEFITS:

Features:
- Not effected by total dissolved solids and high brine composition

Benefits:
- Can be used in a wide range of brines

Feature:
- Rapidly biodegradable

Benefit:
- Discharge permits usually granted

Feature:
- Will not react with H_2S

Benefit:
- Can be used in sour water

Feature:
- Effective against sulfate reducing bacteria at low concentrations

Benefit:
- Reduces microbially influenced corrosion and biogenic H_2S production

Feature:
- Reservoir compatible

Benefit:
- Can be applied by squeeze application

Feature:
- Compatible with polymers

Benefit:
- Can be used to preserve EOR polymers, well stimulation and drilling fluids

Feature:
- Effective against acid producing bacteria (APB)

Benefit:
- Reduces microbially influenced corrosion

MATERIAL COMPATABILITY::

Suitable:

Metals:	stainless steel, aluminum
Plastics:	PVC, nylon, PTFE polyethylene, polypropylene, polyurethane
Elastomers:	silicon rubber, VITON®, nitrile rubber, natural rubber

Not Suitable:

Metals:	copper, brass, mild steel, cast iron, zinc

SAFETY & HANDLING:

Before handling, storage or use, see the Material Safety Data Sheet (MSDS) for details.

24 Hour Emergency Hotline:

Australia: **1800-033-111 (Orica ERS)**

International: **+1 703-527-3887 (CHEMTREC)**

Baker Petrolite Customer Hotline:

1-800-020-115 (8 a.m. to 5 p.m. AEST)

Environmental Data

Baker Petrolite

XC24380

AQUATIC TOXICOLOGY

PARAMETERS	RESULTS	VALUES
Static Acute Saltwater Toxicity		
Species: Skeletonema Costatum	Effective concentration 50%, 72 hours	**0.16 mg/L**
(Crustacean Toxicity)	No Effect Concentration, 72 hours	**No Data**
Species: Acartia Tonsa	Lethal Concentration 50%, 48 hours	**0.60 mg/L**
(Algae Toxicity)	No Effect Concentration, 48 hours	**No Data**
Species: Sheepshead Minnow	Lethal Concentration 50%, 96 hours	**72 mg/L**
(Fish Toxicity)	No Effect Concentration, 96 hours	**No Data**
Species: Juvenile Plaice	Lethal Concentration 50%, 96 hours	**86 mg/L**
(Fish Toxicity)	No Effect Concentration, 96 hours	**No Data**
Species: Brown Shrimp	Lethal Concentration 50%, 48 hours	**340 mg/L**
(Crustacean Toxicity)	No Effect Concentration, 48 hours	**No Data**
Species: Mysid Shrimp	Lethal Concentration 50%, 96 hours	**7.3 mg/L**
(Crustacean Toxicity)	No Effect Concentration, 96 hours	**No Data**

Environmental Data

Baker Petrolite

XC24380

CHEMICAL FATE

Octanol/Water Partition Coefficient
Method: OECD117 Log Pow <0

ENVIRONMENTAL FATE

Ready Biodegradability

While standard ready biodegradability studies cannot be performed on THPS due to its biocidal properties, data indicate that THPS is inherently biodegradable at subcidal levels. In addition, radio-labelled THPS was used to monitor CO2 evolution of sub-lethal concentrations of the active. Aerobic aquatic metabolism studies indicate a 60% reduction of 14C-THPS within 7 days while anaerbobic aquatic metabolism studies demonstrate greater than 60% reduction of 14C-THPS after 28 days.

As defined by the US EPA, FIFRA 40 CFR, Part 158, Subdivision N, Series 162-4, the active ingredient in XC24380 is considered to be readily biodegradable.

Material Safety Data Sheet

MEG WATER 90:10

1 . Identification of the material and supplier

Names

Product name : MEG WATER 90:10

Product code : MEGWATER9010

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 : Not available

2 . Hazards identification

Classification : Xn; R22

Risk phrases : R22- Harmful if swallowed.

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

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
ethanediol	107-21-1	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%.

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 : 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. Get medical attention. 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. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if irritation occurs.

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.

4 . First-aid measures

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:
carbon dioxide
carbon monoxide

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).

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

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.

8 . Exposure controls/personal protection

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 : Colourless.

Odour : Faint odour.

Melting point : <-13°C (<8.6°F)

Relative density : 1.065 to 1.135 (25°C)

Flash point : Closed cup: Not applicable. [Pensky-Martens.]

pH : 8.5

Viscosity : Kinematic (40°C (104°F)): <0.1 cm^2/s (<10 cSt)

Solubility : Easily soluble in the following materials: cold 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 : Harmful if swallowed.

Skin contact : No known significant effects or critical hazards.

Eye contact : No known significant effects or critical hazards.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure

11 . Toxicological information

ethanediol	LD50 Dermal	Rabbit	9530 uL/kg	-
	LD50 Oral	Rat	4700 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
ethanediol	Eyes - Mild irritant	Rabbit	-	-	-
	Eyes - Moderate irritant	Rabbit	-	-	-
	Skin - Mild 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 : No specific data.

Skin : No specific data.

Eyes : No specific data.

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 : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
ethanediol	Acute LC50 >18500 mg/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
ethanediol	-	-	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 : Xn; R22

Risk phrases : R22- Harmful if swallowed.

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 : 10 January 2013.

Date of issue/ Date of revision : 10 January 2013

Date of previous issue : No previous validation

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.

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **CEMENT - CLASS G**

Revision Date: 29-Apr-2013

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

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier

Halliburton Australia Pty. Ltd.
15 Marriott Road
Jandakot
WA 6164
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: CEMENT - CLASS G
Synonyms: None
Chemical Family: Cement
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None Allocated
Poisons Schedule: None Allocated
Application: Cement

Prepared By

Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand WES	ACGIH TLV-TWA
Portland cement	65997-15-1	60 - 100%	TWA: 10 mg/m^3	TWA: 10 mg/m^3	TWA: 1 mg/m^3
Crystalline silica, quartz	14808-60-7	<3	TWA: 0.1 mg/m^3	TWA: 0.2 mg/m^3	TWA: 0.025 mg/m^3

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD
May cause eye, skin, and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD
Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

Risk Phrases

R41 Risk of serious damage to eyes.
R43 May cause sensitization by skin contact.
R37/38 Irritating to respiratory system and skin.

HSNO Classification

6.1E (Inhalation) Acutely Toxic Substances 8.2C Corrosive to dermal tissue if exposed for greater than 1 hour 8.3A Corrosive to ocular tissue 6.5B Contact sensitisers 6.7A Known or presumed human carcinogens 6.9A Toxic to human target organs or systems

4. FIRST AID MEASURES

Inhalation

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

Skin

Wash with soap and water. Get medical attention if irritation persists.

Eyes

In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion

Under normal conditions, first aid procedures are not required.

Notes to Physician

Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

None - does not burn.

Extinguishing media which must not be used for safety reasons

None known.

Special Exposure Hazards

Not applicable.

Special Protective Equipment for Fire-Fighters

Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures

Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures	None known.
Procedure for Cleaning / Absorption	Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Store in a cool well ventilated area. Keep container closed when not in use. Store locked up. Store in a cool, dry location. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Product has a shelf life of 24 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149 (FFP2/FFP3), or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Gray
Odor:	Odorless
pH:	12.4
Specific Gravity @ 20 C (Water=1):	3.14
Density @ 20 C (kg/l):	Not Determined
Bulk Density @ 20 C (kg/m^3):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m^3):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m^3):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	0
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Not Determined
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data: Stable

Hazardous Polymerization: Will Not Occur

Conditions to Avoid Keep away from any contact with water.

Incompatibility (Materials to Avoid) Hydrofluoric acid.

Hazardous Decomposition Products Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).

Additional Guidelines Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Sympotoms related to exposure

Inhalation Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

Skin Contact Can dry skin. May cause an allergic skin reaction. May cause alkali burns with confined contact.

Eye Contact May cause severe eye irritation.

Ingestion None known

Aggravated Medical Conditions Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects/Carcinogenicity

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined

Persistence/Degradability Not applicable

Bio-accumulation Not determined

Ecotoxicological Information

Acute Fish Toxicity: Not determined
Acute Crustaceans Toxicity: Not determined

Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Bury in a licensed landfill according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.
Contaminated Packaging	Follow all applicable national or local regulations. Contaminated packaging may be disposed of by: rendering packaging incapable of containing any substance, or treating packaging to remove residual contents, or treating packaging to make sure the residual contents are no longer hazardous, or by disposing of packaging into commercial waste collection.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	All components listed on inventory or are exempt.
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS
Classification	Xi - Irritant.
Risk Phrases	R41 Risk of serious damage to eyes. R43 May cause sensitization by skin contact. R37/38 Irritating to respiratory system and skin.

Safety Phrases

S2 Keep out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37 Wear suitable gloves.
S24/25 Avoid contact with skin and eyes.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **GASCON 469**

Revision Date: 01-Feb-2012

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

Statement of Hazardous Nature Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier

Halliburton Australia Pty. Ltd.
53-55 Bannister Road
Canning Vale
WA 6155
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: GASCON 469
Synonyms: None
Chemical Family: Blend
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Cement Additive

Prepared By

Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Sodium hydroxide	1310-73-2	< 1	2 mg/m^3	Not applicable	2 mg/m^3
Silica, amorphous - fumed	7631-86-9	10 - 30%	2 mg/m^3	Not applicable	2 mg/m^3

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye and skin irritation.

Risk Phrases

R36/38 Irritating to eyes and skin.

HSNO Classification

6.1E Acutely Toxic Substances
6.3A Substances that are irritating to the skin.
6.4A Substances that are irritating to the eye.

4. FIRST AID MEASURES

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

Skin Wash with soap and water. Get medical attention if irritation persists.

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media All standard fire fighting media

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

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing. Avoid breathing vapors.

Storage Information	Store in a cool well ventilated area. Keep from excessive heat. Keep from freezing. Keep container closed when not in use. Store in non-rusting containers. Product has a shelf life of 12 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.
Respiratory Protection	Dust/mist respirator. (95%)
Hand Protection	Impervious rubber gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Transparent
Odor:	Odorless
pH:	10
Specific Gravity @ 20 C (Water=1):	1.1
Density @ 20 C (kg/l):	1.098
Bulk Density @ 20 C (kg/m^3):	Not Determined
Boiling Point/Range (C):	100
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m^3):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m^3):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	80
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	10
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers. Strong acids.

Hazardous Decomposition Products	None known.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation.
Skin Contact	May cause skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	Irritation of the mouth, throat, and stomach.
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	LD50: > 15000 mg/kg (Rat)
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Ames Test: Negative

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed on inventory or are exempt.
US TSCA Inventory All components listed on inventory or are exempt.
EINECS Inventory This product, and all its components, complies with EINECS

Classification Xi - Irritant.

Risk Phrases

R36/38 Irritating to eyes and skin.

Safety Phrases

S24/25 Avoid contact with skin and eyes.

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **HALAD® 413L CEMENT ADDITIVE**

Revision Date: 22-Feb-2012

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

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier

Halliburton Australia Pty. Ltd.
53-55 Bannister Road
Canning Vale
WA 6155
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substance or Preparation

Product Trade Name: HALAD® 413L CEMENT ADDITIVE
Synonyms: None
Chemical Family: Polymer
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Fluid Loss Additive

Prepared By

Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance	CAS Number	Percent	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Acrylic resin	Mixture	10 - 30%	Not determined	Not determined	Not applicable

Non-hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview	No significant hazards expected.
Risk Phrases	None
HSNO Classification	Non-hazardous

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	All standard fire fighting media
Unsuitable Extinguishing Media	None known
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use Appropriate protective equipment.
Environmental Precautionary Measures	None known.
Procedure for Cleaning/Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing.
Storage Information	Store away from oxidisers. Product has a shelf life of 24 months

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.

Respiratory Protection	If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Not normally needed. But if significant exposures are possible then the following respirator is recommended. Dust/mist respirator.
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Colour:	Brown-black
Odour:	Sweet
pH:	7.5
Specific Gravity @ 20 C (Water=1):	1.1
Density @ 20 C (kg/l):	1.098
Bulk Density @ 20 C (kg/l):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/m^3):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m^3):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapour Pressure @ 20 C (mmHg):	Not Determined
Vapour Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate = 1):	Not determined.
Solubility in Water (g/100ml):	Miscible
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerisation:	Will Not Occur
Conditions to Avoid	None anticipated

Incompatibility (Materials to Avoid)	Strong oxidisers.
Hazardous Decomposition Products	Oxides of nitrogen. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	None known.
Skin Contact	None known.
Eye Contact	None known.
Ingestion	None known
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	LD50: > 5000 mg/kg (Rat)
Dermal Toxicity:	LD50: > 2000 mg/kg (Rabbit)
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Draize Rating (Skin): 0.09/8.0 (Rabbit) Practically Non-irritating
Carcinogenicity:	Not determined
Genotoxicity:	Not determined
Reproductive/Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Slowly biodegradable
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Disposal should be made in accordance with federal, state and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory Product contains one or more components not listed on inventory.
US TSCA Inventory All components listed.
EINECS Inventory All components are listed on the inventory.

Classification Not Determined

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS:
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

Disclaimer Statement

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*****END OF MSDS*****

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **NF-6**

Revision Date: 01-Feb-2012

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

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier

Halliburton Australia Pty. Ltd.
53-55 Bannister Road
Canning Vale
WA 6155
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: NF-6
Synonyms: None
Chemical Family: Blend
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Defoamer

Prepared By

Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Vegetable oil		60 - 100%	10 mg/m^3	Not applicable	Not applicable
Aluminum stearate	637-12-7	1 - 5%	10 mg/m^3	Not applicable	2 mg/m^3

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview	May cause mild eye, skin, and respiratory irritation. May be harmful if swallowed.
Risk Phrases	None
HSNO Classification	9.1D Substances that are slightly harmful in the aquatic environment.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.
Notes to Physician	Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Carbon dioxide, dry chemical, foam.
Extinguishing media which must not be used for safety reasons	None known.
Special Exposure Hazards	Use water spray to cool fire exposed surfaces. Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors.
Storage Information	Store away from oxidizers. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.
Respiratory Protection	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Organic vapor respirator with a dust/mist filter.
Hand Protection	Polyvinylchloride gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Yellow
Odor:	Mild
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	0.93
Density @ 20 C (kg/l):	0.93
Bulk Density @ 20 C (kg/m^3):	Not Determined
Boiling Point/Range (C):	182
Freezing Point/Range (C):	Not Determined
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	>170
Flash Point Method:	Not Determined
Autoignition Temperature (C):	385
Flammability Limits in Air - Lower (g/m^3):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m^3):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Disperses
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None known.
Incompatibility (Materials to Avoid)	Strong oxidizers.

Hazardous Decomposition Products	Hydrocarbons. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	None known.
Skin Contact	May cause skin irritation. May cause an allergic skin reaction.
Eye Contact	May cause eye irritation.
Ingestion	May cause abdominal pain, vomiting, nausea, and diarrhea.
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Readily biodegradable
Bio-accumulation	Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory All components listed on inventory or are exempt.
US TSCA Inventory All components listed on inventory or are exempt.
EINECS Inventory This product, and all its components, complies with EINECS

Classification Not Classified

Risk Phrases None

Safety Phrases None

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **SCR-100L**

Revision Date: 22-Feb-2012

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

Statement of Hazardous Nature Non-Hazardous according to the criteria of NOHSC, Non-Dangerous Goods according to the criteria of ADG.

Manufacturer/Supplier

Halliburton Australia Pty. Ltd.
53-55 Bannister Road
Canning Vale
WA 6155
Australia

ACN Number: 009 000 775
Telephone Number: 61 (08) 9455 8300
Fax Number: 61 (08) 9455 5300

Product Emergency Telephone
Australia: 08-64244950
Papua New Guinea: 05 1 281 575 5000
NewZealand: 06-7559274

Fire, Police & Ambulance - Emergency Telephone
Australia: 000
Papua New Guinea: 000
New Zealand: 111

Identification of Substances or Preparation

Product Trade Name: SCR-100L
Synonyms: None
Chemical Family: Anionic Polymer
UN Number: None
Dangerous Goods Class: None
Subsidiary Risk: None
Hazchem Code: None
Poisons Schedule: None
Application: Retarder

Prepared By

Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	Australia NOHSC	New Zealand OEL	ACGIH TLV-TWA
Contains no hazardous substances	Mixture	60 - 100%	Not applicable	Not applicable	Not applicable

Non-Hazardous Substance to Total of 100%

3. HAZARDS IDENTIFICATION

Hazard Overview	May cause eye irritation.
HSNO Classification	Non-hazardous

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.
Ingestion	Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.
Notes to Physician	Not Applicable

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	All standard fire fighting media
Extinguishing media which must not be used for safety reasons	None known.
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing.
Storage Information	Store away from oxidizers. Store in a dry location. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.

Respiratory Protection	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Dust/mist respirator. (95%)
Hand Protection	Impervious rubber gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Blue
Odor:	Odorless
pH:	3 - 4 (28%)
Specific Gravity @ 20 C (Water=1):	1.16
Density @ 20 C (kg/l):	1.16
Bulk Density @ 20 C (kg/m^3):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	-4
Pour Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined**Min:** > 93
Flash Point Method:	PMCC
Autoignition Temperature (C):	520
Flammability Limits in Air - Lower (g/m^3):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/m^3):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	~60
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	15-30 (25C)
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Oxides of nitrogen. Oxides of sulfur. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Inhalation May cause respiratory irritation.

Skin Contact May cause skin irritation.

Eye Contact May cause eye irritation.

Ingestion Irritation of the mouth, throat, and stomach.

Aggravated Medical Conditions Skin disorders.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 1% are chronic health hazards.

Other Information None known.

Toxicity Tests

Oral Toxicity: Not determined

Dermal Toxicity: Not determined

Inhalation Toxicity: Not determined

Primary Irritation Effect: Not determined

Carcinogenicity Not determined

Genotoxicity: Not determined

Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined

Persistence/Degradability Not determined

Bio-accumulation Not determined

Ecotoxicological Information

Acute Fish Toxicity: Not determined
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

Chemical Inventories

Australian AICS Inventory	All components listed on inventory or are exempt.
New Zealand Inventory of Chemicals	This product does not comply with NZIOC
US TSCA Inventory	All components listed on inventory or are exempt.
EINECS Inventory	This product, and all its components, complies with EINECS
Classification	Not Classified
Risk Phrases	Not classified
Safety Phrases	Not classified

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Contact

Australian Poisons Information Centre
24 Hour Service: - 13 11 26
Police or Fire Brigade: - 000 (exchange): - 1100

New Zealand National Poisons Centre
0800 764 766

Additional Information For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

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*****END OF MSDS*****