



Harriet Alpha, Bravo and Charlie Slickline and Temporary Well Suspension Activities Bridging Document Summary

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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 temporary well suspension and pumping programs (slick lining / coiled tubing) in permit area TL/1 on three adjoining facilities – Harriet Alpha, Bravo and Charlie – in Western Australian (WA) State waters as part of the planned phased mothballing operations of the HA and HC platforms.

The Harriet Alpha, Bravo and Charlie platforms are located within the Varanus Island hub. The Hub is operated by Apache Northwest Pty Ltd (Apache), on behalf of the Joint Venture partners. Production wells associated with the Harriet Alpha, Bravo and Charlie platforms have been used since 1989.

The objective of the activities is to perform temporary well suspensions using well kill (pumping), slickline set tubing plug installation work and/or coiled tubing cementing work on Harriet production wells. In addition, slickline will be used on the Bambra-08 production well at Harriet Bravo platform for gas optimisation work.

Each platform activity is expected to take between 1 and 4 weeks to complete; activities will likely be staggered and therefore are unlikely to run back-to-back. Activities are currently scheduled to commence in March 2014, pending suitable weather windows, and will be completed by end December 2015.

1.1 Compliance

The Harriet Alpha, Bravo and Charlie Slickline and Temporary Well Suspension Bridging Document (BD) was prepared for the proposed activities and the DMP determined on the 21 February 2014 (E0001/201401, APACHE, EARS 45652) that the BD meets the requirements of Regulation 11(1) of the *Petroleum (Submerged Lands) (Environment) Regulations 2012* (P(SL)(E) Regulations). Revisions of the BD were submitted on 14 March 2014, 07 October and 06 November. The current BD was accepted on 10 November 2014. The well suspension / coiled tubing activities 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 Regulation 11(7) of the (P(SL)(E) Regulations and section 2.4 of the DMP *Guidelines for the Preparation and Submission of an EP*.

The proposed well suspension campaigns will be managed in accordance with the accepted Varanus Island Hub Operations EP (EA-60-RI-186) and the Harriet Alpha, Bravo and Charlie Slickline and Temporary Well Suspension Bridging Document (Document Number SP-14-RG-048) as they cover the expected environmental risks and control measures to be undertaken.

2. LOCATION OF THE ACTIVITY

The surface location of the Harriet Alpha, Bravo and Charlie platforms are shown in **Figure 1** and the location coordinates (GDA94 Zone 50) are provided in **Table 1** below.

Table 2-1: Location of the Harriet Alpha, Bravo and Charlie Platforms

| Platform | Longitude | Latitude |
|-----------------|----------------------|----------------------|
| Harriet Alpha | 115° 36' 51.07" East | 20° 36' 07.78" South |
| Harriet Bravo | 115° 38' 15.28" East | 20° 34' 30.71" South |
| Harriet Charlie | 115° 37' 38.03" East | 20° 35' 20.52" South |

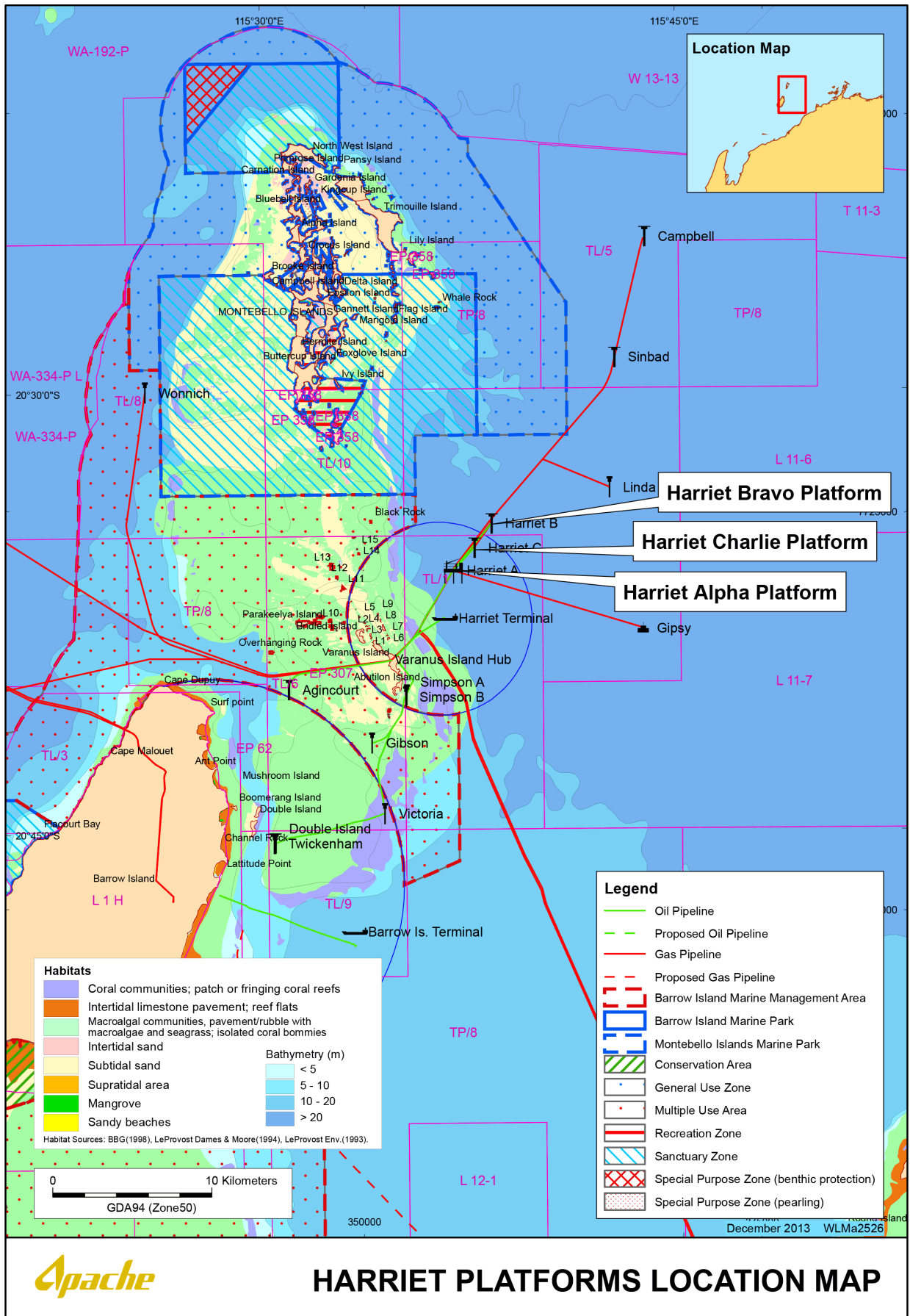


Figure 1: Location of Harriet Alpha, Bravo and Charlie platforms and surrounding sensitive habitats

3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Physical and biological environment

A full description of the existing environment is provided in the Varanus Island Hub Operations Environment Plan. A summary of the key features and sensitivities is provided below.

The Harriet Alpha, Bravo and Charlie platforms are 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.

Regional surveys on the NWS indicate the seafloor composition is uniform throughout the area, but with spatial variation in the grain size and origin of the surface sediments. The seabed immediately around the Harriet Alpha, Bravo and Charlie platforms is similarly flat and featureless with medium to coarse sand with some gravel, **Figure 1** illustrates environmentally sensitive habitats around the Harriet Alpha, Bravo and Charlie platforms.

The proposed activities may overlap with a number of key ecological events including dugong breeding, turtle nesting and humpback whale migration. As the proposed activities will be carried out during daylight only and on the platforms, it is not expected that the marine environment or their sensitive features will be impacted from these activities.

3.2 Socio-economic environment

The standard 500 m exclusion zone to non-Apache vessels will be maintained around the Harriet Alpha, Bravo and Charlie platforms during the activities. Therefore the proposed activities are not expected to interfere with other users of the sea.

4. ACTIVITY DESCRIPTION

Suspension of 6 wells on Harriet Alpha and 4 wells on Harriet Charlie platforms will be achieved by isolating the reservoir by setting a single deep set slick line plug or cement plug within the tubing. Once the tubing plug has been tested the tubing, production and intermediate annuli will be topped up with inhibited sea water leaving the wells hydrocarbon free. The wells will remain suspended until a future date of full abandonment.

Several slickline campaigns may be required on one or several of the wells if a previous campaign is unsuccessful in isolating the reservoir. The use of wireline tools (loggers, gauges, camera etc.) may also be required during a well specific campaign.

Gas lift optimisation on Bambra-8 well on Harriet Bravo will be achieved by verifying the condition of the existing gas lift mandrels/valves utilising slickline and replacing where necessary.

During slickline and coiled tubing activities, a transfer submersible pump will pump seawater to the platform. All seawater pumped into the wells will be dosed with the Baker Petrolite product XC24380 at a level of 0.3 litres per 1,000 litres (i.e. 300 ppm). Only raw seawater will be overflowed during the operation.

Estimated seawater and biocide volumes are based on displacing up to three tubing and open hole volumes into each well's reservoir. The chemical will be shipped to location in a 1,000 L ISO and stored within the platforms' chemical bund area.

5. CHEMICAL DISCLOSURE AND MANAGEMENT

The biocide and hazardous cementing chemicals will be stored within the chemical bund area of the platforms. Apache's Refuelling and Chemical Management procedure (AE-91-IQ-098) will be followed during mixing operations to prevent spills. Full chemical disclosure is provided in **Appendix A** of this document.

In the unlikely event that a chemical spill (or hydrocarbons) occurs during activities, Apache's emergency response procedures are in place to cover such an occurrence. These include:

- NWS Operations Consolidated Oil Spill Contingency Plan (OSCP; AE-00-EF-008);
- Incident Command and Management Manual (AE-00-ZF-025);
- NWS Operations Consolidated Cyclone Response Plan (AE-91-IF-010);
- Varanus Hub Incident Response Plan (AE-00-ZF-044); and
- Hazard Reporting Incident Notification and Investigation Procedure (AE-91-IF-002).

In the event of a chemical or hydrocarbon spill on the platforms, 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 an oil spill to the ocean, Apache's OSCP 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 these activities and concluded that the proposed works are a normal well intervention activity with minor environmental risks. Besides the discharge of cement residues from cleaning activities, no additional risks were identified for the capillary (coiled) tubing activities. The use of capillary coil increases the success of the reservoir isolation by using the pipe as a conduit to spot a volume of cement directly at the perforations without contaminating the pill.

Besides the disposal of sewage, grey water (e.g. hand basins, kitchen sink), raw seawater (from holding tank overflow) and residual cement (from equipment cleaning activities) no discharges to the marine environment are expected to occur during the activities. The treatment chemicals will be stored in bunded areas and spill clean-up material is available to manage any small spills.

The identified potential hazards and environmental management controls are summarised in **Table 1**.

7. MANAGEMENT APPROACH

The activities will be managed in compliance with the *Varanus Island Hub Environment Plan* (Document Number EA-60-RI-186), and the Harriet Alpha, Bravo and Charlie Slickline and Temporary Well Suspension Bridging Document (Document number EA-00-RI-10030).

The primary goal of the environmental guidelines and commitments outlined in the GPSA EP, VI Hub EP and the BD are to direct, review and manage activities so that environmental impacts and risks are continually being reduced to ALARP. .

Table 1: Apache Environmental Guidelines and Commitments

| Activity | Requirement |
|---------------------------------|---|
| Chemical storage and management | <ul style="list-style-type: none"> • Maintain good housekeeping practices. • Hazardous chemicals are to be stored in bunded areas away from open drains and chemical containers are to be intact. • In the event of a spill, all actions are to be taken to control the spill. • Ensure absorbent material is available to use in soaking up chemical or oil spills. • SDS's are available on site for all chemicals used during the activity. • Chemicals selected are ranked Gold/Silver/D/E through OCNS, or listed PLONOR under OSPAR, or risk assessed in accordance with Apache's Drilling Fluid and Chemical Risk Assessment Procedure to ensure product is environmentally acceptable • Discharge of seawater with wet cement residues to the marine environment occurs only for the purpose of cleaning cementing and pumping equipment. • All treated seawater spills >80L and all hazardous chemical spills to the |

| | |
|---|---|
| | <p>ocean must be reported to DMP within 2 hours either directly by contacting the DMP Environment Division Duty Inspector on 0419 960 621 and via email to petroleum.environment@dmp.wa.gov.au or via the Apache Perth office</p> |
| Incident Reporting | <ul style="list-style-type: none"> • Use of the Apache incident reporting system to report • Reportable incidents to DMP (Environment Division Duty Officer on 0419 960 621) within 2 hours and emailed to petroleum.environment@dmp.wa.gov.au. (<i>Petroleum (Submerged Lands) (Environment) Regulations 2012</i>). • 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 (<i>Petroleum (Submerged Lands) (Environment) Regulations 2012</i>). |
| Spillage of diesel fuel or oil | <ul style="list-style-type: none"> • Follow Apache refuelling procedures (AE-91-IQ-098). • Refuelling to be carried out during daylight hours only, weather permitting. • In event of a spill take all actions to control the spill. • No dispersant use without DMP approval. • All spills >80L must be reported to DMP within 2 hours either directly by contacting the DMP Environment Division Duty Inspector on 0419 960 621 and via email to petroleum.environment@dmp.wa.gov.au. • All spills <80L must be reported to DMP by email petroleum.environment@dmp.wa.gov.au no later than 15 days after the end of each calendar month. • Report all spills through Apache incident reporting system. • Implement Apache's Oil Spill Contingency Plan if required |
| Discharge of combustion products from engines | <ul style="list-style-type: none"> • Inspections and tuning of engines and equipment are included on a regular maintenance schedule. |
| Solid waste management <ul style="list-style-type: none"> • Food scraps • Garbage • Litter • Scrap metal and wood etc | <ul style="list-style-type: none"> • Food scraps are bagged and taken back with crew to Varanus Island, where it will then be transported to shore for disposal. • No disposal of debris, garbage or litter into the sea. • Segregate industrial waste (scrap metals / drums etc.) wherever possible for appropriate disposal onshore. • Reduce, reuse and recycle waste wherever practicable. |
| Sewage discharge | <ul style="list-style-type: none"> • There is a functional sewage treatment plant on the Harriet Alpha platform. • Harriet Bravo and Charlie platforms have drop toilets. • Grey water will be discharged directly from the platforms. |
| Light Overspill | <ul style="list-style-type: none"> • No night time operations will be required. |
| Noise | <ul style="list-style-type: none"> • Activities will be carried out on the platform, therefore no impact from noise is expected |
| Fishing | <ul style="list-style-type: none"> • No fishing is permitted from the platforms. |
| Anchoring & Disturbance to the seabed | <ul style="list-style-type: none"> • No anchoring will take place. |
| Operational Environmental Awareness | <ul style="list-style-type: none"> • Through on-line inductions, site inductions and JSA's, all personnel are familiar with the environmental requirements of the EP and Bridging Document to ensure these guidelines and procedures are being followed. |

8. CONSULTATION

Apache has committed to consult with stakeholders where and when necessary on an ongoing basis. No non-government stakeholders of relevance to the slickline activities have been identified as the operations take place from existing platforms around which exclusion zones are already in place and no potentially significant impacts to stakeholders have been identified from the proposed 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:

Ashlee Crabbe
 Consultation Coordinator
 Apache Energy Limited
 100 St Georges Terrace, Perth, Western Australia, 6000
 Phone: 08 6218 7181
 Email: helen.astill@apachecorp.com

Appendix A – Chemical Disclosure

A. SYSTEM DETAILS:

| | |
|-------------------------|-------------------------------|
| OPERATOR: | APACHE |
| PROJECT / WELL: | Harriet Alpha, Bravo, Charlie |
| SYSTEM: | Well suspension |
| TOTAL VOLUME OF SYSTEM: | 1923 m ³ |

B. PRODUCT LIST

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|-------------------------|-----------------|------------------------|-----------------------------|---|---------------|
| Treated seawater | | | | | |
| Seawater | N/A | Carrier fluid | 99.97 | N/A | No |
| XC24380 | Baker Petrolite | Biocide - preservation | 0.030 | <p><u>Acute Mammalian Toxicity</u> <i>Tetrakis (hydroxymethyl) phosphonium sulphate(2:1)</i> LC₅₀ (4 hours) Inhalation dusts and mists Rat 0.591 mg/l LD₅₀ Oral Rat 248 mg/kg</p> <p><u>Aquatic Toxicity XC24380</u> LC₅₀ (96 hours) 72.5 mg/L <i>Scophthalmus maximus</i> NOEC (96 hours) 41.0 mg/L <i>Scophthalmus maximus</i> EC₅₀ (72 hours) 0.16 mg/L <i>Skeletonema costatum</i> LC₅₀ (48 hours) 0.60 mg/L <i>Acartia tonsa</i> LC₅₀ (48 hours) 0.85 mg/L <i>Acartia tonsa</i> NOEC (48 hours) 0.20 mg/L <i>Acartia tonsa</i> LC₅₀ (10 days) 2174 mg/kg <i>Corophium volutator</i></p> <p><u>Chronic Toxicity</u> No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R62, R63, R64) effects, for this product. R61 (Reproductive category) – may cause harm to the unborn child</p> <p><u>Biodegradation / bioaccumulation</u> Ready Biodegradability (Method OPPTS 835.4300) Biodegradability, 7 days 60%</p> <p><u>Octanol/Water Partition Coefficient (Log P_{ow})</u> Method: OECD 117 (HPLC) Log P_{ow} < 0 (100%)</p> | Yes |

A. SYSTEM DETAILS:

| | |
|-----------|--------|
| OPERATOR: | APACHE |
|-----------|--------|

| | |
|-------------------------|---------------------------------|
| PROJECT / WELL: | Harriet Alpha, Bravo, Charlie |
| SYSTEM: | Well suspension –capillary coil |
| TOTAL VOLUME OF SYSTEM: | 10 m ³ (63 bbls) |

B. PRODUCT LIST

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|----------------------------|----------|---------|-----------------------------|---|---------------|
| Cementing chemicals | | | | | |
| Cement Class G | BHI | Cement | 41.21 | <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> COMPONENT 1 (60 – 100% concentration) OSPAR PLONOR Listed <ul style="list-style-type: none"> Species: <i>Mysidopsis bahia</i> (Crustacean). EC50 24 hrs: >1,000 mg/L Species: <i>Scenedesmus subspicatus</i> (Algae). NOEC 72 hrs: 10,000 mg/L Species: <i>Brachydanio rerio</i> (Fish). LC50 96 hrs: >10,000 mg/L COMPONENT 2 – (5 – 10% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: <i>Gambusia affinis</i> (Fish) LC50 96 hrs: >56,000 mg/L Species: <i>Nitscheria linearis</i> (Algae) EC50 120 hrs: 3,200 mg/L Static Acute Saltwater Toxicity <ul style="list-style-type: none"> Species: <i>Sphaeroma serratum</i> (Crustacea) LC50 48 hours: 25,000 mg/L COMPONENT 3 (1 – 5% concentration) OSPAR PLONOR Listed No scientific data or research is available for this component. Data are presented for a similar ingredient. <ul style="list-style-type: none"> Species: <i>Pseudokirchneriella subcapitata</i> (Algae). EC50 72 hrs: 184.57 mg/L Species: <i>Oncorhynchus mykiss</i> (Fish). LC50 96 hrs: 50.6 mg/L Species: <i>Daphnia magna</i> (Crustacean). EC50 48 hrs: 49.1 mg/L COMPONENT 4 (1 – 5% concentration) OSPAR PLONOR Listed. Natural product – exempted under the Chemical Disclosure Guidelines. COMPONENT 5 (1 – 5% concentration) OSPAR PLONOR Listed No scientific data or research is available for this component. Data are presented for a similar ingredient. <ul style="list-style-type: none"> Species: <i>Pseudokirchneriella subcapitata</i> (Algae). EC50 72 hrs: >100 mg/L Species: <i>Daphnia magna</i> (Crustacean). LC50 48 hrs: 170.86 mg/L Species: <i>Oncorhynchus mykiss</i> (Fish). LC50 96 hrs: 775.8 mg/L COMPONENT 6 (0 – 0.1% concentration) OSPAR PLONOR Listed. Natural product – exempted under the Chemical Disclosure Guidelines. <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> COMPONENT 1 (60 – 100% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. | Yes |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|---------|-----------------------------|---|---------------|
| | | | | <ul style="list-style-type: none"> • COMPONENT 2 (5 - 10% concentration) Not applicable to inorganic compounds. • COMPONENT 3 (1 – 5% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. • COMPONENT 4 (1 – 5% concentration) OSPAR PLONOR Listed. Natural product – exempted under the Chemical Disclosure Guidelines. • COMPONENT 5 (1 – 5% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. • COMPONENT 6 (0 – 0.1% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> • COMPONENT 1 (60 – 100% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. • COMPONENT 2 (5 - 10% concentration) Not applicable to inorganic compounds. • COMPONENT 3 – (1 – 5% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. • COMPONENT 4 (1 – 5% concentration) OSPAR PLONOR Listed. Natural product – exempted under the Chemical Disclosure Guidelines. • COMPONENT 5 (1 – 5% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. • COMPONENT 6 (0 – 0.1% concentration) OSPAR PLONOR Listed. Not Applicable to inorganic compounds. <p>ACUTE MAMMALIAN TOXICITY</p> <ul style="list-style-type: none"> • COMPONENT 1 (60 – 100% concentration) Species: Rat (oral) LD50: >1,848 mg/kg • COMPONENT 2 (5 - 10% concentration) Species: Rat (oral) LD50: >5,000 mg/kg • COMPONENT 3 (1 – 5% concentration) Species: Rat (oral) LD50: >2,000 mg/kg • COMPONENT 4 (1 – 5% concentration) Species: Rat (oral) LD50: >2,000 mg/kg • COMPONENT 5 (1 – 5% concentration) Species: Rat (oral) LD50: >2,000 mg/kg • COMPONENT 6 (0 – 0.1% concentration) Species: Rat (oral) LD50: >5,000 mg/kg <p>CHRONIC TOXICITY This product does not carry any of the following R phrases for carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60,</p> | |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|-----------------|-----------------------------|---|---------------|
| | | | | R61, R62, R63, R64) effects. This product does contains crystalline silica quartz (14808-60-7 which is considered by IARC to be carcinogenic to humans. | |
| A-300L | BHI | Cement Additive | 4.01 | <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> • COMPONENT 1 (60 - 100% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. • COMPONENT 2 (30-60% concentration) OSPAR PLONOR listed. Natural product - exempted under the Chemical Disclosure Guidelines. • Whole product <ul style="list-style-type: none"> ○ Daphnia (Ceriodaphnia) EC50 48 hrs: 7600 mg/L ○ Algae (<i>Selastrum capricornutum</i>) IC50 48hrs: 440 mg/L NOEC 48hrs: 60mg/L ○ Fish (Zebra fish) LC50 96hrs: >5000 mg/L <p>CHEMICAL FATE Octanol/Water Partition Coefficient Not Applicable to inorganic compounds</p> <p>ENVIRONMENTAL FATE Ready Biodegradability Not Applicable to inorganic compounds</p> <p>ACUTE MAMMALIAN TOXICITY *</p> <ul style="list-style-type: none"> • COMPONENT 1 (60 - 100% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. • COMPONENT 2 (30-60% concentration) <ul style="list-style-type: none"> ○ Species: mouse (Oral) LD50: >5,000 mg/kg bw Study Duration: 14 days ○ Species: rabbit (Dermal) LD50: >5,000 mg/kg bw Study Duration: 5 days <p>CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects for this product.</p> | Yes |
| BA-58LS | BHI | Cement Additive | 4.09 | <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> • COMPONENT 1 (45 -55% concentration) OSPAR PLONOR Listed • COMPONENT 2 (> 45% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. <p>CHEMICAL FATE</p> <ul style="list-style-type: none"> • COMPONENT 1 (45 - 55% concentration) OSPAR PLONOR Listed • COMPONENT 2 (> 45% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. <p>ENVIRONMENTAL FATE</p> <ul style="list-style-type: none"> • COMPONENT 1 (45 - 55% concentration) OSPAR PLONOR Listed • COMPONENT 2 (> 45% concentration) | Yes |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|-----------------|-----------------------------|---|---------------|
| | | | | <p>Natural product - exempted under the Chemical Disclosure Guidelines.</p> <p>ACUTE MAMMALIAN TOXICITY *</p> <ul style="list-style-type: none"> COMPONENT 1 (45 - 55% concentration) Species: rat (oral) LD50: 3,160 mg/kg bw COMPONENT 2 (> 45% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. <p>* All mammalian toxicity values are based upon 100% active material</p> <p>CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects for this product.</p> | |
| CD-31LS | BHI | Cement Additive | 0.43 | <p>This product contains organic components.</p> <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> COMPONENT 1 (60 – 100% concentration) Natural product – exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a similar ingredient. Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: <i>Daphnia magna</i> LC50 48 hrs: 34 mg/L Species: <i>Desmodesmus subspicatus</i> EC50 96 hrs: 74 mg/L Species: <i>Leuciscus idus</i> LC50 96 hrs: > 464 – 1,000 mg/L COMPONENT 3 (1 – 5% concentration) OSPAR PLONOR Listed COMPONENT 4 (0 – 0.1% concentration) Static Acute Saltwater Toxicity <ul style="list-style-type: none"> Species: <i>Acartia tonsa</i> LC50 48 hrs: 0.60 mg/L Species: <i>Skeletonema costatum</i> EC50 72 hrs: 0.16 mg/L Species: <i>Scopthalmus maximus</i> LC50 96 hrs: 72.5 mg/L Species: <i>Corophium volutator</i> LC50 10 days: 2,174 mg/kg <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> COMPONENT 1 (60 – 100% concentration) Natural product – exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a similar ingredient. Method: OECD 117(HPLC) Log Pow -0.944 COMPONENT 3 (1 – 5% concentration) OSPAR PLONOR Listed COMPONENT 4 (0 – 0.1% concentration) Method: OECD 117(HPLC) Log Pow < 0 | Yes |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|------------|-----------------------------|---|---------------|
| | | | | <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> COMPONENT 1 (60 – 100% concentration) Natural product – exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a similar ingredient. Method: OECD301A Biodegradability 28 days > 90% COMPONENT 3 (1 – 5% concentration) OSPAR PLONOR Listed COMPONENT 4 (0 – 0.1% concentration) Method: OECD306 Biodegradability 28 days 40% <p>ACUTE MAMMALIAN TOXICITY</p> <ul style="list-style-type: none"> COMPONENT 1 (60 – 100% concentration) Natural product – exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (30 – 60% concentration) Species: Rat (oral) LD50: 3,800 mg/kg COMPONENT 3 (1 – 5% concentration) Species: Rat (oral) LD50: > 2,000 mg/kg COMPONENT 4 (0 – 0.1% concentration) Species: Rat (oral) LD50: 248 mg/kg <p>CHRONIC TOXICITY</p> <p>No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68) and mutagenic (R46) effects are known for any components in CD-31LS.</p> | |
| FL-66LS | BHI | Fluid Loss | 3.1 | <p>This product contains organic components.</p> <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> COMPONENT 1 (>60 % concentration) Natural product - exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (5 – 10 % Concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: <i>Daphnia magna</i> EC50 48 hrs: >116 mg/L Species: <i>Desmodesmus subspicatus</i> EC50 72 hrs: >100 mg/L Species: <i>Poecilia reticulata</i> LC50 96 hrs: >128 mg/L COMPONENT 3 (5 – 10 % Concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: <i>Daphnia magna</i> EC50 48 hrs: >1,000 mg/L Species: <i>Pseudokirchnerella subcapitata</i> EC50 72 hrs: >2,000 mg/L Species: <i>Lepomis macrochirus</i> LC50 96 hrs: >1,000 mg/L COMPONENT 4 (< 0.1 % Concentration) Static Acute Saltwater Toxicity <ul style="list-style-type: none"> Species: <i>Acartia tonsa</i> LC50 48 hrs: 0.60 mg/L Species: <i>Skeletonema costatum</i> EC50 72 hrs: 0.16 mg/L Species: <i>Scopthalmus maximus</i> | Yes |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|----------|-----------------------------|---|---------------|
| | | | | <p>LC50 96 hrs: 72.5 mg/L</p> <ul style="list-style-type: none"> Species: <i>Corophium volutator</i> <p>LC50 10 days: 2,174 mg/kg</p> <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> COMPONENT 1 (>60 % concentration) Natural product - exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (5 – 10 % Concentration) Method: EU Method A.8 Log Pow: -2.16 COMPONENT 3 (5 – 10 % Concentration) Method: Calculation Log Pow: < 0 COMPONENT 4 (< 0.1 % Concentration) Method: OECD 117(HPLC) Log Pow: < 0 <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> COMPONENT 1 (>60 % concentration) Natural product - exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (5 – 10 % Concentration) Method: EU Method C.4-E Biodegradability 28 days: 1.6% COMPONENT 3 (5 – 10 % Concentration) Method: 40 CFR 795.3340 Biodegradability 44 days: < 10% COMPONENT 4 (< 0.1 % Concentration) Method: OECD306 Biodegradability 28 days: 40% <p>ACUTE MAMMALIAN TOXICITY</p> <ul style="list-style-type: none"> COMPONENT 1 (>60 % concentration) Natural product - exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (5 – 10 % Concentration) Species: Rat (oral) LD50: > 2,000 mg/kg bw COMPONENT 3 (5 – 10 % Concentration) Species: Rat (oral) LD50: > 16,000 mg/kg bw COMPONENT 4 (< 0.1 % Concentration) Species: Rat (oral) LD50; 248 mg/kg bw <p>CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68) and mutagenic (R46) effects are known for any components in FL-66LS.</p> | |
| FP-9LS | BHI | Antifoam | 0.1 | <p>This product is organic.</p> <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> COMPONENT 1 (10 - 30% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: <i>Daphnia magna</i> EC50 48 hrs: 1.4 mg/L Species: <i>Pseudokirchneriella subcapita</i> EC50 72 hrs: 1 – 3 mg/L Species: Rainbow trout LC50 96 hrs: 2 - 5 mg/L | Yes |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|----------|-----------------------------|--|---------------|
| | | | | <p>COMPONENT 2 (60 – 100% concentration) Static Acute Freshwater Toxicity</p> <ul style="list-style-type: none"> Species: Golden orfe LC50 96 hrs: > 100 mg/L <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> COMPONENT 1 (10 - 30% concentration) Method: OECD 117 (HPLC) Log Pow: 6.5 COMPONENT 2 (60 – 100% concentration) Method: OECD 117 (HPLC) Log Pow: MW > 700 <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> COMPONENT 1 (10 - 30% concentration) Method: OECD306 Biodegradability 28 days: 32% COMPONENT 2 (60 – 100% concentration) Method: OECD301 Biodegradability 28 days: Not readily biodegradable <p>ACUTE MAMMALIAN TOXICITY *</p> <ul style="list-style-type: none"> COMPONENT 1 (10 - 30% concentration) Species: rat (oral) LD50: >2,000 mg/kg bw COMPONENT 2 (60 – 100% concentration) Species: rat (oral) LD50: >5,000 mg/kg bw <p>* All mammalian toxicity values are based upon 100% active material</p> <p>CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects for this product.</p> | |
| R-21LS | BHI | Retarder | 1.18 | <p>This product contains organic components.</p> <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> COMPONENT 1 (> 60 concentration) Natural product - exempted under the Chemical Disclosure Guidelines. COMPONENT 2 – (5 – 10% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: Medaka (Fish) LC50 96 hrs: >100 mg/L Species: <i>Desmodesmus sp.</i> (Algae) EC50 72 hrs: > 1,000 mg/L Species: <i>Daphnia magna</i> (Crustacea) LC50 48 hrs: >1,000 mg/L COMPONENT 3 (1 – 5% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Species: Rainbow trout LC50 48 hrs: 1,200 mg/L Static Acute Saltwater Toxicity <ul style="list-style-type: none"> Species: <i>Acartia tonsa</i> (Crustacea) LC50 48 hrs: >250 mg/L Species: <i>Skeletonema costatum</i> (Algae) LC50 72 hrs: 36 mg/L COMPONENT 4 (1 – 5% concentration) OSPAR PLONOR Listed COMPONENT 5 (1 – 5% concentration) | Yes |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|---------|-----------------------------|---|---------------|
| | | | | <p>OSPAR PLONOR Listed</p> <ul style="list-style-type: none"> • COMPONENT 6 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 7 (0 – 0.1% concentration) Static Acute Saltwater Toxicity <ul style="list-style-type: none"> ○ Species: <i>Acartia tonsa</i> LC50 48 hrs: 0.60 mg/L ○ Species: <i>Skeletonema costatum</i> EC50 72 hrs: 0.16 mg/L ○ Species: <i>Scopthalmus maximus</i> LC50 96 hrs: 72.5 mg/L ○ Species: <i>Corophium volutator</i> LC50 10 days: 2,174 mg/kg <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> • COMPONENT 1 (> 60% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. • COMPONENT 2 (5 - 10% concentration) Method: QSAR by EpiWin Log Pow: -1.87 • COMPONENT 3 (1 – 5% concentration) - Method: QSAR Log Pow: -2.84 • COMPONENT 4 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 5 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 6 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 7 (0 – 0.1% concentration) Method: OECD 117(HPLC) Log Pow: < 0 <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> • COMPONENT 1 (> 60% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. • COMPONENT 2 (5 - 10% concentration) Method: OECD301D Biodegradability 28 days: 89% • COMPONENT 3 – (1 – 5% concentration) Method: OECD301D Biodegradability 28 days: 7% • COMPONENT 4 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 5 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 6 (1 – 5% concentration) OSPAR PLONOR Listed • COMPONENT 7 (0 – 0.1% concentration) Method: OECD306 Biodegradability 28 days: 40% <p>ACUTE MAMMALIAN TOXICITY</p> <ul style="list-style-type: none"> • COMPONENT 1 (> 60% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. • COMPONENT 2 (5 - 10% concentration) Species: Rat (oral) LD50: 6,060 mg/kg • COMPONENT 3 (1 – 5% concentration) | |

| Trade name | Supplier | Purpose | Product in system fluid (%) | Toxicity & Ecotoxicity Info | MSDS attached |
|------------|----------|---------|-----------------------------|---|---------------|
| | | | | Species: Rat (oral) LD50: > 100,000 µL /kg <ul style="list-style-type: none"> • COMPONENT 4 (1 – 5% concentration) Species: Rat (oral) LD50: 3,350 mg/kg • COMPONENT 5 (1 – 5% concentration) Species: Rat (oral) LD50: >10,000 mg/kg • COMPONENT 6 (1 – 5% concentration) Species: Rat (oral) LD50: >10,000 mg/kg • COMPONENT 7 (0 – 0.1% concentration) Species: Rat (oral) LD50: 248 mg/kg CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects for this product. | |
| Water | BHI | Water | 45.87 | Exempt from chemical disclosure | No |

C. CHEMICAL LIST

| Chemicals within products in Part B – treated seawater | CAS number | Mass fraction (%) |
|--|------------|-------------------|
| H ₂ O | 7732-18-5 | 99.97 |
| NaCl | 7647-14-5 | |
| Trace minerals (Mg, S, Ca, K, Br, C) | - | |
| Tetrakis (hydroxymethyl) phosphonium sulphate (2:1) | 55566-30-8 | 0.03 |
| Total | | ~100% |

| Chemicals within products in Part B – capillary coil | CAS number | Mass fraction (%) |
|--|------------|-------------------|
| Water | 7732-18-5 | 54.437% |
| Cement, Portland, Chemicals | 65997-15-1 | 34.842% |
| Silica | 7631-86-9 | 4.4128% |
| Gypsum | 13397-24-5 | 2.4056% |
| Calcium Oxide | 1305-78-8 | 1.0024% |
| Calcium Carbonate | 1317-65-3 | 1.0024% |
| Magnesium Oxide | 1309-48-4 | 0.80188% |
| 1-Propanesulfonic Acid, 2-Methyl-2-[(1-Oxo-2- | 5165-97-9 | 0.28752% |
| Humic Acids, Potassium Salts | 68514-28-3 | 0.28752% |
| Sodium Polynaphthalene Sulphonate | 9084-06-4 | 0.14978% |
| D-Gluconic Acid | 526-95-4 | 0.12336% |
| Polyoxyalkylene Triol | 9082-00-2 | 0.07614% |
| Phosphonic Acid, Sodium Salt | 22042-96-2 | 0.04635% |
| Crystalline Silica: Quartz (SiO ₂) | 14808-60-7 | 0.04009% |
| Sodium Sulfate | 7757-82-6 | 0.02311% |
| Distillates (Petroleum), Hydrotreated Light | 64742-47-8 | 0.02018% |
| Sodium Chloride | 7647-14-5 | 0.01483% |
| Sodium Lignosulfonate | 8061-51-6 | 0.01241% |
| Lignosulfonic Acid, Calcium Salt | 8061-52-7 | 0.01241% |
| Tetrakis(Hydroxymethyl)Phosphonium Sulphate | 55566-30-8 | 0.00234% |
| Formaldehyde | 50-00-0 | < 0.00001% |
| Total | | 100% |

Appendix B - Chemical SDS

XC24380

1. Identification of the material and supplier

Names

Product name : XC24380
Product code : XC24380
ADG : Toxic liquid, organic, n.o.s. (tetrakis(hydroxymethyl)phosphonium sulphate)
Supplier : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

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

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
- Australia: (02) 9037 2994
- New Zealand: 9801 0034
- PNG: +(61) 2 9037 2994

- UK: +(44) 870-820-0418
- USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

Uses

Material uses : Biocide

2. Hazards identification

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

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

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

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

3. Composition/information on ingredients

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

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

3 . Composition/information on ingredients

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

4 . First-aid measures

- Inhalation** : Get medical attention immediately. Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
- Ingestion** : Get medical attention immediately. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
- Skin contact** : Obtain immediate medical attention after the following First Aid measures have been administered. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Eye contact** : Obtain immediate medical attention after the following First Aid measures have been administered. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Advice to doctor** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides
phosphorus oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Hazchem code** : 2X

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

6 . Accidental release measures

- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.
- Small spill** : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled 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

tetrakis(hydroxymethyl)phosphonium sulphate(2:1)

Exposure limits

ACGIH TLV (United States, 1/2011). Skin sensitiser.

TWA: 2 mg/m³ 8 hour(s).

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

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

10 . Stability and reactivity

| | |
|---|---|
| Chemical stability | : The product is stable. |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur. |
| Conditions to avoid | : Avoid exposure - obtain special instructions before use. Avoid release to the environment. Refer to special instructions/safety data sheet. |
| Materials to avoid | : No specific data. |
| Hazardous decomposition products | : Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

11 . Toxicological information

Potential acute health effects

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

Acute toxicity

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

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

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

11 . Toxicological information

| | |
|------------------------------|---|
| Chronic effects | : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. |
| Carcinogenicity | : No known significant effects or critical hazards. |
| Mutagenicity | : No known significant effects or critical hazards. |
| Teratogenicity | : May cause birth defects. |
| Developmental effects | : No known significant effects or critical hazards. |
| Fertility effects | : No known significant effects or critical hazards. |
| Inhalation | : No specific data. |
| Ingestion | : No specific data. |
| Skin | : Adverse symptoms may include the following: irritation redness |
| Eyes | : Adverse symptoms may include the following: pain or irritation watering redness |
| Target organs | : Contains material which may cause damage to the following organs: skin. |

12 . Ecological information

Ecotoxicity : Very toxic to aquatic organisms.

Aquatic ecotoxicity

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

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

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

Conclusion/Summary : Not available.



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

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







13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

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

14 . Transport information

| | | | | | | |
|-------------|--------|--|-----|-----|--|-----------------------|
| ADR | UN2810 | Toxic liquid, organic, n.o.s. (tetrakis(hydroxymethyl)phosphonium sulphate) | 6.1 | III |   | UK Hazchem: 2X |
| IMDG | UN2810 | Toxic liquid, organic, n.o.s. (tetrakis(hydroxymethyl)phosphonium sulphate) | 6.1 | III |   | - |
| IATA | UN2810 | Toxic liquid, organic, n.o.s. (tetrakis(hydroxymethyl)phosphonium sulphate) | 6.1 | III |   | - |

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

Not regulated.

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Repr. Cat. 2; R61

T; R23

Xn; R22

Xi; R41

R43

N; R50

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

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

National regulations : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

16 . Other information

Date of printing : 25 February 2013.

Date of issue/ Date of revision : 25 February 2013

Date of previous issue : 12 April 2012

Version : 2

☑ Indicates information that has changed from previously issued version.

Disclaimer

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Cement Class G

1. Identification of the material and supplier

Names

Product name : Cement Class G
Product code : 100021
ADG : -
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +613 9350 3800
Fax: +613 9350 5453

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 : Cementing

2. Hazards identification

Classification : Xi; R41, R37/38

Risk phrases : R41- Risk of serious damage to eyes.
R37/38- Irritating to respiratory system and skin.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S39- Wear eye/face protection.

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

3. Composition/information on ingredients

CAS number : 65997-15-1

| Ingredient name | CAS number | Concentration |
|-----------------------------|------------|---------------|
| Cement, portland, chemicals | 65997-15-1 | 60 - 100 |
| Gypsum | 13397-24-5 | 5 - 10 |
| calcium oxide | 1305-78-8 | 1 - 5 |
| Limestone | 1317-65-3 | 1 - 5 |
| magnesium oxide | 1309-48-4 | 1 - 5 |

Not applicable.

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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Eye contact** : Obtain immediate medical attention after the following First Aid measures have been administered. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- 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
sulfur oxides
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing dust. 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** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. 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

Cement, portland, chemicals

Gypsum

calcium oxide

Limestone

magnesium oxide

Exposure limits

Safe Work Australia (Australia, 4/2013).

TWA: 10 mg/m³ 8 hours.

ACGIH TLV (United States, 6/2013).

TWA: 10 mg/m³ 8 hours. Form: Inhalable fraction

Safe Work Australia (Australia, 4/2013).

TWA: 2 mg/m³ 8 hours.

EH40/2005 WELs (United Kingdom (UK), 12/2011).

TWA: 10 mg/m³ 8 hours. Form: inhalable dust

TWA: 4 mg/m³ 8 hours. Form: respirable dust

Safe Work Australia (Australia, 4/2013).

TWA: 10 mg/m³ 8 hours. Form: Fume

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

- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If operating conditions cause high dust concentrations to be produced, use dust goggles.

- 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 | : Solid. [Powder.] |
| Colour | : Grey. White to off-white. |
| Odour | : Odourless. |
| Boiling point | : >1000°C (>1832°F) |
| Relative density | : 3.15 |
| Solubility | : Very slightly soluble in the following materials: cold water and hot 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 | : Irritating to respiratory system. |
| Ingestion | : Irritating to mouth, throat and stomach. |
| Skin contact | : Irritating to skin. |
| Eye contact | : Severely irritating to eyes. Risk of serious damage to eyes. |

Acute toxicity

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

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 : Adverse symptoms may include the following:
respiratory tract irritation
coughing

11 . Toxicological information

| | |
|----------------------|---|
| Ingestion | : No specific data. |
| Skin | : Adverse symptoms may include the following: irritation redness |
| Eyes | : Adverse symptoms may include the following: pain or irritation watering redness |
| Target organs | : Contains material which may cause damage to the following organs: lungs, digestive system, upper respiratory tract, skin, eyes, nose/sinuses. |

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

| Product/ingredient name | Result | Species | Exposure |
|--------------------------------|-----------------------------------|--|-----------------|
| calcium oxide | Chronic NOEC 100 mg/l Fresh water | Fish - Oreochromis niloticus - Juvenile (Fledgling, Hatchling, Weanling) | 46 days |

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

| Product/ingredient name | LogP_{ow} | BCF | Potential |
|--------------------------------|--------------------------|------------|------------------|
| calcium oxide | - | 2.34 | low |

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 Uniform Schedule of Medicine and Poisons

Not regulated.

Sector of Use : Industrial
Professional

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

- Australia inventory (AICS)** : All components are listed or exempted.
- EU Classification** : Xi; R41, R37/38
- Risk phrases** : R41- Risk of serious damage to eyes.
R37/38- Irritating to respiratory system and skin.
- Safety phrases** : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S39- Wear eye/face protection.
- National regulations** : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

16 . Other information

- Date of printing** : 5 April 2014.
- Date of issue/ Date of revision** : 5 April 2014
- Date of previous issue** : No previous validation
- Version** : 1

Indicates information that has changed from previously issued version.

Disclaimer

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A-300L

1. Identification of the material and supplier

Names

Product name : A-300L
Product code : 415039
ADG : NOT REGULATED
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +618 9350 3800
Fax: +618 9350 5453

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 : Cement additive

2. Hazards identification

Classification : Not regulated.
Risk phrases : Not classified.
Statement of hazardous/dangerous nature : NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

| Ingredient name | CAS number | Concentration |
|-----------------|------------|---------------|
| silicon dioxide | 7631-86-9 | 10 - 30 |

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. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

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.

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:
metal oxide/oxides

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

Hazchem code : -

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. 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. 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. 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

| <u>Ingredient name</u> | <u>Exposure limits</u> |
|--|---|
| silicon dioxide | Safe Work Australia (Australia, 4/2013). TWA: 2 mg/m ³ 8 hours. Form: Respirable dust and fumes |
| Recommended monitoring procedures | : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. |
| Engineering measures | : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits. |

8 . Exposure controls/personal protection

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. 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. > 8 hours (breakthrough time): Rubber gloves. / polyvinyl chloride (PVC)
- 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** : Milky. [Light]
- Odour** : Mild.
- Boiling point** : 100°C (212°F)
- Melting point** : 0°C (32°F)
- Vapour pressure** : 2.3 kPa (17.5 mm Hg) [room temperature]
- Relative density** : 1.2
- Flash point** : Closed cup: Not applicable.
- pH** : 9 to 10
- Viscosity** : Dynamic (room temperature): <15 mPa·s (<15 cP)

10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.
- Skin contact** : 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

| | | | | |
|-----------------|-----------|-----|-------------|---|
| silicon dioxide | LD50 Oral | Rat | >3000 mg/kg | - |
| A-300L | LD50 Oral | Rat | >2000 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 |
|-------------------------|----------------------|---------|-------|------------------------|-------------|
| silicon dioxide | Eyes - Mild irritant | Rabbit | - | 24 hours 25 milligrams | - |

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, eyes.

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

| Product/ingredient name | Result | Species | Exposure |
|-------------------------|-----------------------|-----------------------------------|----------|
| A-300L | Acute EC50 7600 mg/l | Daphnia - Ceriodaphnia | 48 hours |
| | Acute IC50 440 mg/l | Algae - Selenastrum capricornutum | 48 hours |
| | Acute LC50 >5000 mg/l | Fish - Zebra Fish | 96 hours |
| | Acute NOEC 60 mg/l | Algae - Selenastrum capricornutum | 48 hours |

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

| Regulation | UN number | Proper shipping name | Classes | PG* | Label | Additional information |
|-------------|----------------|-----------------------|---------|-----|-------|--------------------------|
| ADG | Not regulated. | NOT REGULATED | - | - | | Hazchem code - |
| ADR | Not regulated. | NOT REGULATED | - | - | | UK Hazchem: - |
| IMDG | Not regulated. | NOT REGULATED BY IMO | - | - | | - |
| IATA | Not regulated. | NOT REGULATED BY IATA | - | - | | - |

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Sector of Use : Industrial

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Not classified.

Risk phrases : Not classified.

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 : 20 May 2014.

Date of issue/ Date of revision : 20 May 2014

Date of previous issue : No previous validation

Version : 1

Indicates information that has changed from previously issued version.

Disclaimer

16 . Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

BA-58L(S)

1. Identification of the material and supplier

Names

Product name : BA-58L(S)
Product code : 422622
ADG : NOT REGULATED
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +618 9350 3800
Fax: +618 9350 5453

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 : Cement additive

2. Hazards identification

Classification : Not regulated.
Risk phrases : Not classified.
Statement of hazardous/dangerous nature : NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

| Ingredient name | CAS number | Concentration |
|-----------------|------------|---------------|
| silicon dioxide | 7631-86-9 | 30 - 60 |

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. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

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.

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:
metal oxide/oxides

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

Hazchem code : -

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. 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. 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. 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
silicon dioxide

Exposure limits

Safe Work Australia (Australia, 4/2013).

TWA: 2 mg/m³ 8 hours. Form: Respirable dust and fumes

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

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

8 . Exposure controls/personal protection

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. 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. > 8 hours (breakthrough time): Rubber gloves.
- 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. Recommended: No personal respiratory protective equipment normally required.
- 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. [aqueous suspensions]
- Colour** : Grey.
- Odour** : Odourless.
- Melting point** : 0°C (32°F)
- Relative density** : 1.4
- Flash point** : Closed cup: Not applicable.
- pH** : 5 to 7
- Solubility** : Very slightly soluble in the following materials: cold water and hot water.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.
- Skin contact** : 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 |
|---------------------------|------------------|---------|-------------|----------|
| silicon dioxide | LD50 Oral | Rat | >3000 mg/kg | - |
| Conclusion/Summary | : Not available. | | | |

11 . Toxicological information

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

| Product/ingredient name | Result | Species | Score | Exposure | Observation |
|-------------------------|----------------------|---------|-------|------------------------|-------------|
| silicon dioxide | Eyes - Mild irritant | Rabbit | - | 24 hours 25 milligrams | - |

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, eyes.

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

| Regulation | UN number | Proper shipping name | Classes | PG* | Label | Additional information |
|-------------|----------------|-----------------------|---------|-----|-------|--------------------------|
| ADG | Not regulated. | NOT REGULATED | - | - | | <u>Hazchem code</u> - |
| ADR | Not regulated. | NOT REGULATED | - | - | | UK Hazchem: - |
| IMDG | Not regulated. | NOT REGULATED BY IMO | - | - | | - |
| IATA | Not regulated. | NOT REGULATED BY IATA | - | - | | - |

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Sector of Use : Industrial

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Not classified.

Risk phrases : Not classified.

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 : 20 May 2014.

Date of issue/ Date of revision : 20 May 2014

Date of previous issue : No previous validation

Version : 1

Indicates information that has changed from previously issued version.

Disclaimer

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

CD-31LS

1. Identification of the material and supplier

Names

Product name : CD-31LS
Product code : 424011
ADG : Not regulated.
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +618 9350 3800
Fax: +618 9350 5453

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 : Cement Additive.

2. Hazards identification

Classification : Xi; R36/38
Risk phrases : R36/38- Irritating to eyes and skin.
Statement of hazardous/dangerous nature : HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

| Ingredient name | CAS number | Concentration |
|---|------------|------------------|
| Modified naphthalene condensate salt tetrakis(hydroxymethyl)phosphonium sulphate(2:1) | 55566-30-8 | 30 - 60 < 0.5 |

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

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

4. First-aid measures

Inhalation : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

4 . First-aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention.
- 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.
- 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
sulfur oxides
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- 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 | : No exposure standard allocated. |
| Recommended monitoring procedures | : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. |
| Engineering measures | : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits. |
| Hygiene measures | : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location. |
| Eyes | : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. |
| Hands | : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. |
| Respiratory | : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. |
| Skin | : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. |
| Environmental exposure controls | : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels. |

9 . Physical and chemical properties

| | |
|-------------------------|---|
| Physical state | : Liquid. |
| Colour | : Brown. [Dark] |
| Odour | : Mild. |
| Relative density | : 1.16 to 1.22 (20°C) |
| Flash point | : Closed cup: Not applicable. |
| pH | : 8 to 10 [Conc. (% w/w): 100%] |
| Solubility | : Soluble in the following materials: cold water and hot 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 : Irritating to mouth, throat and stomach.
Skin contact : Irritating to skin.
Eye contact : Irritating to eyes.

Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|--------------------------------------|-----------|---------|------------|----------|
| Modified naphthalene condensate salt | LD50 Oral | Rat | 3800 mg/kg | - |

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : 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 : Adverse symptoms may include the following:
irritation
redness

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

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

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

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Xi; R36/38

Risk phrases : R36/38- Irritating to eyes and skin.

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

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Date of issue/ Date of revision : 29 July 2014

Date of previous issue : 19 February 2014

Version : 1.01

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.

FL-66LS

1. Identification of the material and supplier

Names

Product name : FL-66LS
Product code : 488270
ADG : Not regulated.
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +618 9350 3800
Fax: +618 9350 5453

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 : Cement additive

2. Hazards identification

Classification : Not regulated.
Risk phrases : Not classified.
Statement of hazardous/dangerous nature : NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

| Ingredient name | CAS number | Concentration |
|--|------------|---------------|
| tetrakis(hydroxymethyl)phosphonium sulphate(2:1) | 55566-30-8 | < 0.5 |

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

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

4. First-aid measures

Inhalation : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

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.

4 . First-aid measures

- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.
- Advice to doctor** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

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

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. 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. 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. 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** : **No exposure standard allocated.**
- 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** : Brown. [Dark]
- Odour** : Mild.
- Boiling point** : 100°C (212°F)
- Relative density** : 1.06
- Flash point** : Closed cup: Not applicable.
- pH** : 6 to 8
- Solubility** : Soluble in the following materials: cold water and hot 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** : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Ingestion** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Eye contact** : No known significant effects or critical hazards.

11 . Toxicological information

Acute toxicity

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : 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.

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

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

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Not classified.

Risk phrases : Not classified.

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 : 29 July 2014.

Date of issue/ Date of revision : 29 July 2014

Date of previous issue : 5 April 2014

Version : 1.01

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.

FP-9LS

1. Identification of the material and supplier

Names

Product name : FP-9LS
Product code : 555214
ADG : -
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +613 9350 3800
Fax: +613 9350 5453

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 : Anti-foamer

2. Hazards identification

Classification : Xn; R65
Xi; R38
R52/53
Risk phrases : R65- Harmful: may cause lung damage if swallowed.
R38- Irritating to skin.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Statement of hazardous/dangerous nature : HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

| Ingredient name | CAS number | Concentration |
|---|------------|---------------|
| Distillates (petroleum), hydrotreated light | 64742-47-8 | 10 - 30 |

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.

4 . First-aid measures

- Ingestion** : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. 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. Continue to rinse for at least 15 minutes. Get medical attention. 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.
- Advice to doctor** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. This material is harmful to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material.
- Small spill** : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name

Distillates (petroleum), hydrotreated light

Exposure limits

ACGIH TLV (United States, 6/2013). Absorbed through skin.

TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. > 8 hours (breakthrough time): Nitrile gloves.
- 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. Recommended: half-face mask, organic vapour filter (Type A)
- 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 to light amber.
- Odour** : Mild.
- Boiling point** : >200°C (>392°F)
- Relative density** : 0.98 to 1 (20°C)
- Flash point** : Closed cup: >100°C (>212°F) [ASTM D93-85, Pensky-Martens]
- Viscosity** : Kinematic (40°C (104°F)): 0.01 to 0.1 cm²/s (1 to 10 cSt)
- Solubility** : Very slightly soluble in the following materials: cold water and hot 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 | : Aspiration hazard if swallowed. Can enter lungs and cause damage. Irritating to mouth, throat and stomach. |
| Skin contact | : Irritating to skin. |
| Eye contact | : No known significant effects or critical hazards. |

Acute toxicity

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Inhalation : No specific data.

Ingestion : Adverse symptoms may include the following: nausea or vomiting

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : No specific data.

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

12 . Ecological information

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

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

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

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Xn; R65
Xi; R38
R52/53

Risk phrases : R65- Harmful: may cause lung damage if swallowed.
R38- Irritating to skin.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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 : 5 April 2014.
Date of issue/ Date of revision : 5 April 2014
Date of previous issue : No previous validation
Version : 1

Indicates information that has changed from previously issued version.

Disclaimer

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

R-21LS

1. Identification of the material and supplier

Names

Product name : R-21LS
Product code : 423521
ADG : Not regulated.
Supplier : Baker Hughes, Australia
108 Poole Street,
Welshpool,
Western Australia 6106,
Australia

Tel: +618 9350 3800
Fax: +618 9350 5453

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 : Cement retarder

2. Hazards identification

Classification : Not regulated.
Risk phrases : Not classified.
Statement of hazardous/dangerous nature : NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

3. Composition/information on ingredients

| Ingredient name | CAS number | Concentration |
|--|------------|---------------|
| tetrakis(hydroxymethyl)phosphonium sulphate(2:1) | 55566-30-8 | < 0.5 |
| Formaldehyde | 50-00-0 | < 0.1 |

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. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

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.

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
sulfur oxides
metal oxide/oxides

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

Hazchem code : -

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. 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. 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. 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

Formaldehyde

Exposure limits

Safe Work Australia (Australia, 1/2014). Skin sensitiser.

STEL: 2.5 mg/m³ 15 minutes.

STEL: 2 ppm 15 minutes.

TWA: 1.2 mg/m³ 8 hours.

TWA: 1 ppm 8 hours.

8 . Exposure controls/personal protection

| | |
|--|---|
| Recommended monitoring procedures | : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. |
| Engineering measures | : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits. |
| Hygiene measures | : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location. |
| Eyes | : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. |
| Hands | : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. |
| Respiratory | : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. |
| Skin | : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. |
| Environmental exposure controls | : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels. |

9 . Physical and chemical properties

| | |
|-------------------------|--|
| Physical state | : Liquid. |
| Colour | : Amber. / Brown. |
| Odour | : Mild. |
| Boiling point | : >100°C (>212°F) |
| Melting point | : 0°C (32°F) |
| Relative density | : 1.05 to 1.1 |
| Flash point | : Closed cup: Not applicable. |
| pH | : 4 to 6 |
| 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 : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Eye contact : No known significant effects or critical hazards.

Acute toxicity

- Conclusion/Summary** : Not available.

Potential chronic health effects

Chronic toxicity

- Conclusion/Summary** : Not available.

Irritation/Corrosion

- Conclusion/Summary** : Not available.

Sensitiser

- Conclusion/Summary** : Not available.

Carcinogenicity

- Conclusion/Summary** : Not available.

Mutagenicity

- Conclusion/Summary** : Not available.

Teratogenicity

- Conclusion/Summary** : Not available.

Reproductive toxicity

- Conclusion/Summary** : Not available.

Chronic effects : 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: central nervous system (CNS).

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

Methods of disposal : This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

| Regulation | UN number | Proper shipping name | Classes | PG* | Label | Additional information |
|-------------|----------------|-----------------------|---------|-----|-------|--------------------------|
| ADG | Not regulated. | Not regulated. | - | - | | Hazchem code - |
| ADR | Not regulated. | Not regulated. | - | - | | UK Hazchem: - |
| IMDG | Not regulated. | Not regulated by IMO. | - | - | | - |
| IATA | Not regulated. | Not Regulated by IATA | - | - | | - |

PG* : Packing group

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Not classified.

Risk phrases : Not classified.

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 : 29 July 2014.

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Date of previous issue : 5 April 2014

Version : 1.01

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.

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