



**Ungani Evaporation Trial and Additional
Chemical Disclosure
Environment Plan Bridging Document:
Summary Document**

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1. INTRODUCTION

Buru Energy Limited (Company) is an Australian ASX listed company engaged in oil and gas exploration in the Kimberley region of Western Australia, in an area known in geological terms as the Canning Superbasin.

The Company has developed the *Ungani Extended Production Testing Environment Plan* Revision 2 (HSE-PLN-004) (EPT Environment Plan) for the management of environmental aspects associated with the Company's extended production testing operations at the Ungani Facility.

The *Ungani Evaporation Trial Extension and Additional Chemical Disclosure Environment Plan Bridging Document* (L2872) (Bridging Document) details the extension of the trial of enhanced evaporation for produced water management, and details additional chemicals that be used downhole at the Ungani Facility, as part of the Extended Production Testing (the Activity). This Summary Document summarises the operations and mitigation and management measures in the approved Bridging Document and Environment Plan.

1.1. Contact Details

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2. OVERVIEW OF THE ACTIVITY

The Activity will be undertaken at the existing Ungani 1 ST1, Ungani 2 and Ungani 3 well sites, collectively called the Ungani Facility. The general characteristics of the wells are provided in Table 1.

Table 1: Details of the Ungani wells.

Well	Date Drilled	Location	
		Easting	Northing
Ungani 1ST1	August – September 2011	517,375 mE	8,010,864 mN
Ungani 2	November – January 2012	517,365 mE	8,010,848 mN
Ungani 3	January – March 2014	518,470 mE	8,011,035 mN

The Ungani Facility is located within petroleum exploration permit EP 391 R2 as shown on Figure 1. The Ungani Facility is located approximately 100 km east of Broome and 86 km southwest of Derby on Yakka Munga Station.

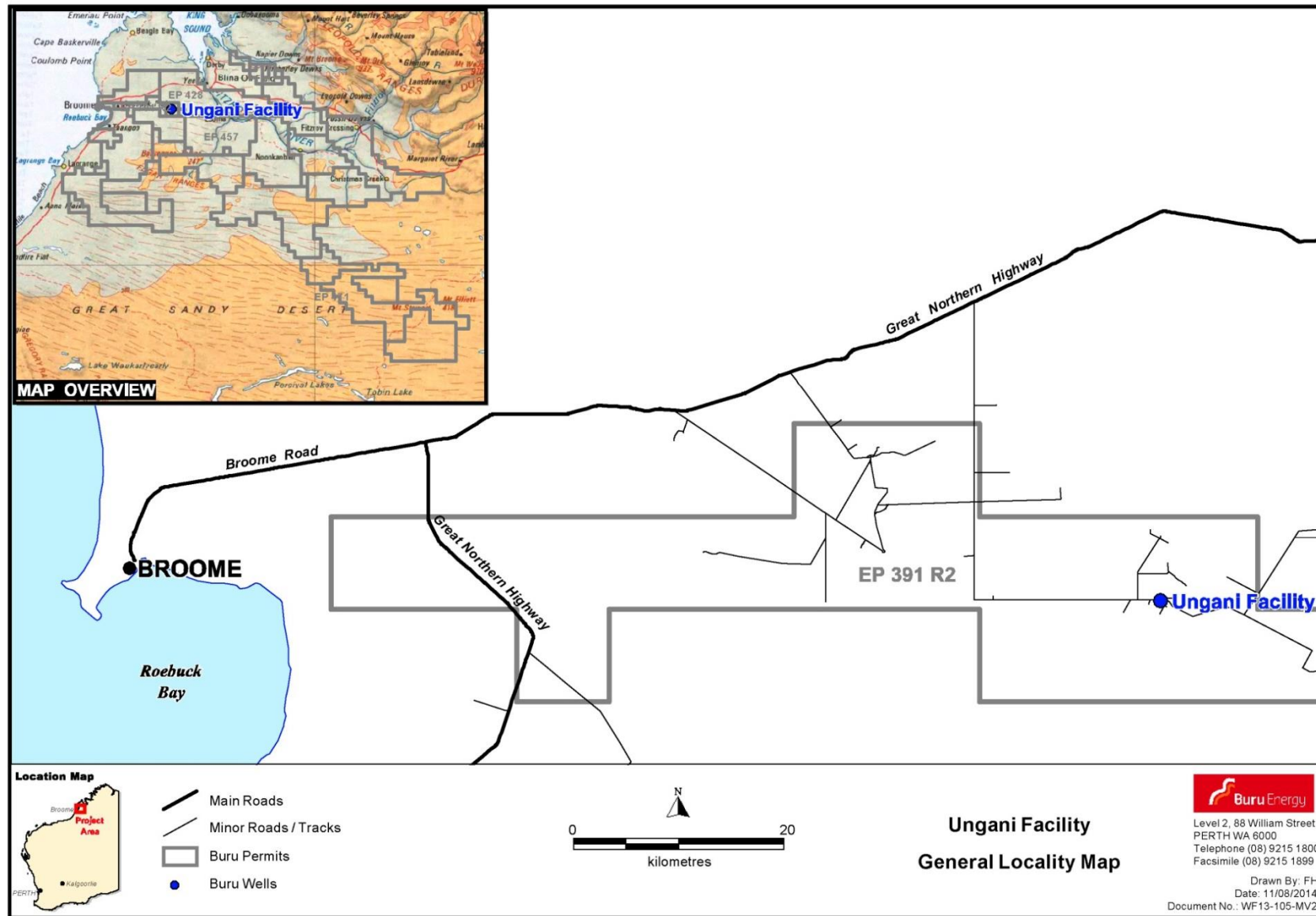


Figure 1: Location of the Ungani Facility.

2.1. Existing Infrastructure

The existing infrastructure at the Ungani Facility includes:

- Bunded three phase (oil, produced water and gas) production separator.
- Various storage tanks.
- Impermeable lined Turkeys Nests.
- Road tanker load out facility.
- Various drum stands containing engine and hydraulic oil, and chemicals for injection.
- Plant processing and well control systems.
- Produced water injection equipment.
- Other equipment including generators, lighting towers, reverse osmosis plant and office.
- Camp site including accommodation and kitchen.

2.2. Stages and Timing

The extended production test at the Ungani Facility commenced in December 2013 and will operate for approximately 20 months until a production licence is granted. The Activity will include the following key stages:

1. Installation of additional equipment, including minor modifications to the existing facilities.
2. Continue extended production testing.
3. Process and separate crude oil, water and gas.
4. Management of produced water.
5. Transfer extracted crude oil to storage facilities then offsite.

2.3. Production Process

To date during the extended production test, the oil-water mix flows under reservoir pressure from the Ungani 1 ST1 and Ungani 2 wells. The oil-water mix from the wells flows to the production separator with oil flowing to the stock tanks while produced water is trapped and flows to the segregation tank and then water storage tanks, or straight to the water storage tanks. The limited gas given off during the separation process is released via the cold vent system. Typical production rates are given in Table 2.

Table 2: Typical production rates.

Parameter	Design Capacity	
Steady state daily production rate	Up to 286 kL crude	Up to 1,800 bbl crude
Crude oil storage capacity	556 kL	3,500 bbl
Hourly crude truck loading rate	48 kL	300 bbl
Production period	Up to 20 months	

2.3.1. Produced Water Management

Produced water will consist of up to approximately 30% of the oil water mix produced from the Ungani wells. The primary method for disposal of produced water will be via reinjection into Ungani 3 well. Evaporation from the Ungani 3 Turkeys Nest will also be used as a contingency produced water management measure. Storage in the Ungani Central and disposal at a licensed facility may also be used as contingency measures.

All chemicals within the produced water reinjected to Ungani 3 have been fully disclosed in accordance with Regulation 15(9) of the *Petroleum and Geothermal Energy Resources (Environment) Regulations 2012* and Chemical Disclosure Guideline published by DMP, in Appendix A.

2.3.1.1. Enhanced Evaporation Trial

The trial of enhanced evaporation of produced water from the Ungani 3 Turkeys Nest was approved by DMP in September 2014. However, due to operational priorities and limited volumes of water produced by the Ungani Facility, the trial to date has been limited. For this reason the trial has been extended until 31 March 2015.

2.4. Inspection and Maintenance

The Ungani Facility is a manned facility and daily inspections of the Ungani Facility will be undertaken. This includes collecting reinjection process data, evaporated water volumes, monitoring tank and Turkeys Nest levels (if applicable), and system integrity checks.

Maintenance operations include, but are not limited to, routine operations such as water injection filter changes, and greasing and topping up oil on rotating equipment (pumps). Maintenance of the Ungani access track will be through a scheduled proactive program dependant on traffic loads. Similar maintenance may be required on the well sites.

Wellhead maintenance operations may be undertaken which include wellhead maintenance, safety valve leak testing and well monitoring. The Company may also undertake wireline, slickline or e-line operations as part of the ongoing extended production testing. No chemicals will be required downhole for these operations.

2.5. Waste

All putrescible wastes will be stored at the well site or camp site in lidded skips/bins which remain closed to prevent fauna access and litter generation. Inert recyclable and industrial waste will be stored in skips. All waste types (putrescible, inert, recyclable and industrial) will be removed from the Ungani Facility and disposed offsite by an approved waste disposal contractor.

Sewage and grey water at the Ungani facility is treated by an Aerated Wastewater Treatment System. Following treatment, effluent will be discharged via a covered leach trench or sprinkler system into a fenced area which will prevent access by fauna.

Waste oil that has been contaminated with solids and is unsuitable for recovery will be stored in wheelie bins prior to disposal at a licenced landfill facility. Any hydrocarbon contaminated materials will be stored in wheelie bins before removal offsite. Empty chemical drums the removed offsite for disposal.

2.6. Demobilisation and Rehabilitation

No demobilisation is planned as part of the Activity. Following successful completion of the extended production test, the Company proposes to develop the Ungani Facility into Phase 2. The Company will seek the appropriate approvals prior to commencing Phase 2.

If some of the infrastructure at the Ungani Facility is no longer required then progressive decommissioning and remediation will be implemented. Alternatively, if Phase 2 of the Ungani Facility is not developed, a decommissioning and rehabilitation plan will be developed for DMP's approval and in consultation with all relevant stakeholders.

3. ENVIRONMENTAL IMPACTS AND MANAGEMENT MEASURES

The Activity will be confined to the Activity area. A summary of the existing environmental characteristics of the Activity area, potential impacts that could result from the Activity and the risk of these potential impacts occurring is provided in Table 3. Included in this table are also the management and mitigation measures that form part of the implementation strategy to minimise environmental risk.

Table 3: Summary of the existing environment, potential impacts and management approach associated with the Activity.

Environmental characteristic	Description	Potential Impact	Key Management Measures	Risk	Implementation Strategy
Surface water	<p>The access track to the Ungani Facility is within the Cape Leveque Coast Basin while the Ungani Facility is located in the Fitzroy River Catchment.</p> <p>The Fitzroy River, 53 km from the Ungani Facility, is the largest water course in the vicinity of the Activity area. No permanent water bodies are located in the vicinity of the Activity area and drainage lines are internally draining, only flowing to the Fitzroy River under flood conditions. During the wet season, sheet flow can occur due to the low lying topography of the Activity area.</p>	<ul style="list-style-type: none"> Contamination of surface water. 	<ul style="list-style-type: none"> Vehicles limited to the Activity area, travel in accordance with the <i>Travel Management Procedure</i> (HSE-PRO-002). Operations will spill risks undertaken in bunded areas or over drip trays. Installation of a flowline to Ungani 3 to reduce handling of produced water. Commissioning of flowline will be a manned operation, including inspection of the complete length of the flowline for leaks. The facility will be shut in before the maximum capacity of oil and water all storage is reached. Waste will be managed and monitored in accordance with the <i>Waste Monitoring and Management Procedure</i> (HSE-PR-005). Dangerous and hazardous goods will be stored within bunded areas. Dangerous goods labelled in accordance with regulations and MSDS. Refuelling of vehicles in accordance with the <i>Refuelling Procedure</i> (HSE-PR-011). Well maintained machinery, vehicles and equipment. Various inspections of the Activity area and equipment (including daily and weekly inspections). Suitably trained personnel. All downhole chemicals have been disclosed (Appendix A). Instrumentation will be installed for monitoring water injection. Quantity and quality of the produced water is monitored regularly. Any unevaporated water or leaks from evaporator contained within the Turkeys Nest. Containment, clean-up and remediation if required of a spill in accordance with the <i>Canning Basin Spill Response Plan</i> (HSE-ICM-009). For operations during the wet season: <ul style="list-style-type: none"> Forecasts monitored and site rain gauge checked daily. Shelters will be provided over chemical storage location(s). Tanks, flow lines, load out facility and bunding inspected following high rainfall events. Following high rainfall events, bunds are inspected for the presence of contaminated water and then discharged onto the firebreak or disposed of appropriately. 	Given the mitigation and management measures that will be implemented, alteration to surface water is unlikely.	<ul style="list-style-type: none"> Person In Charge (PIC) to ensure no personnel or vehicle access outside of the Activity area. PIC to ensure well site is fenced and gate closed. Civil Manager to ensure maintenance operations prevents an unstable soil surface. PIC to ensure wastes are appropriately stored prior to disposal. PIC to complete weekly operational checklist. PIC to ensure all dangerous goods or hazardous substances are transported, stored and handled to prevent spills. PIC to ensure all physical containment measures are well maintained. PIC to ensure well maintained machinery, vehicles and equipment. PIC to ensure quarterly groundwater sampling is conducted. Supervision of operations by personnel with well control certification. Supervision of the evaporator trials by PIC. Inspection of the evaporator trials by Buru Environment personnel.
Geology, Landforms and Soil	<p>The Activity area is located in the Fitzroy Trough, a major subdivision of the Canning Basin, and the Dampierland Interim Biogeographic Regionalisation of Australia bioregion. The geology and soils characteristic of the Dampierland bioregion are comprised of extensive riverine plains with grey and brown cracking clays; extensive sandplains or red earthy sands, low uplands of sandstone and limestone with shallow stony soils.</p> <p>The area around the existing Activity area is comprised of a series of sand sheets intersected by alluvial flood plains that are either no longer active or not frequently inundated.</p>	<ul style="list-style-type: none"> Soil erosion, sedimentation or compaction. Potential contamination of soil. Soil erosion and sedimentation at the Ungani firebreak. 		Given the mitigation and management measures that will be implemented, soil contamination and erosion is unlikely.	<ul style="list-style-type: none"> Weekly inspection of the leach trench and sprinkler system. Internal environmental audit. Flowlines inspected daily for leaks. Evaporator inspected daily. Turkeys Nests inspected daily.
Groundwater	<p>The major aquifer used by stations in the vicinity of the Activity is the Wallal Sandstone. The Wallal Sandstone is intersected at depths of between 130 m and 200 m below ground level (BGL) by the Activity area. The groundwater bore at the Ungani Facility accesses this aquifer at 140 m BGL. The Ungani 1 ST1 and Ungani 2 wells are open to formation at over 2,100 m BGL.</p> <p>The nearest water bore operated by a third party is approximately 11 km to the west. The closest drainage area to the Activity is a small drainage depression about 9 km north.</p>	<ul style="list-style-type: none"> Potential contamination of groundwater and aquifer 		Given the mitigation and management measures that will be implemented, groundwater contamination is considered unlikely.	<ul style="list-style-type: none"> PIC to ensure well maintained firebreaks and firefighting equipment, regular servicing of machinery and equipment, and limiting smoking to designated areas. PIC to ensure no personnel or vehicle access outside of the Activity area. Civil Manager to ensure all earthmoving machinery/ equipment is checked prior to entering the Activity area. Civil Manager to ensure gravel is weed free. Weekly inspection of the Activity area. Monitoring of fire risks in the Activity area.
Vegetation and Flora	<p>Within Dampierland the vegetation is characterised by the pindan formation which occurs on sand plains. Pindan is described by as a "grassland wooded by a sparse upper layer of trees and a dense, thicket-forming middle layer of unarmed, phyllodal <i>Acacia</i>".</p> <p>Two taxa recorded during an on-ground survey in the vicinity of the Activity area, <i>Goodenia byrnesii</i> and <i>G. crenata</i>, are ranked by DPAW as priority three.</p>	<ul style="list-style-type: none"> Potential loss of a local population of a conservation significant flora species. Loss of native flora. 		Given that no clearing is required and through the implementation of management measures, it is unlikely that the Activity will have a significant impact on flora and vegetation.	<ul style="list-style-type: none"> PIC to ensure well maintained firebreaks and firefighting equipment, regular servicing of machinery and equipment, and limiting smoking to designated areas. PIC to ensure no personnel or vehicle access outside of the Activity area. Civil Manager to ensure all earthmoving machinery/ equipment is checked prior to entering the Activity area. Civil Manager to ensure gravel is weed free. Weekly inspection of the Activity area. Monitoring of fire risks in the Activity area.
Environmentally Sensitive Areas (ESAs)	<p>The nearest ESAs are the Edgar Range Red Book area (1.6km south of the Ungani1 ST1 and 2 Facility) and Taylor's Lagoon, a gazetted ESA, approximately 30 km to the North West of the Ungani Facility.</p>	<ul style="list-style-type: none"> Potential loss of environmental values associated with ESA. 	<ul style="list-style-type: none"> No clearing of vegetation is required. Vehicle and personnel access will be limited to the Activity area. Earthmoving machinery and equipment will be inspected and cleaned. Externally sourced gravel will be weed free. Vehicles comply with the <i>Travel Management to Procedure</i> (HSE-PRO-002). Vehicles and machinery will be regularly maintained and undergo a pre-start check. Various inspections of the Activity area and equipment (including daily and weekly inspections). Following installation of the evaporator, trials will be undertaken using bore water and produced water. A procedure for ongoing operation the evaporator will be developed. Firebreak will be inspected and maintained. Smoking restricted to designated smoking areas. Firefighting equipment located at camp site and operational personnel trained in its use. The Company will notify DMP of any decommissioning planned and develop a decommissioning and rehabilitation plan. 	Given that no clearing is required and through the implementation of management measures, it is unlikely ESAs will be impacted.	

Ungani Evaporation Trial Extension and Additional Chemical Disclosure EP BD: Summary Document

Environmental characteristic	Description	Potential Impact	Key Management Measures	Risk	Implementation Strategy
Fauna	The only of fauna of conservation significance sighted during surveys in the vicinity of the Activity area were the Australian Bustard (<i>Ardeotis australis</i>) and the grey falcon. No feral fauna was identified, nor were any signs (tracks, scats, diggings) noted.	<ul style="list-style-type: none"> Loss of a local population of a conservation significant fauna species. Death or injury of fauna. Loss of conservation significant fauna habitat 	<ul style="list-style-type: none"> Broome Veterinary Hospital or Department of Parks and Wildlife Wildcare Helpline will be contacted if any fauna becomes injured. Yellow lights to be used, where operationally practicable. Well maintained and muffled equipment and machinery. Egress path in the Turkeys Nest visually inspected and repaired as required. Well sites fenced and gated to prevent access by macro-fauna and cattle. Storage tanks have a meter and gauge attached to detect gas levels from the tank. Gas volumes measured in the separator with flow meter. Additional releases estimated. Bore water sourced from existing water bore or Turkeys Nest for dust suppression, as required. Camp site arranged with internally lit walkways to minimise light spill. 	Given that no clearing is required and through the implementation of management measures, it is unlikely that the Activity will have a significant impact on fauna species.	<ul style="list-style-type: none"> PIC to ensure low light sources (i.e. yellow lights) are used at the well site and camp site, where operationally practicable. Weekly inspection of fauna egress paths and fencing. Weekly inspection for impacts outside of the Activity area. Internal environmental audit.
Social	The Activity is located within a sparsely populated region with limited settlement, transport or communications infrastructure. Land use is dominated by open range pasture grazing of beef stock. The townships of Derby to the northeast and Broome 100 km to the west are the largest population centres in the vicinity of the Activity. The nearest Homestead is Yakkamunga approximately 30 km east of the Activity.	<ul style="list-style-type: none"> Disturbance of livestock Disturbance of local landholders 	<ul style="list-style-type: none"> On-going consultation with local landholders and other stakeholders including regular notice/updates until completion of the Activity. Vehicles will comply with the <i>Travel Management Procedure</i> (HSE-PRO-002). 	Through the implementation of management measures, it is unlikely that the Activity will have an impact on Social aspects.	<ul style="list-style-type: none"> PIC to ensure no disturbance outside of Activity area. Weekly inspection for impacts outside of the Activity area.
Cultural	<p>A search in August 2014 of the Aboriginal Heritage Inquiry System maintained by the Department of Aboriginal Affairs showed no registered Aboriginal sites or other heritage places at or near to the Ungani Facility or along the access track.</p> <p>Heritage surveys and clearances for the Ungani Facility have been undertaken by representatives of the Nyikina Mangala native title claimants and an anthropologist engaged by the Traditional Owners.</p>	<ul style="list-style-type: none"> Damage to cultural heritage site/s or object/s. 	<ul style="list-style-type: none"> Vehicle and personnel activity will be limited to the Activity area. No clearing as part of the Activity. 	Given that no clearing is required and through the implementation of management measures, it is unlikely that the Activity will have an impact on cultural heritage site/s or object/s.	<ul style="list-style-type: none"> PIC to ensure no disturbance outside of Activity area. Weekly inspection of the Activity area for impacts outside of the Activity area.

4. COMMUNICATION

The Company has engaged in communication and consultation with relevant stakeholders as summarised in the Environment Plan. As the Activity is located within a sparsely populated region with limited settlement, transport or communications infrastructure, relevant stakeholders are limited to government departments, traditional owners and pastoralists.

No issues have been raised in relation to the Activity through the consultation process. The Company will continue to communicate with stakeholders and consult during all phases of the Activity, on a formal and informal basis, and by email, letter, face-to-face and telephone.

Appendix A

Chemical Disclosure and Relevant MSDS

CHEMICAL DISCLOSURE FOR BURU ENERGY

A. SYSTEM DETAILS:

OPERATOR:	Buru Energy
PROJECT / WELL:	Ungani Extended Production Test
SYSTEM:	Produced Water Disposal
TOTAL VOLUME OF SYSTEM:	98,000 L/day

B. PRODUCT LIST:

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	MSDS Attached
CRW24006	BHI	Corrosion Inhibitor	<p>This product contains organic components.</p> <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> COMPONENT 1 (30 – 60% concentration) Natural product – exempt under the Chemical Disclosure Guidelines COMPONENT 2 (10 – 30% concentration) <ul style="list-style-type: none"> Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 0.08 mg/L Method: ISO Draft International Standard Specie: <i>Acartia tonsa</i> (Marine invertebrate) Lethal Concentration 50%, 48 hrs 5.00 mg/L Method: ISO/CD 14669 & PARCOM Ring Test Specie: Sheepshead Minnow (Marine fish) Lethal Concentration 50%, 96 hours 	~ 0.0031	Yes

Chemical Disclosure
DMP approved format

			<p>2.30 mg/L Method: OECD 203 / PARCOM Part B</p> <ul style="list-style-type: none"> • COMPONENT 3 (10 – 30% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Desmodesmus subspicatus</i> (Freshwater algae) Effective Concentration 50%, 96 hours > 100 mg/L Method: OECD 201 ○ Specie: <i>Daphnia magna</i> (Freshwater invertebrate) Effective Concentration 50%, 48 hrs > 100 mg/L Method: OECD 202 ○ Specie: Bluegill Sunfish (Freshwater fish) Lethal Concentration 50%, 96 hours 2.30 mg/L Method: OECD 203 / PARCOM Part B • COMPONENT 4 (5 – 10% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Chlorococcales</i> (Freshwater algae) Effective Concentration 50% (Duration not available) 105 mg/L ○ Specie: <i>Daphnia magna</i> (Freshwater invertebrate) Effective Concentration 50% (Duration not available) 65.0 mg/L ○ Specie: <i>Oncorhynchus mykiss</i> (Freshwater fish) Lethal Concentration 50%, 96 hours > 300.82 mg/L Method: OECD 203 • COMPONENT 5 (1 – 5% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 0.20 mg/L Method: ISO Draft International Standard 		
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Chemical Disclosure
DMP approved format

			<ul style="list-style-type: none"> ○ Specie: <i>Acartia tonsa</i> (Marine invertebrate) Lethal Concentration 50%, 48 hrs 0.30 mg/L Method: ISO/CD 14669 & PARCOM Ring Test ○ Specie: Sheepshead Minnow (Marine fish) Lethal Concentration 50%, 96 hours 1.30 mg/L Method: OECD 203 / PARCOM Part B ● COMPONENT 6 (1 – 5% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Pseudokirchnerella subcapitata</i> (Freshwater algae) Effective Concentration 50%, 72 hours 27.0 mg/L Method: OECD 201 ○ Specie: <i>Daphnia magna</i> (Freshwater invertebrate) Effective Concentration 50%, 48 hrs 38.0 mg/L Method: OECD 202 ○ Specie: <i>Oncorhynchus mykiss</i> (Freshwater fish) Lethal Concentration 50%, 96 hours > 100 mg/L Method: OECD 203 ● COMPONENT 7 (0.1 – 1% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Scenedesmus quadricauda</i> (Freshwater algae) Toxicity threshold, 7 days 1,800 mg/L ○ Specie: <i>Daphnia magna</i> (Freshwater invertebrate) Lethal Concentration 50%, 24 hours >10,000 mg/L Method: OECD 202 ○ Specie: <i>Pimephales promelas</i> (Freshwater fish) Lethal Concentration 50%, 96 hours 9,640 mg/L Method: U.S. EPA Methods for Toxicity Tests with Aquatic Organisms, 1975 		
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Chemical Disclosure
DMP approved format

			<ul style="list-style-type: none"> • COMPONENT 8 (0.1 – 1% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Pseudokirchnerella subcapitata</i> (freshwater algae) Effective Concentration 50%, 72 hrs 1,164 mg/L Method: OECD 201 ○ Specie: <i>Daphnia magna</i> (freshwater invertebrate) Effective Concentration 50%, 48 hrs 64.6 mg/L Method: EU Method C.2 ○ Specie: <i>Poecilia reticulata</i> (freshwater fish) Lethal Concentration 50%, 96 hours 430 mg/L Method: EU Method C.1 <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) Natural product – exempt under the Chemical Disclosure Guidelines • COMPONENT 2 (10 – 30% concentration) Method: OECD 117 (HPLC) Log Pow 1.87 – 4.47 • COMPONENT 3 (10 – 30% concentration) Method: OECD 117 (HPLC) Log Pow 1.0 • COMPONENT 4 (5 – 10% concentration) Log Pow -0.17 • COMPONENT 5 (1 – 5% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition 		
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Chemical Disclosure
DMP approved format

			<p>Method: OECD 117 (HPLC) Log Pow -0.85 – 1.35</p> <ul style="list-style-type: none"> • COMPONENT 6 (1 – 5% concentration) Method: OECD 117 (HPLC) Shake Flask Log Pow -2.99 • COMPONENT 7 (0.1 – 1% concentration) Method: OECD 117 (HPLC) Log Pow < 1.0 • COMPONENT 8 (0.1 – 1% concentration) Method: Calculation Log Pow -1.58 at pH > 12 -5.58 at pH 7 <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) Natural product – exempt under the Chemical Disclosure Guidelines • COMPONENT 2 (10 – 30% concentration) Method: OECD 306 Biodegradability, 28 days 45% • COMPONENT 3 (10 – 30% concentration) Method: OECD 301C Biodegradability, 28 days 85% • COMPONENT 4 (5 – 10% concentration) Method: OECD 301D Biodegradability, 28 days 72% 		
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Chemical Disclosure
DMP approved format

			<ul style="list-style-type: none"> • COMPONENT 5 (1 – 5% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition Method: OECD 301D Biodegradability, 14 days 100% • COMPONENT 6 (1 – 5% concentration) Method: OECD 301D Biodegradability, 28 days 67% • COMPONENT 7 (0.1 – 1% concentration) Method: OECD 301D Biodegradability, 28 days 76% • COMPONENT 8 (0.1 – 1% concentration) Method: OECD 301D Biodegradability, 21 days 87% <p>ACUTE MAMMALIAN TOXICITY</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) Natural product – exempt under the Chemical Disclosure Guidelines • COMPONENT 2 (10 – 30% concentration) Specie: Rat LD50 (oral) > 4,000 mg/kg • COMPONENT 3 (10 – 30% concentration) Specie: Mouse (fasted animals) LD50 (oral) 2,410 mg/kg • COMPONENT 4 (5 – 10% concentration) Specie: Rat LD50 (oral) 		
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			<p>3,310 mg/kg</p> <ul style="list-style-type: none"> • COMPONENT 5 (1 – 5% concentration) Specie: Mouse LD50 (oral) 150 – 340 mg/kg • COMPONENT 6 (1 – 5% concentration) Specie: Rat LD50 (oral) 73 mg/kg • COMPONENT 7 (0.1 – 1% concentration) Specie: Rat LD50 (oral) 5,840 mg/kg • COMPONENT 8 (0.1 – 1% concentration) Specie: Rat LD50 (oral) 1,553 mg/kg <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>		
TRETOLITE™ DMO24900	BHI	Demulsifier	<p>This product contains organic components.</p> <p>AQUATIC TOXICOLOGY</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 67.1 mg/L Method: ISO/DIS 10253 	~ 0.0071	Yes

Chemical Disclosure
DMP approved format

			<ul style="list-style-type: none"> ○ Specie: <i>Acartia tonsa</i> (Marine invertebrate) Lethal Concentration 50%, 48 hrs 161 mg/L Method: ISO 14669:1999 € ○ Specie: <i>Pimephales promelas</i> (Freshwater fish) Lethal Concentration 50%, 96 hours < 10 mg/L ● COMPONENT 2 (10 – 30% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 6.30 mg/L Method: ISO/DIS 10253 ○ Specie: <i>Acartia tonsa</i> (Marine invertebrate) Lethal Concentration 50%, 48 hrs 23.5 mg/L Method: ISO 14669:1999 € ○ Specie: <i>Cyprinodon variegatus</i> (Marine fish) Lethal Concentration 50%, 96 hours 1,024 mg/L Method: PARCOM, 1995 ● COMPONENT 3 (10 – 30% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 19.8 mg/L Method: ISO/DIS 10253 ○ Specie: <i>Acartia tonsa</i> (Marine invertebrate) Lethal Concentration 50%, 48 hrs 35.4 mg/L Method: ISO 14669 ○ Specie: <i>Cyprinodon variegatus</i> (Marine fish) Lethal Concentration 50%, 96 hours 324 mg/L Method: PARCOM, 1995 ● COMPONENT 4 (5 – 10% concentration) 		
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Chemical Disclosure
DMP approved format

			<ul style="list-style-type: none"> ○ Specie: <i>Desmodesmus subspicatus</i> (Freshwater algae) Effective Concentration 50%, 72 hours 16.6 mg/L Method: EU Method C.3 ○ Specie: <i>Daphnia magna</i> (Freshwater invertebrate) Lethal Concentration 50%, 48 hrs 39.0 mg/L Method: EU Method C.2 ○ Specie: <i>Pimephales promelas</i> (Freshwater fish) Lethal Concentration 50%, 96 hours 28.2 mg/L Method: OECD 203 ● COMPONENT 5 (1 – 5% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 3.40 mg/L Method: ISO/DIS 10253 ○ Specie: <i>Acartia tonsa</i> (Marine invertebrate) Lethal Concentration 50%, 48 hrs 9.00 mg/L Method: ISO 14669 ○ Specie: <i>Cyprinodon variegatus</i> (Marine fish) Lethal Concentration 50%, 96 hours > 1,000 mg/L Method: PARCOM, 1995 ● COMPONENT 6 (1 – 5% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Chlorococcales</i> (Freshwater algae) Effective Concentration 50%, 24 hours 100 mg/L ○ Specie: <i>Daphnia magna</i> (Freshwater invertebrate) Lethal Concentration 50%, 24 hrs 150 mg/L ○ Specie: <i>Pimephales promelas</i> (Freshwater fish) Lethal Concentration 50%, 96 hours 		
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Chemical Disclosure
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			<p>42.0 mg/L</p> <ul style="list-style-type: none"> • COMPONENT 7 (1 – 5% concentration) <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine algae) Effective Concentration 50%, 72 hours 0.85 mg/L Method: ISO 10253: 2006€ ○ Specie: <i>Chironomus riparius</i> (Freshwater invertebrate) Lethal Concentration 50%, 96 hrs 6.50 mg/L ○ Specie: <i>Lepomis macrochirus</i> (Freshwater fish) Lethal Concentration 50%, 96 hours 1.67 mg/L Method: US EPA 850.1075, 1996 <p>CHEMICAL FATE</p> <p>Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition Method: OECD 117 (HPLC) Log Pow 2.66 – 4.90 • COMPONENT 2 (10 – 30% concentration) Not applicable to surfactants • COMPONENT 3 (10 – 30% concentration) Not applicable to surfactants • COMPONENT 4 (5 – 10% concentration) Method: OECD 117 (HPLC) Log Pow 2.8 • COMPONENT 5 (1 – 5% concentration) Not applicable to surfactants • COMPONENT 6 (1 – 5% concentration) 		
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Chemical Disclosure
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			<p>Method: OECD 117 (HPLC) Log Pow 3.2 – 3.5</p> <ul style="list-style-type: none"> • COMPONENT 7 (1 – 5% concentration) Method: OECD 117 (HPLC) Log Pow 2.28 <p>ENVIRONMENTAL FATE</p> <p>Ready Biodegradability</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition Method: OECD 306 Biodegradability 28 days 62% • COMPONENT 2 (10 – 30% concentration) Method: BODIS Biodegradability 28 days 17% • COMPONENT 3 (10 – 30% concentration) Method: OECD 306 Biodegradability 28 days 27% • COMPONENT 4 (5 – 10% concentration) Method: OECD 301D Biodegradability 28 days 99% • COMPONENT 5 (1 – 5% concentration) Method: BODIS Biodegradability 28 days 5% • COMPONENT 6 (1 – 5% concentration) 		
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Chemical Disclosure
DMP approved format

			<p>Method: OECD 306 / ISO 10634 Biodegradability 28 days 73%</p> <ul style="list-style-type: none"> • COMPONENT 7 (1 – 5% concentration) Method: OECD 301D Biodegradability 28 days 100% <p>ACUTE MAMMALIAN TOXICITY</p> <ul style="list-style-type: none"> • COMPONENT 1 (30 – 60% concentration) No scientific data or research is available for this component. Data are presented for a comparable product, which is no less than 95% similar in composition Specie: Rat Lethal Dose 50% (oral) 7,050 mg/kg • COMPONENT 2 (10 – 30% concentration) No scientific data or research is available for this component. Data are presented for a comparable product. Specie: Rat Lethal Dose 50% (inhalation) 147 mg/m³ • COMPONENT 3 (10 – 30% concentration) No scientific data or research is available for this component. • COMPONENT 4 (5 – 10% concentration) Specie: Rat Lethal Dose 50% (oral) 2,047 mg/kg • COMPONENT 5 (1 – 5% concentration) No scientific data or research is available for this component. Data are presented for a comparable product. Specie: Mouse Lethal Dose 50% (oral) 1,600 mg/kg 		
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Chemical Disclosure
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			<ul style="list-style-type: none"> COMPONENT 6 (1 – 5% concentration) Specie: Rat Lethal Dose 50% (oral) 4,300 mg/kg COMPONENT 7 (1 – 5% concentration) Specie: Rat Lethal Dose 50% (oral) 1,470 mg/kg <p>CHRONIC TOXICITY</p> <ul style="list-style-type: none"> This product carries the following classification: <ul style="list-style-type: none"> R40 – Limited evidence of a carcinogenic effect This product does not carry any of the following R phrases for carcinogenic (R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects for this product. 		
OSW24514	BHI	Oxygen Scavenger	<p>AQUATIC TOXICOLOGY</p> <p>Static Acute Freshwater Toxicity</p> <ul style="list-style-type: none"> Specie: <i>Ceriodaphnia dubia</i> Effective Concentration 50%, 24 hours 234 mg/L Effective Concentration 50%, 48 hours 170 mg/L Lethal Concentration 50%, 24 hours 259 mg/L Lethal Concentration 50%, 48 hours 165 mg/L No Observable Effect Concentration, 48 hours < 117 mg/L Method: EPA-821-R-02-012 Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive 	~ 0.0031	Yes

Chemical Disclosure
DMP approved format

			<p>Comment: Vessels not aerated</p> <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> Effective Concentration 50%, 24 hours 210 mg/L Effective Concentration 50%, 48 hours 125 mg/L Lethal Concentration 50%, 24 hours 288 mg/L Lethal Concentration 50%, 48 hours 151 mg/L No Observable Effect Concentration, 48 hours < 117 mg/L Method: EPA-821-R-02-012 Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive Comment: Vessels not aerated <p>Static Acute Renewal Freshwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: Fathead Minnow (<i>Pimephales promelas</i>) Effective Concentration 50%, 48 hours 298 mg/L Effective Concentration 50%, 96 hours 259 mg/L Lethal Concentration 50%, 48 hours 639 mg/L Lethal Concentration 50%, 96 hours 639 mg/L No Observable Effect Concentration, 96 hours 117 mg/L Method: EPA-821-R-02-012 Temperature: 20°C Renewal: 48 hours Sample Prep: Water Soluble Stock 		
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Chemical Disclosure
DMP approved format

			<p>Test Procedure: Definitive Comment: Vessels were not aerated</p> <p>Static Acute Saltwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: Threespine stickleback (<i>Gasterosteus aculeatus</i>) Lethal Concentration 50%, 96 hours 206 mg/L Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive Comment: Vessels were not aerated ○ Specie: Threespine stickleback (<i>Gasterosteus aculeatus</i>) Lethal Concentration 50%, 96 hours 393 mg/L Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive Comment: Vessels were aerated • Comment: Algal toxicity data are not available for this product. <p>ENVIRONMENTAL FATE Not applicable to inorganic compounds.</p> <p>ACUTE MAMMALIAN TOXICITY Not applicable to inorganic compounds.</p> <p>ACUTE MAMMALIAN TOXICITY Specie: Rat Method: OECD 401 Observation Period: 14 Days Lethal Dose 50% (oral) ~ 2,610 mg/kg Comment No scientific data or resarch is available for this active. Data are</p>		
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Chemical Disclosure
DMP approved format

			presented for a similar chemistry.		
			<p>CHRONIC TOXICITY</p> <p>No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects are associated with this product.</p>		
TRETOLITE™ RBW24136	BHI	Water Clarifier	<p>This product contains organic components.</p> <p>AQUATIC TOXICOLOGY</p> <p>Static Acute Saltwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: <i>Acartia tonsa</i> Lethal Concentration 10%, 48 hours 2.16mg/L Lethal Concentration 50%, 48 hours 3.40 mg/L Lethal Concentration 90%, 48 hours 11.2 mg/L No Observable Effect Concentration, 48 hours 0.80 mg/L Method: ISO/CD 14669 & PARCOM Ring Test Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive ○ Specie: <i>Skeletonema costatum</i> Effective Concentration 50%, Biomass, 48 hours 2.00 mg/L Effective Concentration 50%, Growth Rate, 48 hours 2.20 mg/L Effective Concentration 50%, Biomass, 72 hours 2.00 mg/L Effective Concentration 50%, Growth Rate, 72 hours 3.20 mg/L 	~ 0.001	Yes

Chemical Disclosure
DMP approved format

			<p>Method: ISO Draft International Standard Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Algal Assay</p> <ul style="list-style-type: none"> ○ Specie: <i>Corophium volutator</i> Lethal Concentration 50%, 10 days 1,150 mg/L Method: PARCOM, 1994 Temperature: 15°C Renewal: None Sample Prep: Mixed with wet sediment Test Procedure: Definitive ○ Specie: <i>Photobacterium phosphoreum</i> Effective Concentration 50%, 15 minutes 1,176 mg/L Effective Concentration 50%, 5 minutes 916 mg/L Temperature: 15°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Microtox ○ Specie: <i>Scophthalmus maximus</i> Lethal Concentration 50%, 24 hours 776 mg/L Lethal Concentration 50%, 48 hours 776 mg/L Lethal Concentration 50%, 72 hours 716 mg/L Lethal Concentration 50%, 96 hours 716 mg/L No Observable Effect Concentration, 96 hours 632 mg/L Method: PARCOM 1995, Part B 		
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Chemical Disclosure
DMP approved format

			<p>Temperature: 15°C Renewal: 48 hours Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <p>CHEMICAL FATE</p> <p>Method: HPLC (OECD 117) Detector: UV Log Pow Calculated: 2.6 Log Pow Range: 0 to 3.9 Log Pow < 0 95.0% 3 < Log Pow < 4 5.00%</p> <p>ENVIRONMENTAL FATE</p> <ul style="list-style-type: none"> Method: OECD 301D Biodegradability Type: Ready Media: Freshwater Test Concentration: 5 mg/L COD Value: 0.29 Reference: Sodium Acetate Reference Concentration: 2 mg/L Biodegradability 5 days 0% (reference = 64%) Biodegradability 13 days 14% (reference = 71%) Biodegradability 20 days 21% (reference = 83%) Biodegradability 28 days 14% (reference = 83%) Method: OECD 306 Biodegradability Type: Ready Media: Natural Seawater 		
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Chemical Disclosure
DMP approved format

			<p>Test Concentration: 9.8 mg/L ThOD Num: 0.35 Reference: Sodium Benzoate Reference Concentration: 2.5 mg/L Biodegradability 5 days 31% (reference = 68%, inhibitory action = 44%) Biodegradability 15 days 20% (reference = 81%, inhibitory action = 44%) Biodegradability 28 days 29% (reference = 82%, inhibitory action = 51%)</p> <p><u>ACUTE MAMMALIAN TOXICITY</u> Specie: Rat Lethal Dose 50% (oral) 273 mg/kg Comment: Acute oral toxicity of a component of this product. Acute mammalian toxicity studies on this product have not been conducted.</p> <p><u>CHRONIC TOXICITY</u> No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects associated with this product.</p>		
SCW24457	BHI	Scale Inhibitor	<p>This product contains organic components.</p> <p><u>AQUATIC TOXICOLOGY</u> Static Acute Renewal Saltwater Toxicity</p> <ul style="list-style-type: none"> Specie: <i>Scophthalmus maximus</i> Lethal Concentration 50%, 96 hours 8,667 mg/L No Observable Effect Concentration, 96 hours 3,889 mg/L Method: OECD 203 Temperature: 14-15°C 	~ 0.002	Yes

Chemical Disclosure
DMP approved format

			<p>Renewal: 48 hours Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <p>Static Acute Saltwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: <i>Acartia tonsa</i> Lethal Concentration 50%, 48 hours 2,800 mg/L No Observable Effect Concentration, 48 hours 1,556 mg/L Method: ISO/CD 14669 & PARCOM Ring Test Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive ○ Specie: <i>Skeletonema costatum</i> Effective Concentration 50%, Biomass, 72 hours 400 mg/L No Effect Concentration, Biomass, 72 hours 111 mg/L Method: ISO 10253 Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Algal Assay <p>CHEMICAL FATE</p> <p>Method: Calculated Log Pow: -2.84 Comment: Determined by calculation using the method of Hansch & Leo, based on the fragment method of Rekker.</p> <p>ENVIRONMENTAL FATE</p> <p>Method: OECD 301D Biodegradability Type: Ready</p>		
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Chemical Disclosure
DMP approved format

			<p>Media: Freshwater Test Concentration: 5 mg/L ThOD Num: 0.25 mg Reference: Sodium Acetate Reference Concentration: 2 mg/L Biodegradability 5 days 0% (reference = 64%) Biodegradability 13 days 8% (reference = 71%) Biodegradability 20 days 32% (reference = 83%) Biodegradability 28 days 24% (reference = 83%)</p> <p><u>ACUTE MAMMALIAN TOXICITY</u> Specie: Rat Method: OECD 401 Observation Period: 14 Days Lethal Dose 50% (oral) > 5,838 mg/kg Comment: LD50 > 5,838 as active salt</p> <p><u>CHRONIC TOXICITY</u> No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68), mutagenic (R46) or reproductive (R60, R61, R62, R63, R64) effects associated with this product.</p>		
XC24380	BHI	Biocide	<p>This product contains organic components.</p> <p><u>AQUATIC TOXICOLOGY</u> Static Acute Freshwater Toxicity <ul style="list-style-type: none"> Specie: <i>Daphnia magna</i> Lethal Concentration 50%, 48 hours 19.4 mg/L </p>	~ 0.0031	Yes

Chemical Disclosure
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			<p>Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <ul style="list-style-type: none"> ○ Specie: Bluegill Sunfish (<i>Lepomis macrochirus</i>) Lethal Concentration 50%, 96 hours 93.0 mg/L <p>Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <ul style="list-style-type: none"> ○ Specie: Rainbow trout (<i>Oncorhynchus mykiss</i>) Lethal Concentration 50%, 96 hours 119 mg/L <p>Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <p>Static Acute Renewal Freshwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: Fathead Minnow (<i>Pimephales promelas</i>) Lethal Concentration 50%, 24 hours > 26.6 mg/L Lethal Concentration 50%, 48 hours 15.1 mg/L Lethal Concentration 50%, 72 hours 4.90 mg/L Lethal Concentration 50%, 96 hours 2.90 mg/L No Observable Effect Concentration, 96 hours 0.80 mg/L Method: EPA-821-R-02-012 Temperature: 20°C Renewal: 48 hours Sample Prep: Water Soluble Stock Test Procedure: Definitive <p>Static Acute Renewal Saltwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: Mysid shrimp (<i>Americamysis bahia</i>) Lethal Concentration 50%, 48 hours 2.82 mg/L Lethal Concentration 50%, 96 hours 		
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Chemical Disclosure

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			<p>1.06 mg/L Lowest Observable Effect Concentration (7day survival) 1.25 mg/L Lowest Observable Effect Concentration (7day growth) > 0.63 mg/L Lowest Observable Effect Concentration, 48 hours 2.50 mg/L Lowest Observable Effect Concentration, 96 hours 1.25 mg/L No Observable Effect Concentration (7day survival) 0.63 mg/L No Observable Effect Concentration (7day growth) 0.63 mg/L No Observable Effect Concentration, 48 hours 1.25 mg/L No Observable Effect Concentration, 96 hours 0.63 mg/L Temperature: 26°C Renewal: Daily Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <ul style="list-style-type: none"> ○ Specie: <i>Scophthalmus maximus</i> Lethal Concentration 50%, 96 hours 72.5 mg/L No Observable Effect Concentration, 96 hours 41.0 mg/L Method: PARCOM 1995 Renewal: 48 hours Sample Prep: Water Soluble Stock Test Procedure: Definitive <p>Static Acute Saltwater Toxicity</p> <ul style="list-style-type: none"> ○ Specie: Mysid shrimp (<i>Americamysis bahia</i>) Lethal Concentration 50%, 48 hours 16.0 mg/L 		
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Chemical Disclosure
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			<p>No Observed Adverse Effect Concentration, 48 hours 5.80 mg/L Comment: No Observed Adverse Effect Concentration (NOAEC) is the highest concentration at which survival is not significantly different from the control. Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <ul style="list-style-type: none"> ○ Specie: Inland Silverside (<i>Menidia beryllina</i>) Lethal Concentration 50%, 48 hours 97.5 mg/L No Observed Adverse Effect Concentration, 48 hours 29.2 mg/L Comment: No Observed Adverse Effect Concentration (NOAEC) is the highest concentration at which survival is not significantly different from the control. Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive ○ Specie: <i>Skeletonema costatum</i> Effective Concentration 50%, 72 hours 0.16 mg/L Method: ISO 10253 Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive ○ Specie: <i>Acartia tonsa</i> Lethal Concentration 50%, 48 hours 0.60 mg/L Lethal Concentration 100%, 48 hours 0.85 mg/L 		
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Chemical Disclosure
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			<p>No Observed Effect Concentration, 48 hours 0.20 mg/L Method: ISO 14669 Temperature: 20°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive</p> <ul style="list-style-type: none"> ○ Specie: <i>Corophium volutator</i> Lethal Concentration 50%, 10 days 2,174 mg/L Method: PARCOM, 1994 Temperature: 15°C Renewal: None Sample Prep: Water Soluble Stock Test Procedure: Definitive <p><u>CHEMICAL FATE</u> Method: HPLC (OECD 117) Log Pow < 0 100%</p> <p><u>ENVIRONMENTAL FATE</u> Method: OPPTS 835.4300 Biodegradability Type: Ultimate Media: Freshwater Biodegradability 7 days 60% Comment: Study evaluated the aerobic metabolism of ¹⁴C labelled THPS. Test results are expressed as DT (Disappearance Time) i.e. 60% of THPS had disappeared in 7 days.</p> <p><u>ACUTE MAMMALIAN TOXICITY</u></p> <ul style="list-style-type: none"> ○ Specie: Rat 		
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Chemical Disclosure
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			<p>Observation Period: 14 Days Lethal Concentration 50% (inhalation) 0.59 mg/L Comment: 4 hour exposure</p> <ul style="list-style-type: none"> ○ Specie: Rat Observation Period: 14 Days Lethal Dose 50% (oral) 248 mg/kg <p>CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68) or mutagenic (R46) phrases are associated with this product. This product does carry an R61 "May cause harm to the unborn child" warning.</p>		
TRETOLITE™ RBW24122	BHI	Water Clarifier	<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) Static Acute Saltwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Acartia tonsa</i> (Crustacean) Lethal Concentration 50%, 48 hours 3,420 mg/L ○ Specie: <i>Skeletonema costatum</i> (Algae) Effective Concentration 50%, 96 hour 1,813 mg/L ○ Specie: <i>Cyprinodon variegatus</i> (Fish) Lethal Concentration 50%, 96 hour 13,230 mg/L <p>CHEMICAL FATE Octanol/Water Partition Coefficient</p> <ul style="list-style-type: none"> • COMPONENT 1 (60 – 100% concentration) 	~ 0.0051 (Contingency)	Yes

Chemical Disclosure
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			<p>Natural product – exempted under the Chemical Disclosure Guidelines.</p> <ul style="list-style-type: none"> COMPONENT 2 (30 – 60% 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 – 100% concentration) Natural product – exempted under the Chemical Disclosure Guidelines. COMPONENT 2 (30 – 60% concentration) Method: OECD 306 Biodegradability 28 days 3% <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) Specie: Rat Lethal Dose 50% (oral) > 5,000 mg/kg <p>CHRONIC TOXICITY No known carcinogenic (R40, R45, R49), chronic (R33, R39, R48, R68) and mutagenic (R46) effects are known for any components in this product.</p>		
TRETOLITE™ RBW24365	BHI	Water Clarifier	<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 (10 - 30% concentration) Static Acute Freshwater Toxicity 	~ 0.00306 (Contingency)	Yes

Chemical Disclosure
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			<ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 48 hours 38 mg/L ○ Specie: <i>Pseudokirchnerella subcapitata</i> (Algae) Effective Concentration 50%, 96 hours 14 mg/L ○ Specie: <i>Danio rerio</i> (Fish) Lethal Concentration 50%, 96 hours > 1,000 mg/L ● COMPONENT 3 (5 – 10% concentration) Static Acute Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 48 hours 0.14 mg/L ○ Specie: <i>Skeletonema costatum</i> (Marine Algae) Effective Concentration 50%, 96 hours 0.6 mg/L ○ Specie: <i>Pimephales promelas</i> (Fish) Lethal Concentration 50%, 96 hours 0.4 mg/L ● COMPONENT 4 (<0.1% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 48 hours 41,100 mg/L ○ Specie: <i>Pseudokirchnerella subcapitata</i> (Algae) Effective Concentration 50%, 96 hours > 6,500 – 13,000 mg/L ○ Specie: <i>Pimephales promelas</i> (Fish) Lethal Concentration 50%, 96 hours 72,860 mg/L ● COMPONENT 5 (<0.1% concentration) Static Acute Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) 		
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Chemical Disclosure
DMP approved format

			<p>Lethal Concentration 50%, 48 hours 0.33 mg/L</p> <ul style="list-style-type: none"> ○ Specie: <i>Skeletonema costatum</i> (Marine Algae) Effective Concentration 50%, 96 hours 0.15 mg/L ○ Specie: <i>Pimephales promelas</i> (Fish) Lethal Concentration 50%, 96 hours 0.1 mg/L <ul style="list-style-type: none"> ● COMPONENT 6 (<0.1% 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"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Effective Concentration 50%, 48 hours 230 mg/L ○ Specie: <i>Pseudokirchnerella subcapitata</i> (Algae) Effective Concentration 50%, 72 hours > 100 mg/L ○ Specie: <i>Oncorhynchus mykiss</i> (Fish) Lethal Concentration 50%, 96 hours 770 mg/L ● COMPONENT 7 (<0.1% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 48 hours 0.08 mg/L ○ Specie: <i>Skeletonema costatum</i> (Marine Algae) Effective Concentration 50%, 72 hours 0.08 mg/L ○ Specie: <i>Pimephales promelas</i> (Fish) Lethal Concentration 50%, 96 hours 0.35 mg/L ● COMPONENT 8 (<0.1% concentration) Static Acute Saltwater Toxicity 		
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Chemical Disclosure
DMP approved format

			<ul style="list-style-type: none"> ○ Specie: <i>Acartia tonsa</i> (Crustacean) Lethal Concentration 50%, 48 hours 27 mg/L ○ Specie: <i>Skeletonema costatum</i> (Algae) Effective Concentration 50%, 72 hours 62 mg/L ○ Specie: <i>Cyprinodon variegatus</i> (Fish) Lethal Concentration 50%, 96 hours 45 mg/L ● COMPONENT 9 (<0.1% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 48 hours >1,000 mg/L ○ Specie: <i>Scenedesmus quadricauda</i> (Algae) Effective Concentration 50%, 7days 1,800 mg/L ○ Specie: <i>Pimephales promelas</i> (Fish) Lethal Concentration 50%, 96 hours 9,640 mg/L ● COMPONENT 10 (<0.1% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Ceriodaphnia dubia</i> (Crustacean) Lethal Concentration 50%, 48 hours 5,012 mg/L ○ Specie: <i>Chlorella vulgaris</i> (Algae) Effective Concentration 50%, 4 days 675 mg/L ○ Specie: <i>Pimephales promelas</i> (Fish) Lethal Concentration 50%, 96 hours 14,200 mg/L <p>CHEMICAL FATE</p> <ul style="list-style-type: none"> ● COMPONENT 1 (60 - 100% concentration) 		
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Chemical Disclosure
DMP approved format

			<p>Natural product - exempted under the Chemical Disclosure Guidelines.</p> <ul style="list-style-type: none"> • COMPONENT 2 (10 – 30% concentration) Not Applicable to inorganic compounds. • COMPONENT 3 (5 – 10% concentration) Not Applicable to surfactants. Molecular weight > 700 • COMPONENT 4 (< 0.1% concentration) Method: OECD 117(HPLC) Log Pow < 0 • COMPONENT 5 (< 0.1% concentration) Not Applicable to surfactants. Molecular weight > 700 • COMPONENT 6 (< 0.1% concentration) Not Applicable to inorganic compounds. • COMPONENT 7 (< 0.1% concentration) Not Applicable to surfactants. • COMPONENT 8 (< 0.1% concentration) Not Applicable. Molecular weight > 700 • COMPONENT 9 (< 0.1% concentration) Method: OECD 117(HPLC) Log Pow <1.0 • COMPONENT 10 (< 0.1% concentration) Method: OECD 117(HPLC) Log Pow -0.35 <p>ENVIRONMENTAL FATE</p> <ul style="list-style-type: none"> • COMPONENT 1 (60 - 100% concentration) Natural product - exempted under the Chemical Disclosure Guidelines • COMPONENT 2 (10 - 30% concentration) Not Applicable to inorganic compounds. • COMPONENT 3 (5 - 10% concentration) Method: OECD 306 Biodegradability 28 days 		
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Chemical Disclosure
DMP approved format

			<p>13%</p> <ul style="list-style-type: none"> • COMPONENT 4 (< 0.1% concentration) Method: OECD 301A Biodegradability 10 days 90 - 100% • COMPONENT 5 (< 0.1% concentration) Method: OECD 306 Biodegradability 28 days 39% • COMPONENT 6 (< 0.1% concentration) Not Applicable to inorganic compounds. • COMPONENT 7 (< 0.1% concentration) Method: OECD 301B Biodegradability 28 days 96% • COMPONENT 8 (< 0.1% concentration) Method: OECD 306 Biodegradability 28 days 74% • COMPONENT 9 (< 0.1% concentration) Method: OECD OECD 301D Biodegradability 28 days 76% • COMPONENT 10 (< 0.1% concentration) Method: Other methods Biodegradability 20 days 84% <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 (10 – 30% concentration) Specie: rat Lethal Dose 50% (oral) 		
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Chemical Disclosure
DMP approved format

			<p>>2,000 mg/kg bw</p> <ul style="list-style-type: none"> • COMPONENT 3 (5 – 10% concentration) Specie: rat Lethal Dose 50% (oral) >2,000 mg/kg bw • COMPONENT 4 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) 5,500 mg/kg bw • COMPONENT 5 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) 1,970 mg/kg bw • COMPONENT 6 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) > 5,000 mg/kg bw • COMPONENT 7 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) 426 mg/kg bw • COMPONENT 8 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) >6,400 mg/kg bw • COMPONENT 9 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) 5,840 mg/kg bw • COMPONENT 10 (< 0.1% concentration) Specie: rat Lethal Dose 50% (oral) 10,470 mg/kg bw <p>* All mammalian toxicity values are based upon 100% active material</p>		
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Chemical Disclosure
DMP approved format

			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.		
XC24102	BHI	Biocide	This product contains organic components. AQUATIC TOXICOLOGY <ul style="list-style-type: none"> • COMPONENT 1 (60 - 100% concentration) Natural product - exempted under the Chemical Disclosure Guidelines. • COMPONENT 2 (10 – 30% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 48 hours 29.7 mg/L ○ Specie: <i>Scenedesmus subspicatus</i> (Algae) Effective Concentration 50%, 96 hours 1.2 mg/L ○ Specie: <i>Lepomis macrochirus</i> (Fish) Lethal Concentration 50%, 96 hours 13 mg/L • COMPONENT 3 (0.1– 1% concentration) Static Acute Freshwater Toxicity <ul style="list-style-type: none"> ○ Specie: <i>Daphnia magna</i> (Crustacean) Lethal Concentration 50%, 96 hours 18,260 mg/L ○ Specie: <i>Selenastrum capricornutum</i> (Algae) Effective Concentration 50%, 96 hours 22,000 mg/L ○ Specie: <i>Lepomis macrochirus</i> (Fish) Lethal Concentration 50%, 96 hours 15,400 mg/L 	~ 0.00204 (Contingency)	Yes

Chemical Disclosure
DMP approved format

			<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 (10 – 30% concentration) Method: OECD 117(HPLC) Log Pow < 0 • COMPONENT 3 (0.1– 1 % concentration) Method: OECD 117(HPLC) Log Pow -0.77 <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 (10- 30% concentration) Method: OECD 306 Biodegradability 28 days 73% • COMPONENT 3 (0.1– 1% concentration) Method: Other Methods Biodegradability 20 days 95% <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 (10 - 30% concentration) Specie: mouse Oral Lethal Dose 50%, 14 days 158 mg/kg bw. • COMPONENT 3 (0.1 - 1% concentration) 		
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Chemical Disclosure
DMP approved format

			Specie: rat. Oral Lethal Dose 50%, 14 days > 2,528mg/kg bw. 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	-	Water	-	~ 99.98	-
TOTAL				100%	

** With reference to biodegradation, where a Product is organic than Contractor must state as such in this column

Chemical Disclosure

DMP approved format

C. CHEMICAL LIST

Chemical List (Chemicals within fluid system identified in the table above)

Chemicals Name	CAS Number	Mass Fraction (%)
WATER	7732-18-5	99.983%
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE	55566-30-8	0.00323%
ALKYL (C3-5) BENZENES	64742-94-5	0.00286%
AMMONIUM BISULPHITE	10192-30-0	0.00219%
2-PROPENOIC ACID, HOMOPOLYMER, SODIUM SALT	9003-04-7	0.00155%
OXIRANE/METHYLOXIRANE COPOLYMER	9003-11-6	0.00143%
OXYALKYLATED RESINS	63428-92-2	0.00101%
POLYALUMINIUM CHLORIDE	1327-41-9	0.00078%
FATTY ACIDS, TALL OIL, REACTION PRODUCTS WITH DIETHYLENETRIAMINE	61790-69-0	0.00061%
GLUTARALDEHYDE	111-30-8	0.00054%
2-(2-BUTOXYETHOXY)ETHANOL	112-34-5	0.00039%
ETHYL HEXANOL	104-76-7	0.00034%
OXYALKYLATED AMINES	67939-72-4	0.00033%
NAPHTHALENE	91-20-3	0.00030%
DITHIOCARBAMATE	204079-86-7	0.00022%
CATIONIC RESIN	42751-79-1	0.00019%
PHOSPHONIC ACID, SODIUM SALT	22042-96-2	0.00019%
ACETIC ACID	64-19-7	0.00018%
1 2 4-TRIMETHYLBENZENE	95-63-6	0.00018%
XYLENE	1330-20-7	0.00016%
QUATERNARY AMMONIUM COMPOUND	68391-01-5	0.00012%
THIOGLYCOLIC ACID	68-11-1	0.00008%
BENZENESULFONIC ACID, 4-C10-13-SEC-ALKYL DERIVATIVES	85536-14-7	0.00007%
MESITYLENE	108-67-8	0.00003%
POTASSIUM HYDROXIDE	1310-58-3	0.00003%
ISOPROPANOL	67-63-0	0.00003%
DIETHYLENETRIAMINE	111-40-0	< 0.00001%

Baker Hughes Australia Pty Limited

Prepared: 3 February 2015

Chemical Disclosure

DMP approved format

ETHANEDIOL	107-21-1	< 0.00001%
AMINES, N-TALLOW ALKYLTRIMETHYLENEDI-, ETHOXYLATED	61790-85-0	< 0.00001%
SODIUM THIOSULPHATE	10102-17-7	< 0.00001%
C12-16 ALKYL BENZYL DIMETHYLAMMONIUM CHLORIDE	68424-85-1	< 0.00001%
ETHOXYLATED TALL OIL	61791-00-2	< 0.00001%
ETHANOL	64-17-5	< 0.00001%
TOTAL	-	100%

A. SYSTEM DETAILS

OPERATOR:	Buru Energy
PROJECT / WELL:	Ungani Extended Production Test
SYSTEM:	Monitor Vertical and Lateral Field Connectivity
TOTAL QUANTITY OF SYSTEM	98,000 L (single application)

B. PRODUCT LIST

Product name	Supplier	Purpose	Product in system fluid (%)	Toxicity & Ecotoxicity info	MSDS attached
Produced water	Formation Water	Base Fluid	99.9999	Full chemical disclosure incorporated above.	N/A
Tracerco 140b	Tracerco	Well Conductivity Monitoring	< 0.00001%	<u>Ecotoxicity:</u> No known significant effects or critical hazards <u>Acute Toxicity</u> Seawater Daphnia LC50 (48 hours): 298 mg/l <u>Chronic Toxicity:</u> No known significant effects or critical hazards for carcinogenicity. <u>Biodegradation/bioaccumulation:</u> Not readily biodegradable (28 days): 0%	Yes
Total			100%	N/A	

C. CHEMICAL LIST

Chemicals used for Well Conductivity Monitoring	CAS number	Mass fraction (%)
Benzoic acid, 3-fluoro, sodium salt	499-57-0	0.05092%
Produced Water	7732-18-5	99.9491%
Total		100%

Material Safety Data Sheet



CRW24006

1. Identification of the material and supplier

Names

Product name : CRW24006
Product code : CRW24006
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 : Corrosion inhibitor

2. Hazards identification

Classification : C; R34
R43
R52/53

Risk phrases : R34- Causes burns.
R43- May cause sensitisation by skin contact.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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

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

3. Composition/information on ingredients

Ingredient name	CAS number	Concentration
Amine compound		10 - 30
2-(2-butoxyethoxy)ethanol	112-34-5	10 - 30
acetic acid	64-19-7	5 - 10
Thioglycolic acid	68-11-1	1 - 5
2,2'-iminodiethylamine	111-40-0	0.1 - 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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. 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 | : Get medical attention immediately. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. |
| Skin contact | : Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. |
| Eye contact | : Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. |
| Protection of first-aiders | : No action shall be taken involving any personal risk or without suitable training. 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 | : 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. 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
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. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8). |
| Environmental precautions | : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). 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. |

6 . Accidental release measures

- 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

2-(2-butoxyethoxy)ethanol

Exposure limits

EH40/2005 WELs (United Kingdom (UK), 8/2007).

TWA: 10 ppm 8 hour(s).

STEL: 15 ppm 15 minute(s).

STEL: 15 mg/m³ 15 minute(s).

TWA: 10 mg/m³ 8 hour(s).

acetic acid

Safe Work Australia (Australia, 8/2005).

STEL: 37 mg/m³ 15 minute(s).

STEL: 15 ppm 15 minute(s).

TWA: 25 mg/m³ 8 hour(s).

TWA: 10 ppm 8 hour(s).

Thioglycolic acid

Safe Work Australia (Australia, 8/2005). Absorbed through skin.

TWA: 3.8 mg/m³ 8 hour(s).

TWA: 1 ppm 8 hour(s).

2,2'-iminodiethylamine

Safe Work Australia (Australia, 8/2005). Absorbed through skin.

TWA: 4.2 mg/m³ 8 hour(s).

TWA: 1 ppm 8 hour(s).

Recommended monitoring procedures

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

Engineering measures

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

Hygiene measures

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

Eyes

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Hands

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Respiratory

- : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Skin

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

8 . Exposure controls/personal protection

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

9 . Physical and chemical properties

Physical state : Liquid.
Colour : Amber. [Dark]
Odour : Characteristic.
Relative density : 0.99 to 1.01 (20°C)
Flash point : Closed cup: Not applicable.
pH : 4.1 to 4.9
Solubility : Soluble in water

10 . Stability and reactivity

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

11 . Toxicological information

Potential acute health effects

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Ingestion : May cause burns to mouth, throat and stomach.
Skin contact : Corrosive to the skin. Causes burns. May cause sensitisation by skin contact.
Eye contact : Corrosive to eyes. Causes burns.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-(2-butoxyethoxy)ethanol	LD50 Dermal	Rabbit	2700 mg/kg	-
	LD50 Oral	Rat	4500 mg/kg	-
acetic acid	LC50 Inhalation Gas.	Mouse	5620 ppm	1 hours
	LD50 Oral	Mouse	4960 mg/kg	-
	LD50 Oral	Rat	3310 mg/kg	-
Thioglycolic acid	LC50 Inhalation Vapour	Rat	210 mg/m3	4 hours
	LD50 Oral	Rat	114 mg/kg	-
2,2'-iminodiethylamine	LD50 Dermal	Rabbit	1090 mg/kg	-
	LD50 Oral	Rat	1080 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
2-(2-butoxyethoxy)ethanol	Eyes - Moderate irritant	Rabbit	-	-	-
	Eyes - Severe irritant	Rabbit	-	-	-
acetic acid	Eyes - Mild irritant	Rabbit	-	-	-
	Skin - Mild irritant	Human	-	-	-
	Skin - Mild irritant	Rabbit	-	-	-
	Skin - Severe irritant	Rabbit	-	-	-

11 . Toxicological information

2,2'-iminodiethylamine

Skin - Moderate
irritant

Rabbit

-

-

-

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects

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

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Inhalation : No specific data.

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

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

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

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

12 . Ecological information

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

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
2-(2-butoxyethoxy)ethanol	Acute LC50 1300000 ug/L Fresh water	Fish - Lepomis macrochirus - 33 to 75 mm	96 hours
acetic acid	Acute EC50 300.82 mg/l Marine water	Algae	72 hours
	Acute EC50 300.82 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 300.82 mg/l Marine water	Fish	96 hours
Thioglycolic acid	Acute LC50 30000 ug/L Fresh water	Fish - Pimephales promelas	96 hours
2,2'-iminodiethylamine	Acute LC50 53500 ug/L Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1014000 ug/L Fresh water	Fish - Poecilia reticulata	96 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

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

13 . Disposal considerations

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

14 . Transport information

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

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

5

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : C; R34
R43
R52/53

Risk phrases : R34- Causes burns.
R43- May cause sensitisation by skin contact.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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

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

16 . Other information

Date of printing : 21 January 2013.

Date of issue/ Date of revision : 21 January 2013

Date of previous issue : No previous validation

Version : 1

Indicates information that has changed from previously issued version.

Disclaimer

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.

Material Safety Data Sheet



TRETOLITE* DMO24900

1. Identification of the material and supplier

Names

Product name : TRETOLITE* DMO24900
Product code : DMO24900
ADG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains aromatic naphtha)
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 : Demulsifier

2. Hazards identification

Classification : Carc. Cat. 3; R40
Xn; R65
R66, R67
N; R51/53

Risk phrases : R40- Limited evidence of a carcinogenic effect.
R65- Harmful: may cause lung damage if swallowed.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapours may cause drowsiness and dizziness.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S36/37- Wear suitable protective clothing and gloves.
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
Solvent naphtha (petroleum), heavy arom.	64742-94-5	30 - 60
2-ethylhexan-1-ol	104-76-7	1 - 5
naphthalene	91-20-3	1 - 5
1,2,4-trimethylbenzene	95-63-6	1 - 5
xylene	1330-20-7	1 - 5

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

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

4 . First-aid measures

- | | |
|-----------------------------------|---|
| Inhalation | : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. 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. 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 | : Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Continue to rinse for at least 15 minutes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse. |
| Eye contact | : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention. |
| 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 | : 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 dry chemical, CO2, water spray (fog) or alcohol resistant foam |
| Not suitable | : Do not use water jet. |
| Special exposure hazards | : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. This material is 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
nitrogen 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 | : 3Z |

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. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (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. May be harmful to the environment if released in large quantities. |
| Small spill | : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container. |

6 . Accidental release measures

- 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). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the 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 a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name

2-ethylhexan-1-ol

naphthalene

1,2,4-trimethylbenzene

xylene

Exposure limits

TRGS900 AGW (Germany, 2/2010).TWA: 110 mg/m³ 8 hour(s).PEAK: 110 mg/m³ 15 minute(s).

TWA: 20 ppm 8 hour(s).

PEAK: 20 ppm 15 minute(s).

Safe Work Australia (Australia, 8/2005).STEL: 79 mg/m³, 0 times per shift, 15 minute(s).

STEL: 15 ppm, 0 times per shift, 15 minute(s).

TWA: 52 mg/m³, 0 times per shift, 8 hour(s).

TWA: 10 ppm, 0 times per shift, 8 hour(s).

Safe Work Australia (Australia, 8/2005).TWA: 123 mg/m³, 0 times per shift, 8 hour(s).

TWA: 25 ppm, 0 times per shift, 8 hour(s).

Safe Work Australia (Australia, 8/2005).STEL: 655 mg/m³, 0 times per shift, 15 minute(s).

STEL: 150 ppm, 0 times per shift, 15 minute(s).

TWA: 350 mg/m³, 0 times per shift, 8 hour(s).

TWA: 80 ppm, 0 times per shift, 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. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures

- : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. 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 . Exposure controls/personal protection

- 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.
- Odour** : Aromatic. Hydrocarbon.
- Relative density** : 0.935 to 0.955 (20°C)
- Flash point** : Closed cup: 63°C (145.4°F) [Pensky-Martens.]
- pH** : 6 to 8 [Conc. (% w/w): 5%]
- Viscosity** : Kinematic (40°C (104°F)): 0.01 to 0.1 cm²/s (1 to 10 cSt)
- Solubility** : Insoluble 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** : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Avoid release to the environment. Refer to special instructions/safety data sheet.
- Materials to avoid** : Reactive or incompatible with the following materials:
oxidizing materials
- 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** : Vapours may cause drowsiness and dizziness. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Ingestion** : Aspiration hazard if swallowed. Can enter lungs and cause damage.
- Skin contact** : Defatting to the skin. May cause skin dryness and irritation.
- Eye contact** : May cause eye irritation.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Solvent naphtha (petroleum), heavy arom.	LD50 Oral	Rat	>2000 mg/kg	-
2-ethylhexan-1-ol	LD50 Oral	Rat	3200 mg/kg	-
	LD50 Dermal	Rabbit	1970 mg/kg	-
	LD50 Dermal	Rat	>3000 mg/kg	-
	LD50 Oral	Rat	3730 mg/kg	-
1,2,4-trimethylbenzene xylene	LC50 Inhalation Vapour	Rat	18000 mg/m3	4 hours
	LD50 Dermal	Rabbit	>1700 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
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11 . Toxicological information

Solvent naphtha (petroleum), heavy arom. 2-ethylhexan-1-ol	Skin - Mild irritant	Rabbit	-	-	-
	Eyes - Moderate irritant	Rabbit	-	-	-
	Eyes - Severe irritant	Rabbit	-	-	-
	Skin - Mild irritant	Rabbit	-	-	-
	Skin - Moderate irritant	Rabbit	-	-	-
	Skin - Severe irritant	Rabbit	-	-	-
naphthalene	Skin - Mild irritant	Rabbit	-	-	-
	Skin - Severe irritant	Rabbit	-	-	-
xylene	Eyes - Mild irritant	Rabbit	-	-	-
	Eyes - Severe irritant	Rabbit	-	-	-
	Skin - Mild irritant	Rat	-	-	-
	Skin - Moderate irritant	Rabbit	-	-	-

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Product name	Carcinogenic effects	Mutagenic effects	Developmental effects	Fertility effects
naphthalene	Carc. Cat. 3; R40	-	-	-

Chronic effects : Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity : May cause cancer, based on animal data. Limited evidence of a carcinogenic effect. Risk of cancer depends on duration and level of exposure.

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:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo

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

Skin : Adverse symptoms may include the following:
irritation
dryness
cracking

Eyes : No specific data.

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

12 . Ecological information

Ecotoxicity : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Water polluting material. Do not allow any potentially contaminated water, including rain water, runoff from fire fighting or spills, to enter any waterway, sewer or drain.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Solvent naphtha (petroleum), heavy arom.	Acute LC50 1 to 10 mg/l	Fish	96 hours
2-ethylhexan-1-ol	Acute LC50 10 to 33 mg/L Fresh water	Fish - Lepomis macrochirus - 0.1 g	96 hours
naphthalene	Acute EC50 1.96 mg/L Fresh water	Daphnia - Daphnia magna - <24 hours	48 hours
	Acute LC50 315 ug/L Fresh water	Fish - Melanotaenia fluviatilis - LARVAE - 1 days	96 hours
	Chronic NOEC 600 ug/L Fresh water	Daphnia - Daphnia magna - <=24 hours	48 hours

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Solvent naphtha (petroleum), heavy arom.	-	-	Not readily
naphthalene	-	-	Not readily
1,2,4-trimethylbenzene	-	-	Not readily

Bioaccumulative potential


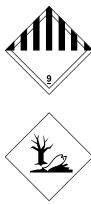
Product/ingredient name	LogP _{ow}	BCF	Potential
naphthalene	3.01	-	high
xylene	3.12 to 3.2	-	high

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	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains aromatic naphtha)	9	III		Hazchem code 3Z
ADR	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains aromatic naphtha)	9	III		UK Hazchem: 3Z

14 . Transport information

IMDG	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains aromatic naphtha)	9	III	 	-
IATA	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains aromatic naphtha)	9	III	 	-

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

5

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : Carc. Cat. 3; R40
Xn; R65
N; R51/53

Risk phrases : R40- Limited evidence of a carcinogenic effect.
R65- Harmful: may cause lung damage if swallowed.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapours may cause drowsiness and dizziness.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S36/37- Wear suitable protective clothing and gloves.
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 : 2 November 2012.

Date of issue/ Date of revision : 2 November 2012

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.

OSW24514

1 . Identification of the material and supplier

Names

Product name : OSW24514
Product code : OSW24514
ADG : NOT REGULATED
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 : Oxygen scavenger

2 . Hazards identification

Classification : Xi; R36/37
R31

Risk phrases : R36/37- Irritating to eyes and respiratory system.
R31- Contact with acids liberates toxic gas.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of soap and water.
S39- Wear eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

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

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
ammonium hydrogensulphite	10192-30-0	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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. 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.

4 . First-aid measures

- 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** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention.
- 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** : 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:
nitrogen oxides
sulfur 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. 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. Separate from acids. 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	: 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. Engineering controls may be required to control the primary or secondary risks associated with this product.
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	: Clear. / Yellow.
Odour	: sulfur oxides
Relative density	: 1.3 to 1.4 (20°C)
Flash point	: Closed cup: Not applicable.
pH	: 4.5 to 5.5
Solubility	: Easily soluble in the following materials: cold water.

10 . Stability and reactivity

Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following: contact with acids Reactions may include the following: liberation of toxic gas
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials: acids
Hazardous decomposition products	: Contact with acids liberates toxic gas.

11 . Toxicological information

Potential acute health effects

- Inhalation** : Irritating to respiratory system. 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** : Irritating 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

- : 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

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

Ingestion

- : No specific data.

Skin

- : No specific data.

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	-	-		Hazchem code 2X
ADR	Not regulated.	NOT REGULATED	-	-		UK Hazchem: 2X
IMDG	Not regulated.	NOT REGULATED BY IMO	-	-		-
IATA	Not regulated.	NOT REGULATED BY IATA	-	-		-

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs 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; R36

Risk phrases : R36/37- Irritating to eyes and respiratory system.
R31- Contact with acids liberates toxic gas.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of soap and water.
S39- Wear eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

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

16 . Other information

Date of printing : 29 January 2013.

Date of issue/ Date of revision : 29 January 2013

Date of previous issue : 10 November 2011

Version : 2

☐ 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.

1. Identification of the material and supplier

Names

Product name : TRETOLITE* RBW24136
Product code : RBW24136
ADG : Corrosive liquid, n.o.s. (potassium hydroxide)
Supplier : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

Tel: +613 9580 9004

Fax: +613 9580 6004

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

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

Uses

Material uses : Water Clarifier

2. Hazards identification

Classification : C; R34

Risk phrases : R34- Causes burns.

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

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

3. Composition/information on ingredients

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

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

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

4. First-aid measures

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

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

4 . First-aid measures

- Skin contact** : Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Eye contact** : Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Advice to doctor** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Hazchem code** : 2X

6 . Accidental release measures

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

7 . Handling and storage

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

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name

potassium hydroxide

Exposure limits

Safe Work Australia (Australia, 8/2005).PEAK: 2 mg/m³ 15 minute(s).

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

9 . Physical and chemical properties

- Physical state** : Liquid.
- Colour** : Amber. to Red.
- Odour** : Rotten eggs.
- Relative density** : 1.08 (20°C)
- pH** : 10.5 to 12
- Viscosity** : Kinematic: <0.2 cm²/s (<20 cSt)
- Solubility** : Soluble in water

10 . Stability and reactivity

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

11 . Toxicological information

Potential acute health effects

- Inhalation** : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
- Ingestion** : May cause burns to mouth, throat and stomach.
- Skin contact** : Corrosive to the skin. Causes burns.
- Eye contact** : Corrosive to eyes. Causes burns.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
potassium hydroxide	LD50 Oral	Rat	273 mg/kg	-
Conclusion/Summary	: Not available.			

Potential chronic health effects

Chronic toxicity

- Conclusion/Summary** : Not available.

Irritation/Corrosion

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

- Conclusion/Summary** : Not available.

Sensitiser

- Conclusion/Summary** : Not available.

Carcinogenicity

- Conclusion/Summary** : Not available.

Mutagenicity

- Conclusion/Summary** : Not available.

Teratogenicity

- Conclusion/Summary** : Not available.

Reproductive toxicity

- Conclusion/Summary** : Not available.

- Chronic effects** : No known significant effects or critical hazards.

- Carcinogenicity** : No known significant effects or critical hazards.

- Mutagenicity** : No known significant effects or critical hazards.

- Teratogenicity** : No known significant effects or critical hazards.

- Developmental effects** : No known significant effects or critical hazards.

- Fertility effects** : No known significant effects or critical hazards.

- Inhalation** : No specific data.

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

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

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

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

12 . Ecological information

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

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

Conclusion/Summary : Not available.

Other ecological information

Persistence/degradability





Conclusion/Summary : Not available.

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

13 . Disposal considerations

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

14 . Transport information

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

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

5

Control of Scheduled Carcinogenic Substances

Ingredient name

No listed substance

Schedule

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

EU Classification : C; R34

Risk phrases : R34- Causes burns.

Safety phrases : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.

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

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

15 . Regulatory information

16 . Other information

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

▣ Indicates information that has changed from previously issued version.

Disclaimer

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

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

SCW24457

1 . Identification of the material and supplier

Names

Product name : SCW24457
Product code : SCW24457
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 : Scale inhibitor

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

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 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. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. 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 : 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. Chemical burns must be treated promptly by a physician.

Skin contact : Get medical attention immediately. Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4 . First-aid measures

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

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through 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. Separate from alkalis. 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** : 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.

8 . Exposure controls/personal protection

- 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** : Straw.
- Odour** : Characteristic.
- Relative density** : 1.065 to 1.085 (20°C)
- Flash point** : Closed cup: Not applicable.
- pH** : 1.3 to 1.9
- Solubility** : Completely soluble in water

10 . Stability and reactivity

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

11 . Toxicological information

Potential acute health effects

- Inhalation** : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Ingestion** : May cause burns to mouth, throat and stomach.
- Skin contact** : Severely corrosive to the skin. Causes burns.
- Eye contact** : Severely corrosive to the eyes. Causes severe burns.

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.

11 . Toxicological information

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Inhalation : No specific data.

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

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

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

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.		-	-		-
ADR	Not regulated.		-	-		-
IMDG	Not regulated.		-	-		-
IATA	Not regulated.		-	-		-

PG* : Packing group

15 . Regulatory information

Standard for the Uniform Scheduling of Drugs and Poisons

Not regulated.

Sector of Use : Industrial
Professional

Control of Scheduled Carcinogenic Substances

Ingredient name

Schedule

No listed substance

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

EU Classification : 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 : 22 October 2012.

Date of issue/ Date of revision : 22 October 2012

Date of previous issue : No previous validation

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.

Material Safety Data Sheet



XC24380

1 . Identification of the material and supplier

Names

Product name : XC24380
Product code : XC24380
ADG : Toxic liquid, organic, n.o.s. (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 spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.
- Small spill** : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

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

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name

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.
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Irritation/Corrosion

Conclusion/Summary	: Not available.
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Sensitiser

Conclusion/Summary	: Not available.
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Carcinogenicity

Conclusion/Summary	: Not available.
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Mutagenicity

Conclusion/Summary	: Not available.
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Teratogenicity

Conclusion/Summary	: Not available.
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Reproductive toxicity

Conclusion/Summary	: Not available.
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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.

TRETOLITE* RBW24122

1 . Identification of the material and supplier

Names

Product name : TRETOLITE* RBW24122
Product code : RBW24122
ADG : -
Supplier : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

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

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

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

Uses

Material uses : Water clarifier.

2 . Hazards identification

Classification : Not regulated.
Risk phrases : Not classified.
Statement of hazardous/ dangerous nature : NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.
GHS Classification
Classification of the substance or mixture : Not classified.
Hazard pictograms :
Signal word : No signal word.
Hazard statements : No known significant effects or critical hazards.
Precautionary statements
General : Not applicable.
Prevention : Not applicable.
Response : Not applicable.
Storage : Not applicable.
Disposal : Not applicable.
Other hazards which do not result in classification : None known.

3 . Composition/information on ingredients

There are no 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.
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 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** : **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** : White.
- Relative density** : 1 to 1.02 (20°C)
- Flash point** : Closed cup: Not applicable.
- pH** : 2 to 4
- Viscosity** : Kinematic (room temperature): <1 cm²/s (<100 cSt)
- Solubility** : Easily soluble in the following materials: cold water.

10 . Stability and reactivity

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

11 . Toxicological information

Potential acute health effects

Inhalation	: No known significant effects or critical hazards.
Ingestion	: 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.
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Potential chronic health effects

Chronic toxicity

Conclusion/Summary	: Not available.
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Irritation/Corrosion

Conclusion/Summary	: Not available.
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Sensitiser

Conclusion/Summary	: Not available.
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Carcinogenicity

Conclusion/Summary	: Not available.
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Mutagenicity

Conclusion/Summary	: Not available.
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Teratogenicity

Conclusion/Summary	: Not available.
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Reproductive toxicity

Conclusion/Summary	: Not available.
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Chronic effects	: No known significant effects or critical hazards.
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Carcinogenicity	: No known significant effects or critical hazards.
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Mutagenicity	: No known significant effects or critical hazards.
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Teratogenicity	: No known significant effects or critical hazards.
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Developmental effects	: No known significant effects or critical hazards.
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Fertility effects	: No known significant effects or critical hazards.
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Inhalation	: No specific data.
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Ingestion	: No specific data.
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Skin	: No specific data.
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Eyes	: No specific data.
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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.	-	-	-		<u>Hazchem code</u> -
ADR	Not regulated.	-	-	-		UK Hazchem: -
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 : 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

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Date of previous issue : 21 January 2013
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.

TRETOLITE* RBW24365

1 . Identification of the material and supplier

Names

Product name : TRETOLITE* RBW24365
Product code : RBW24365
Supplier : Baker Hughes, Australia
5 Walker Street,
Braeside,
Victoria 3195,
Australia

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

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

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

Uses

Material uses : Water Clarifier

2 . Hazards identification

Classification : Xi; R36/38
Risk phrases : R36/38- Irritating to eyes and skin.
Safety phrases : S24/25- Avoid contact with skin and eyes.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37- Wear suitable gloves.
S60- This material and its container must be disposed of as hazardous waste.

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

3 . Composition/information on ingredients

Ingredient name	CAS number	Concentration
Polyaluminium Chloride		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.

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** : No specific data.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

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

7 . Handling and storage

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

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name

Polyaluminium Chloride

Exposure limits

Safe Work Australia (Australia, 8/2005). Notes: as Al
TWA: 2 mg/m³, (as Al) 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.

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** : Yellow. [Light]
- Relative density** : 1.12 to 1.14 (20°C)
- Flash point** : Closed cup: Not applicable.
- pH** : 3.6 to 4.6 [Conc. (% w/w): 1%]
- Solubility** : Soluble in water

10 . Stability and reactivity

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

11 . Toxicological information

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : 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
Polyaluminium Chloride	LD50 Oral	Rat	681 mg/kg	-

Conclusion/Summary : Not available.

Potential chronic health effects

Chronic toxicity

11 . Toxicological information

Conclusion/Summary	: Not available.
<u>Irritation/Corrosion</u>	
Conclusion/Summary	: Not available.
<u>Sensitiser</u>	
Conclusion/Summary	: Not available.
<u>Carcinogenicity</u>	
Conclusion/Summary	: Not available.
<u>Mutagenicity</u>	
Conclusion/Summary	: Not available.
<u>Teratogenicity</u>	
Conclusion/Summary	: Not available.
<u>Reproductive toxicity</u>	
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.
<u>Aquatic ecotoxicity</u>	
Conclusion/Summary	: Not available.
<u>Other ecological information</u>	
<u>Persistence/degradability</u>	
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.
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14 . Transport information

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

14 . Transport information

IATA	Not regulated.		-	-		-
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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 : Xi; R36/38

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

Safety phrases : S24/25- Avoid contact with skin and eyes.
 S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
 S37- Wear suitable gloves.
 S60- This material and its container must be disposed of as hazardous waste.

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 : 21 January 2013.

Date of issue/ Date of revision : 21 January 2013

Date of previous issue : No previous validation

Version : 1

Indicates information that has changed from previously issued version.

Disclaimer

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

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

XC24040

1 . Identification of the material and supplier

Names

Product name : XC24040
Product code : XC24040
ADG : TOXIC LIQUID, ORGANIC, N.O.S. (tetrakis(hydroxymethyl)phosphonium sulphate)

Supplier

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.
S24/25- Avoid contact with skin and eyes.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.
S38- In case of insufficient ventilation, wear suitable respiratory equipment.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S57- Use appropriate containment to avoid environmental contamination.
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	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	: 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).
- Environmental precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.
- Small spill** : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert dry material and place in an appropriate waste disposal container.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

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

8 . Exposure controls/personal protection

Occupational exposure limits

Ingredient name

tetrakis(hydroxymethyl)phosphonium sulphate(2:1)

Exposure limits

ACGIH TLV (United States, 6/2013). Skin sensitizer.
TWA: 2 mg/m³ 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** : 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.

8 . Exposure controls/personal protection

- 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.
- Relative density** : 1.12 to 1.15 (20°C)
- Flash point** : Closed cup: Not applicable.
- pH** : 2.9 to 3.5 [Conc. (% w/w): 1%]
- Solubility** : 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** : 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 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	575 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

11 . Toxicological information

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	-

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

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
	Acute LC50 119 mg/l	Fish	96 hours
	Chronic NOEC 0.032 ppm Marine water	Daphnia - Daphnia magna	21 days

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

15 . Regulatory information

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. S24/25- Avoid contact with skin and eyes. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37/39- Wear suitable gloves and eye/face protection. S38- In case of insufficient ventilation, wear suitable respiratory equipment. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S57- Use appropriate containment to avoid environmental contamination. 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	: 15 April 2014.
Date of issue/ Date of revision	: 15 April 2014
Date of previous issue	: 25 February 2013
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.

SAFETY DATA SHEET

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

Identification of the substance or mixture

Product name : TRACERCO™ 140b
Product type : Liquid.
Product use : Industrial applications.
Specific uses : Diagnostic agents.

Supplier : TRACERCO,
 Pavilion 11, Coxwold Way,
 Belasis Hall Technology Park,
 Billingham, Stockton-on-Tees,
 UNITED KINGDOM, TS23 4EA

e-mail address of person responsible for this SDS : florence.cowan@matthey.com

Emergency telephone number (with hours of operation) : TRACERCO (24 hours)
 +44 (0) 1642 375500

2. HAZARDS IDENTIFICATION

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : C; R34

Human health hazards : Causes burns.

Additional warning phrases : Warning - this preparation contains a substance not yet tested completely.
 The toxicological characteristics of this material have not been fully determined.

See section 11 for more detailed information on health effects and symptoms.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation : Mixture

Ingredient name	CAS number	%	Number	Classification
20-25				C; R34
See section 16 for the full text of the R-phrases declared above				

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.

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] PBT-substance

[4] vPvB-substance

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

4. FIRST AID MEASURES

First-aid measures

- | | |
|-----------------------------------|--|
| Inhalation | : Get medical attention immediately. Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |
| Ingestion | : Get medical attention immediately. Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. |
| Skin contact | : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur. |
| Eye contact | : Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 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. |
| Notes to physician | : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. |

See section 11 for more detailed information on health effects and symptoms.

5. FIRE-FIGHTING MEASURES

- | | |
|---|---|
| Suitable | : Use an extinguishing agent suitable for the surrounding fire. |
| Not suitable | : None known. |
| Special exposure hazards | : In a fire or if heated, a pressure increase will occur and the container may burst. 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 | : No specific data. |
| 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. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8). |
| Environmental precautions | : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). |

Methods for cleaning up

6. ACCIDENTAL RELEASE MEASURES

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

7. HANDLING AND STORAGE

- Handling** : Do not breathe vapour or mist. Do not ingest. Do not get in eyes or on skin or clothing. Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : 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. Store in accordance with local regulations.
- Packaging materials**
- Recommended** : Use original container.
- Specific uses** : Diagnostic agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values

Ingredient name

Occupational exposure limits

No exposure limit value known.

- 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. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Exposure controls

- Occupational exposure controls** : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Gloves should be changed regularly to avoid permeation problems.
- Eye protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- 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

General information

Appearance

- Physical state** : Liquid.
- Colour** : White.
- Odour** : Not available.

Important health, safety and environmental information

- pH** : 11.3
- Boiling point** : Not determined.
- Pour point** : Not determined.
- Flash point** : Not determined.
- Explosive properties** : Not available.
- Flammability (solid, gas)** : Not applicable.
- Oxidising properties** : Not available.
- Vapour pressure (mm Hg)** : Not determined.
- Relative density** : 1.112
- Solubility** : Partially soluble in the following materials: acetone, isopropanol
- Solubility - Water** : Miscible in water.
- Octanol/water partition coefficient** : Not determined.
- Viscosity (m.Pa.s)** : Not determined.
- Vapour density** : Not determined.
- Evaporation rate (butyl acetate = 1)** : Not determined.

10. STABILITY AND REACTIVITY

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

10. STABILITY AND REACTIVITY

11. TOXICOLOGICAL INFORMATION

Toxicokinetics

Absorption	: Not available.
Distribution	: Not available.
Metabolism	: Not available.
Elimination	: Not available.

Potential acute health effects

Inhalation	: May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
Ingestion	: May cause burns to mouth, throat and stomach. Ingestion may cause irritation of the gastrointestinal tract. Ingestion may cause nausea, weakness and central nervous system effects.
Skin contact	: Corrosive to the skin. Causes burns. Repeated or prolonged skin contact may cause irritation.
Eye contact	: Corrosive to eyes. Causes burns.

Acute toxicity

Conclusion/Summary	: Not available.
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Potential chronic health effects

Chronic toxicity

Conclusion/Summary	: Not available.
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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.
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Fertility effects	: No known significant effects or critical hazards.
--------------------------	---

Over-exposure signs/symptoms

Inhalation	: No specific data.
Ingestion	: Adverse symptoms may include the following: stomach pains
Skin	: Adverse symptoms may include the following: pain or irritation redness blistering may occur
Eyes	: Adverse symptoms may include the following: pain watering redness

12. ECOLOGICAL INFORMATION

Environmental effects : Not readily biodegradable.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
TRACERCO 140b	-	Acute LC50 298 mg/l Marine water	Daphnia	48 hours

Conclusion/Summary : Not available.

Other ecological information

Biodegradability

Product/ingredient name	Test	Result	Dose	Inoculum
TRACERCO 140b	OECD 306	0 % - Not readily - 28 days	-	-

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
TRACERCO 140b	-	-	Not readily

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

PBT : Not applicable.

vPvB : Not applicable.

13. DISPOSAL CONSIDERATIONS

Used material may have different hazards or properties from the new material. This safety data sheet does not apply to the used material.

In all cases where a EWC code is given, this applies to the material under normal conditions of use and may not be appropriate for used material where the properties may have changed. It is the responsibility of the user to check that any waste code recommendation is appropriate to their material in accordance with the recommendation of the European Waste Catalogue.

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

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

Container information: : Since the emptied container retains product residue, follow label warnings even after it has been emptied.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

European waste catalogue (EWC) : The user should assign a waste code to the material in accordance with the recommendations of the European Waste Catalogue.

14. TRANSPORT INFORMATION

International transport regulations

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADR/RID Class	Not regulated.	-	-	-		-
ADN/ADNR Class	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-

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14. TRANSPORT INFORMATION

IATA Class	Not regulated.	-	-	-	-
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PG* : Packing group

15. REGULATORY INFORMATION

Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

EU regulations

Classification and labeling have been determined according to EU Directives 67/548/EEC and 1999/45/EC (including amendments) and take into account the intended product use.

Hazard symbol or symbols :



Risk phrases : R34- Causes burns.
Warning - this preparation contains a substance not yet tested completely.

Safety phrases : S23- Do not breathe vapour or spray.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of water.
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).
S60- This material and its container must be disposed of as hazardous waste.

Contains :

Product use : Industrial applications.

Europe inventory : Not determined.

Black List Chemicals : Not listed

Priority List Chemicals : Not listed

Integrated pollution prevention and control list (IPPC) - Air : Not listed

Integrated pollution prevention and control list (IPPC) - Water : Not listed

Prior Informed Consent. List of chemicals subject to the international PIC procedure (Part I, II, III) :

Other EU regulations

Additional warning phrases : Warning - this preparation contains a substance not yet tested completely.

International regulations

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

16. OTHER INFORMATION

Full text of R-phrases referred to in sections 2 and 3 - United Kingdom (UK) : R34- Causes burns.

Full text of classifications referred to in sections 2 and 3 - United Kingdom (UK) : C - Corrosive

Uses

FOR INDUSTRIAL USE ONLY

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Annex