DOCUMENT NO	REVISION	DATE OF REVISION
W-DNG19-003-SUM	0	20 NOVEMBER 2014

Dongara-19

Wellbore Clean-up

WIA Environmental Summary Document

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1.0 CONTACT DETAILS

Production Engineering Manager
AWE Perth Pty Limited
Level 4, 679 Murray Street
WEST PERTH WA 6005
Phone: 08 9480 1300

2.0 PURPOSE

The purpose of this document is to provide an Environmental Summary of the Dongara-19 workover well intervention activity. Note, this document should be read in conjunction with the related Onshore North Perth Basin Well Intervention Activities Environment Plan Summary.

3.0 ACTIVITY LOCATION

The proposed wellbore cleanup activity is located at Dongara-19 well site.

The Dongara-19 wellhead is located within Permit L1 in the North Perth Basin

Surface Location (GDA94): 29° 16’ 14.54” S 115° 02’ 48.11” E

Dongara-19 wellhead is located inside a private farmland property. The well is approximately 11 km East of the township of Dongara.

Figure 1 Dongara-19 Wellsite Location

4.0 GENERAL DESCRIPTION OF EXISTING ENVIRONMENT

4.1 Natural Environment

The North Perth Basin has a Mediterranean-type climate characterised by seasonal patterns of hot, dry summers and mild, wet winters. The area is subject to high wind speeds, dust storms, lightning storms, high summer temperatures and low winter night temperatures.

Annual rainfall averages approximately 465 mm near the coast but tapers off to around 335 mm 100 km inland. Generally 55% of annual rainfall occurs between April and September with the wetter months being June and July.

The soils consist of calcareous and siliceous sand underlain by aeolianite, which is often exposed. The North Perth Basin is situated entirely within the Geraldton Sandplains Biogeographical Region. Within this region, three broad physiographical units are recognised; the Swan Coastal Plain, the Arrowsmith Region and the Dandaragan Plateau. The areas in which WIA will be undertaken will generally be located entirely within the Swan Coastal Plain unit, which forms an elongated strip approximately 40km wide running along the coast.

Groundwater and surface water drainage is westward but the Irwin River valley to the north of the region is the only major coordinated drainage indentation. A number of swamps surrounded by dense scrub, frequent limestone outcrops and the occasional laterite outcrop are the other major features in the region. The sub-surface geology of the area consists of the Late Jurassic Yarragadee Formation, which is overlain by Tertiary Sediments. Groundwater is present in the Tertiary Sediments and the Yarragadee Formation, and the groundwater level is near, or at surface in the aforementioned swamps and low lying areas, following the surface topography, but with lower relief.

The North Perth Basin is located within the Irwin Botanical District (Northern Sandplains Region), within the Southwest Botanical Province as defined by Beard (1976). Under the Interim Biogeographic Regionalisation for Australia (IBRA) (Environment Australia 2000), the area lies on the Geraldton Sandplain, which is described as ‘mainly proteaceous scrub-heaths, rich in endemics, on the sandy earths of an extensive, undulating, lateritic sandplain mantling Permian to Cretaceous strata’.

4.2 Social Environment

The surroundings are populated region with limited settlement, transport or communications infrastructure. The townships of Dongara/Port Denison, Mingenew and Eneabba are the largest population centres in the vicinity of the proposal.

The region is relatively undeveloped, comprising of small coastal settlements that are economically dependent on fishing, agriculture, tourism, mining and natural gas / oil production. Dongara/Port Denison is a rock lobster fishing port.

Land use within the surrounding region is pastoral, consisting of wheat, sheep and cattle farming. The bushland areas of the region support seasonal honey production and commercial wildflower harvesting.

5.0 SUMMARY

Dongara-19 is located in Permit L1 in the North Perth Basin. The well is approximately 11km East from the township of Dongara. The Dongara-19 well was spudded on the 7th February 1970 targeting the Dongara Sandstone Formation. The well was completed as an oil producer using sucker rod pump to lift fluids to surface.

In May 2014 the well was selected as a candidate for water disposal. The production annulus was successfully pressure tested to 350psi and the wellhead changed out from a sucker rod pumping tree to a conventional production tree setup.

Upon attempting to conduct the injectivity test the well began to pressure up. The THP reached 1500psi which was the limit of the pump and no injectivity was observed. It is suspected the perforations are blocked with scale.

To regain injectivity the outline of the wellbore clean-up program is as follows:

1. Obtain tubing, production casing, intermediate casing and surface casing pressures
2. Rig up pump and pumping lines to pump down tubing and pressure test
3. Begin pumping down tubing to establish injectivity
4. Pump Wax Dissolver down tubing and displace with inhibited water
5. Pump 15% HCl Acid down tubing and displace with inhibited water
6. Perform post acid injectivity test
7. Rig down and demobilise

The WIA program will be managed in accordance with the commitments outlined in the Onshore North Perth Basin Well Intervention Activities Environment Plan (EP) [HSE-E-075]. For the proposed Dongara-19 WIA; there are no additional risks or impacts above or beyond the accepted EP [HSE-E-75] issued December 16th 2013.

5.1 Products, additives, chemicals and other substances disclosure

The objective of this Summary Document is to disclose products, additives, chemicals and other substances required under the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012.

AWE provided Written Notification to the DMP for the inclusion of 'Idcide-20' (Biocide) within the Dongara-19 WIA, the amendment was accepted by the DMP 18 November 2014.

AWE confirms that all chemicals and substances have been accurately disclosed in Table 5 for its Dongara-19 WIA program.

The MSDS's for the proposed chemicals are located within Attachment 2.

5.2 Injecting excess water into Dongara-19 well

Dongara-19 will be used as a water disposal well for excess Well Intervention Activity (WIA) fluid, the excess water is pumped out from the source well to onsite storage tanks into a tanker. It is then transported by road to the Dongara-19 well, at which time hoses are rigged up from the tanker to the well via a pump. The fluid is then pumped into the well. The perforation depths and a salinity comparison are provided in the following tables.

Table 1 Depths of excess WIA liquid disposal well

Disposal wells	Perforations Depth (m)
Dongara-19	1773m to 1785m

The top of cement outside the production casing is 823 m, the quality of cement above perforations is good except for a poor cement patch between 1189 and 1250 m. Table 2 below shows the salinity comparison of disposal water and formation water.

Table 2 Salinity Comparison

Formation Water	Inhibited fluid for WIA
25,000 ppm	~200 ppm

AWE previously sought approval from the Department of Mines and Petroleum to convert Dongara-19 into a water disposal well, the Dongara-19 Water Disposal Well Environmental Bridging Document [W-DNG19-002 Rev 0] was accepted 16 June 2014.

5.3 Site Rehabilitation

There are no specific plans to rehabilitate the Dongara-19 well site within the next 1 – 2 years. In the future when the well is plugged and abandoned & in accordance with clause 638 of the Schedule of Onshore Petroleum Exploration and Production Requirements - 1991 the site will be rehabilitated and restored as far as practicable to its original condition. This activity will be completed within two years of the well being plugged and abandoned. In accordance with Section 4.5 of the accepted WIA EP [HSE-E-75] Rev E; a rehabilitation plan will be provided to the Department of Mines and Petroleum within 12 months after the plug and abandonment, which is prior to the actual rehabilitation activities. Remediation of the site will be in accordance with the appropriate Decommissioning Management Plan for the field or well.

Monitoring of well site rehabilitation is conducted until completion criteria are achieved. Completion Criteria differs for each Plugged and Abandoned well site. On private lease the completion criteria includes;

- No WIA equipment and waste on site,
- Gravel/marl sheeting material removed,
- Any stock piled topsoil respread;
- Stabilising agent applied to prevent erosion (as required),
- Erected fencing removed.

5.4 Site preparation and earthwork

No additional site or earth works are required at Dongara-19.

5.5 Impacts and Risks of Activity

The risks and impacts associated with by the activity are assessed within Section 6.0 of the accepted EP [HSE-E-75] Rev E.

The major risks associated with this activity are:

- Introduction of weeds (risk analysis ranked this risk as low)
- Disruption of agricultural activities (risk analysis ranked this risk as medium)
- Fuel, oil or chemical spills (risk analysis ranked this risk as low)
- Disposal of waste (risk analysis ranked this risk as low)
- Groundwater contamination (risk analysis ranked this risk as low)

6.0 IMPLEMENTATION STRATEGY

The implementation strategy outlined in the accepted EP [HSE-E-75] Rev E Section 8.0 is applicable to the proposed activity. The aspects include:

- Systems, practices and procedures

- Roles and responsibilities of personnel
- Training and competencies
- Monitoring, auditing, management of non-conformance and review
- Emergency response (including oil spill contingency plan)
- Record keeping
- Reporting

The WIA program will be managed in accordance with the commitments outlined in the AWE Onshore North Perth Basin Well Intervention Activities Environment Plan (EP) [HSE-E-75] Rev E. For the purposed WIA; there are no additional risks or impacts above or beyond the accepted EP [HSE-E-75] Rev E approved December 16th 2013.

The objective of this Environmental Summary Document is to disclose products, additives, chemicals and other substances (Table 5 A-C) required under the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012.

7.0 CONSULTATION

AWE has consulted the relevant stakeholders throughout the project planning phase and commits to ongoing consultation during the proposed Dongara-19 activities. AWE will notify the landowner in regards to timing of proposed activities and be available throughout the course of activities to field any inquiries or respond to any issues should they arise.

8.0 REPORTING

The incident and routine reporting requirements as required under the applicable legislation is summarised within Table 3, AWE will adhere to these reporting requirements as they apply to WIA. The following table is based on the Auditing and Reporting Requirements for Petroleum Activities in Western Australia (October 2012) document compiled by the Department of Mines and Petroleum.

Table 3 Summary of reporting requirements

Legislation	Regulation and Schedules	Incident Reporting	Routine Reporting
Petroleum and Geothermal Energy Resources Act 1967	Petroleum and Geothermal Energy Resources (Environment) Regulations 2012	<u>Regulation 28 and 29</u> Reportable incident reporting: Reportable incidents are required to be reported to DMP within 2 hours and a written report within 3 days. <u>Regulation 30</u> Recordable incident reporting: A record of all recordable incidents that	<u>Regulation 16</u> Requires the operator to report to DMP at least annually to provide evidence of compliance. A close out report is acceptable on completion of an activity if the activity is of short duration. <u>Regulation 34</u> The operator of an activity must monitor all emissions and discharges

Legislation	Regulation and Schedules	Incident Reporting	Routine Reporting
		occurred during the calendar month to be submitted to DMP not later than 15 days after the end of that calendar month.	to any land, air, marine, seabed, groundwater, sub-surface or inland waters environment and submit a written report of emissions and discharges every three months commencing when the EP for the activity is approved.
	Schedule of Onshore Petroleum and Production Requirements – 1991 (amended 2010)	Clause 290 (1)(a) and (1)(b) Report shall be made forthwith (2 hours) upon the occurrence of: • Spill of hydrocarbon in inland waters > 80L; • Spill in hydrocarbon in other areas > 500L; • Significant quantity of petroleum in gaseous form > 500m3; and • Uncontrolled escape or ignition of petroleum or other flammable or combustible material causing a potentially hazardous situation.	
	Schedule of Geothermal Exploration and Production Requirements – 2009	Clause 289 (1)(a) A report shall forthwith (2 hours) be made to an Inspector upon the occurrence of a significant spillage of geofluids which is in excess of 500 litres.	
	Direction issued 22 April 03	Spillage of hydrocarbons or other material* that affects a ground surface area > 100m2. * Other materials include drilling fluids, chemicals, produced formation water or a substance that has	

Legislation	Regulation and Schedules	Incident Reporting	Routine Reporting
		the potential to adversely affect surface vegetation, soil or subsurface ground water.	

9.0 CHEMICAL DISCLOSURE

Table 5 Products, additives, chemicals and other substances

Table 5.A System Details

Operator	AWE Perth Pty Ltd
Project/Well	Dongara-19
System	Workover Fluids
Total Volume of System	93,576L

* includes 100 % Contingency volume

Table 5.B Product List

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	MSDS Attached
Water	Town or Bore water	Base fluid	N/A- Natural product.	90.935%	Yes
Bactron IK-57	Champion Technologies	Biocide	Acute/Chronic toxicity *Glutaraldehyde as an ingredient:* 50%: The product contains a substance which is very toxic to aquatic organisms. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms. LC50: 10-100 mg/litres/96 hours (fish) Biodegradation/Bioaccumulation: Biodegradable, Soluble in water. Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise. The products of degradation are less toxic than the product itself. Water: 50% Natural product	0.068%	Yes
Cortron IRU-145	Champion Technologies	Corrosion Inhibitor	Acute/Chronic toxicity *Ammonium Bisulphite as an ingredient:* 70%: LC50: > 100 mg/litres/96 hours (fish) Biodegradation/Bioaccumulation: The product is soluble in water. The product does not contain any substances expected to be bioaccumulating. The product is easily biodegradable. Water: 30% Natural product	0.009%	Yes
HCL 15%	Telford	Acid to remove scale	Acute/Chronic toxicity *HCL as an ingredient*: 15% LD50 (Oral): >900mg/Kg (rat) LC50 (Inhalation): 300 ppm/hr (rat) Biodegradation/Bioaccumulation: When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater. Water: 85% Natural product.	8.549%	Yes
PAO24273	Baker Hughes	Wax Modifying Agent	Acute Toxicity d-Limonene as an ingredient 100%: Flowthrough Acute Fresh Water: LC50: 0.72mg/litres/96hrs (Fathead minnow) Static Acute Fresh Water: EC50: 0.85mg/litres/24hrs (Daphnia magna) Biodegradation/bioaccumulation: OECD 301D Biodegradability, 7 days 41%	0.438%	Yes
Idcide 20	Rheochem/ Newpark Drilling Fluids	Biocide	Acute Toxicity: 25% Tetrakis (hydroxymethyl) Phosphonium Sulphate (55566-30-8): LC50 (Rainbow Trout) = 119 mg/L/96 hr LC50(Bluegill Sunfish) = 93 mg/L/ 96 hr EC50 (Daphnia Magna) = 19 mg/L/48 hr LC50 (Brown Shrimp) = 340 mg/L/96 hr	0.072%	Yes

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	MSDS Attached
			LC50 (Mysid Shrimp) = 9.5 mg/L/96 hr LC50 (Sheepshead Minnow) = 94 mg/L/96 hr LC50 (Jevenile Plaice) = 86 mg/L/96 hr Waste Water management EC50 (Activated Sludge) = 24mg/L/3 hr. Water: 25% Natural product. Biodegradation/bioaccumulation: Ultimate aerobic biodegradability: 70% biodegradation after 21 days		

Table 5.C Chemical List

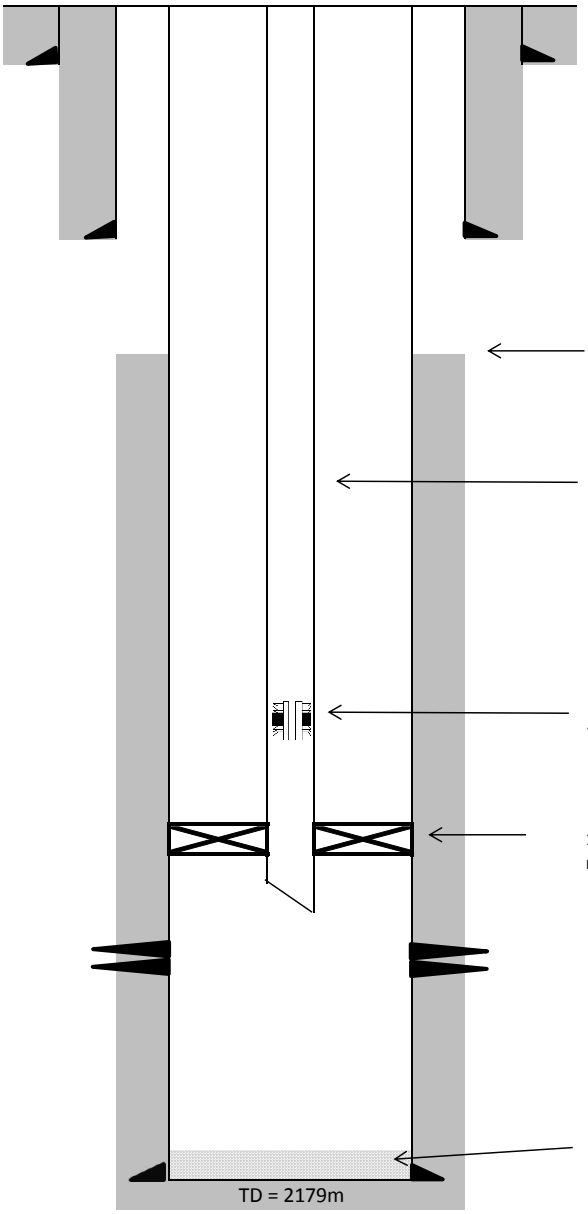
Chemicals Name	CAS number	Mass fraction (%)
Water	7732-18-5	98.239%
Ammonium Bisulphite	10192-30-0	0.006%
Glutaraldehyde	111-30-8	0.034%
Hydrochloric acid*	7647-01-0	1.282%
d-Limonene	227-813-5	0.438%
Tetrakis (hydroxymethyl) Phosphonium Sulphate	55566-30-8	0.018%
		Total:100.017%

ATTACHMENTS

Attachment 1
Well Construction Diagram (Not to scale)

Dongara-19 - Current
All depths in mMDRT

Yarragadee	**surface**
Cadda Formation	**1175 m**
Cattamarra Coal Measures	**1286 m**
Kockatea Shale	**1661 m**
Dongara Sandstone	**1773 m**
Wagina Sandstone	**1800 m**
Carynginia	**1829 m**
Irwin River Coal Measures	**1911 m**



Conductor Casing Shoe set at 98m
340mm, 71.43kg/m, H-40
13 3/8 " 48#, H-40

Surface casing shoes set at 363m
244mm, 59.52kg/m, J-55

TOC 823m

Production tubing
73mm, 9.67kg/m,
2-7/8" 6.5#
End of tubing at 1771.90 m

Insert pump anchor
Top located at 1572m

140mm (5.5") Production Packer at 1765.60 m

Perforations
1773-1779m
1779-1785m

Plug Back Depth at 1910.2m

Production casing shoe set at 1924m
140mm, 25.29kg/m, J-55
5.5", 17#, J-55

Attachment 2
MSDSs General Well Control

Baker Petrolite

SAFETY DATA SHEET

PAO24273

1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME PAO24273

PRODUCT NO. PAO24273

APPLICATION Wax modifying solvent.

SUPPLIER

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

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

2 HAZARDS IDENTIFICATION

HAZARD ID

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

STATEMENT OF HAZARDOUS NATURE

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

SAFETY PHRASES

Avoid contact with skin. Wear suitable gloves. Use only in well-ventilated areas. Use appropriate containment to avoid environmental contamination. Avoid release to the environment. Refer to special instructions/safety data sheets.

DG CLASS

Class 3: Flammable liquids.

PACKING GROUP III

UN NO. 2319

HAZCHEM CODE 3[Y]

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
d-LIMONENE	227-813-5	5989-27-5	60-100%	R10 R43 Xi;R38 N;R50/53

4 FIRST-AID MEASURES

INHALATION

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

INGESTION

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

SKIN CONTACT

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

EYE CONTACT

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

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Flammable liquid. Extinguish with foam, carbon dioxide or dry powder.

SPECIAL FIRE FIGHTING PROCEDURES

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

UNUSUAL FIRE & EXPLOSION HAZARDS

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

PROTECTIVE MEASURES IN FIRE

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

HAZCHEM CODE 3[Y]

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear suitable protective clothing, gloves and safety goggles. Put on appropriate personal protective equipment. Keep personnel removed and upwind of spill. Shut off all ignition sources; no flares, smoking, or flames in hazard area. Approach release from upwind. Shut off leak if it can be done safely. Contain spilled material. Keep out of waterways. Dike large spills and use a non-sparking or explosion proof means to transfer material to an appropriate container for disposal. For small spills add absorbent (soil may be used in the absence of other suitable materials). Scoop up material and place in a sealed, liquid-proof container. Note that flammable vapours may form an ignitable mixture with air. Vapours may travel considerable distances from spill and flash back, if ignited. Waste must be disposed of in accodance with federal, state and local environmental control regulations.

ENVIRONMENTAL PRECAUTIONS

Dike to prevent entering any sewer or waterway.

SPILL CLEAN UP METHODS

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

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

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

STORAGE PRECAUTIONS

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

STORAGE CLASS

Flammable liquid storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT COMMENTS

No exposure limits noted for ingredient(s).

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

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

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

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

HAND PROTECTION

Use protective gloves made of: Neoprene. Nitrile.

EYE PROTECTION

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

OTHER PROTECTION

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENE MEASURES

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

PERSONAL PROTECTION

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

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid
COLOUR	Pale Yellow.
ODOUR	Strong. Citrus.
SOLUBILITY	Insoluble in water
BOILING POINT (°C)	175.5°C @ 760 mm Hg
MELTING POINT (°C)	-75°C
RELATIVE DENSITY	Typically 0.84 @ 20°C
VAPOUR DENSITY (air=1)	4.7
EVAPORATION RATE	5.8 (EtEt=1)
FLASH POINT (°C)	48°C CC (Closed cup).
AUTO IGNITION TEMPERATURE (°C)	237°C
FLAMMABILITY LIMIT - LOWER(%)	0.7%
FLAMMABILITY LIMIT - UPPER(%)	6.1%
SOLUBILITY VALUE (g/100g H2O@20°C)	13.8 mg/L @ 25°C

10 STABILITY AND REACTIVITY

STABILITY

No particular stability concerns.

CONDITIONS TO AVOID

Avoid contact with strong oxidisers.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong oxidising substances. Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

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

11 TOXICOLOGICAL INFORMATION

INHALATION

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

INGESTION

May be harmful if swallowed. Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract. May irritate and cause stomach pain, vomiting and diarrhoea. May cause nausea, headache, dizziness and intoxication. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.

SKIN CONTACT

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

EYE CONTACT

Contact with eyes may cause moderate to severe irritation.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Please contact Baker Petrolite for further information.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

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

14 TRANSPORT INFORMATION

PROPER SHIPPING NAME	TERPENE HYDROCARBONS, N.O.S. (contains d-Limonene)
UN NO.	2319
DG CLASS	Class 3: Flammable liquids.
PACKING GROUP	III
HAZCHEM CODE	3[Y]
UN NO. SEA	2319
IMDG CLASS	3
IMDG PACK GR.	III
UN NO. AIR	2319
AIR CLASS	3
AIR PACK GR.	III
HAZCHEM CODE	3[Y]

15 REGULATORY INFORMATION

LABELLING

Irritant

Dangerous for the environment

CONTAINS d-LIMONENE

RISK PHRASES

R10	Flammable.
R38	Irritating to skin.
R43	May cause sensitisation by skin contact.

R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY PHRASES

S24	Avoid contact with skin.
S37	Wear suitable gloves.
S51	Use only in well-ventilated areas.
S57	Use appropriate containment to avoid environmental contamination.
S61	Avoid release to the environment. Refer to special instructions/safety data sheets.

POISONS SCHEDULE NUMBER Not scheduled

NATIONAL REGULATIONS AND REFERENCES

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

16 OTHER INFORMATION

GENERAL INFORMATION

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

REVISION COMMENTS

Revision has taken place in all sections.

REVISION DATE 23/10/2007

REV. NO./REPL. SDS GENERATED 2

RISK PHRASES IN FULL

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

EcoTox™ Report

April 22, 2013

PAO24273

Aquatic Toxicity

Flowthrough Acute Freshwater

Specie:	Fathead minnow (*Pimephales promelas*)
Method:	OECD 203
Test Procedure:	Definitive
Duration:	96-Hour
Temperature:	25 C
Sample Prep:	Water Soluble Stock
Renewal:	Flow-through
Comments:	

Results	Values
Lethal Concentration 50%, 96 hrs	0.72 mg/l
No Observable Effect Concentration, 96 hrs	0.25 mg/l

Static Acute Freshwater

Specie:	*Daphnia magna*
Method:	OECD 202
Test Procedure:	Definitive
Duration:	48-Hour
Temperature:	20 C
Sample Prep:	Water Soluble Stock
Renewal:	None
Comments:	

Results	Values
Effective Concentration 50%, 24 hrs	0.85 mg/l
Effective Concentration 50%, 48 hrs	0.36 mg/l
No Observable Effect Concentration, 24 hrs	0.35 mg/l
No Observable Effect Concentration, 48 hrs	0.07 mg/l

EcoTox™ Report

BAKER HUGHES

April 22, 2013

PAO24273

Chemical Fate

Octanol/Water Partition Coefficient (Log Pow)

Method:	HPLC (OECD 117)
Detector:	
Log Pow Calc. Weighted Avg. (all peaks):	
Calc. Weighted Avg. (excl. peaks <5%):	
Log Octanol/Water Partition Coeff. Range:	
Comments:	Under the test conditions, the partition coefficient, log Kow, of (+)-limonene was determined to be 4.38 (S.E. = 0.05) at 37 °C. The calculated log Kow values of (+)-limonene were 4.36 (fragment method), 4.83 (atom /fragment contribution method) and 2.94 (atomistic method).

Environmental Fate

Method:	OECD 301D		
Biodegradability Type:	Ready	COD Value:	
Media:	Freshwater	ThOD Num:	3.3
Test Concentration:	2 mg/l	Reference:	Sodium Acetate
Duration:	28 days	Ref. Conc.:	2 mg/l
Comments:	Product evaluated was a follows: 48.4% of dl-limonene; Beta phellandrene 20.6%; alpha terpinene 9.8%; gamma terpinene 5.8%; terpinolene 4.5%		

Results	Values	Reference
Biodegradability, 7 days	41%	76%
Biodegradability, 14 days	71%	83%
Biodegradability, 21 days	76%	
Biodegradability, 28 days	83%	

MATERIAL SAFETY DATA SHEET
Cortron IRU-145

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

PRODUCT NO. IRU145 (AU)

APPLICATION Corrosion inhibitor.

SUPPLIER
Champion Technologies
Unit 1
5 Brodie-Hall Drive
Bentley WA 6102
Tel No :(08) 9472 9400
Fax No :(08) 9472 9422
AFTER HOURS :(08) 9483 6402

EMERGENCY TELEPHONE DIAL 000 Police or Fire Brigade

2 HAZARDS IDENTIFICATION

RISK PHRASES

R31	Contact with acids liberates toxic gas.
R36	Irritating to eyes.

STATEMENT OF HAZARDOUS NATURE

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

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content %	Classification (67/548)
AMMONIUM BISULPHITE	233-469-7	10192-30-0	60-90%	Xi;R36. R31.

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

4 FIRST-AID MEASURES

INHALATION

Remove victim immediately from source of exposure. Rinse nose and mouth with water. Keep the affected person warm and at rest. Get prompt medical attention.

INGESTION

NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Rinse mouth thoroughly. Promptly get affected person to drink large volumes of water to dilute the swallowed chemical. DO NOT INDUCE VOMITING! Get medical attention immediately! Generates toxic gas in contact with acid.

SKIN CONTACT

Rinse the skin immediately with lots of water. Remove contaminated clothes and rinse skin thoroughly with water. Get medical attention if irritation persists after washing.

EYE CONTACT

Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention immediately. Continue to rinse. To hospital or eye specialist.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Water spray. Carbon dioxide (CO2). Dry chemicals, sand, dolomite etc.

SPECIAL FIRE FIGHTING PROCEDURES

Avoid breathing fire vapours. Keep up-wind to avoid fumes. Avoid water in straight hose stream; will scatter and spread fire. Keep run-off water out of sewers and water sources. Dike for water control.

UNUSUAL FIRE & EXPLOSION HAZARDS

Burning produces irritant fumes

SPECIFIC HAZARDS

Fire or high temperatures create: Oxides of: Nitrogen. Sulphur. Ammonia or amines.

PROTECTIVE MEASURES IN FIRE

Wear full protective clothing. Use air-supplied respirator during fire fighting. Cool containers with water spray if safe to do so.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear protective clothing as described in Section 8 of this safety data sheet. In case of inadequate ventilation, use respiratory protection. Avoid inhalation of vapours and contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS

Do not discharge into drains, water courses or onto the ground.

SPILL CLEAN UP METHODS

Absorb in vermiculite, dry sand or earth and place into containers. Stop leak if possible without risk. Containers with collected spillage must be properly labelled with correct contents and hazard symbol. Do not let washing down water contaminate ponds or waterways.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

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

STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place. Store at temperatures between 10 - 30°C. Plastic lined steel drum. Store away from: Acids. Alkalis. Avoid contact with oxidising agents. Keep away from food, drink and animal feeding stuffs.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

Use engineering controls to reduce air contamination to permissible exposure level. Provide eyewash station.

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Respiratory protection must be used if air contamination exceeds acceptable level. Wear mask supplied with: Gas cartridge (sulphur dioxide).

HAND PROTECTION

Use protective gloves made of: Rubber, neoprene or PVC. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

EYE PROTECTION

Use approved safety goggles or face shield.

OTHER PROTECTION

Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact.

HYGIENE MEASURES

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke. Use appropriate skin cream to prevent drying of skin. Wash promptly with soap & water if skin becomes contaminated.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Clear liquid.
COLOUR	Colourless to pale yellow.
ODOUR	Pungent.
SOLUBILITY	Miscible with water
BOILING POINT (°C)	~105
RELATIVE DENSITY	1.30 - 1.40 @ 25°C
pH-VALUE, CONC. SOLUTION	4.5 - 5.5
VISCOSITY	~10 cps @ 25 °c

10 STABILITY AND REACTIVITY

STABILITY

Stable under normal temperature conditions and recommended use.

CONDITIONS TO AVOID

Avoid heat, flames and other sources of ignition.

HAZARDOUS POLYMERISATION

Will not polymerise.

MATERIALS TO AVOID

Strong acids. Strong oxidising substances. Strong alkalis. Copper, zinc and their alloys

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of: Nitrogen. Sulphur. Ammonia or amines.

11 TOXICOLOGICAL INFORMATION

INHALATION

May cause mild irritation to the respiratory system

INGESTION

May cause discomfort if swallowed.

SKIN CONTACT

May cause mild irritation with repeated or prolonged skin contact.

EYE CONTACT

Irritating to eyes.

12 ECOLOGICAL INFORMATION

MOBILITY

The product is soluble in water.

BIOACCUMULATION

The product does not contain any substances expected to be bioaccumulating.

DEGRADABILITY

The product is easily biodegradable.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

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

14 TRANSPORT INFORMATION

GENERAL

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

15 REGULATORY INFORMATION

LABELLING

Irritant

RISK PHRASES

R31	Contact with acids liberates toxic gas.
R36	Irritating to eyes.

SAFETY PHRASES

S25	Avoid contact with eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S60	This material and its container must be disposed of as hazardous waste.

Cortron IRU-145

NATIONAL REGULATIONS AND REFERENCES

Approved Criteria for Classifying Hazardous Substances. National Code of Practice for the Preparation of Material Safety Data Sheets.

16 OTHER INFORMATION

REVISION COMMENTS

Revision to Section 14 (Transport)

ISSUED BY

LL

REVISION DATE	05/12/2012
REV. NO./REPL. SDS GENERATED	2

RISK PHRASES IN FULL

R31	Contact with acids liberates toxic gas.
R36	Irritating to eyes.

MATERIAL SAFETY DATA SHEET
Bactron IK-57

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

PRODUCT NO. IK57 (AU)

APPLICATION BIOCIDE

SUPPLIER
Champion Technologies
Unit 1
5 Brodie-Hall Drive
Bentley WA 6102
Tel No :(08) 9472 9400
Fax No :(08) 9472 9422
AFTER HOURS :(08) 9483 6402

EMERGENCY TELEPHONE DIAL 000 Police or Fire Brigade

PROPER SHIPPING NAME CORROSIVE LIQUID, TOXIC, N.O.S. (Contains Glutaraldehyde)

2 HAZARDS IDENTIFICATION

RISK PHRASES

R23/25	Toxic by inhalation and if swallowed.
R34	Causes burns.
R37	Irritating to respiratory system.
R42/43	May cause sensitisation by inhalation and skin contact.
R50	Very toxic to aquatic organisms.

STATEMENT OF HAZARDOUS NATURE

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

DG CLASS

Class 8: Corrosive substances.

PACKING GROUP III

UN NO. 2922

HAZCHEM CODE 2X

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content %	Classification (67/548)
GLUTARAL	203-856-5	111-30-8	30-60%	T;R23/25 C;R34 R42/43 N;R50

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

4 FIRST-AID MEASURES

INHALATION

Move injured person into fresh air immediately. Call an ambulance. Be aware that symptoms of lung oedema (shortness of breath) may develop up to 24 hours after exposure. Bring these instructions. Rinse nose and mouth with water. If respiratory problems, artificial respiration/oxygen. Keep the affected person warm and at rest. Get prompt medical attention.

INGESTION

NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Rinse mouth thoroughly. Promptly get affected person to drink large volumes of water to dilute the swallowed chemical. DO NOT induce vomiting. Get medical attention immediately.

SKIN CONTACT

Remove affected person from source of contamination. Promptly wash contaminated skin with soap or mild detergent and water. Promptly remove clothing if soaked through and wash as above. Get medical attention immediately.

EYE CONTACT

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Immediately transport to hospital or eye specialist.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Use: Water spray, fog or mist. Foam. Carbon dioxide (CO2). Dry chemicals, sand, dolomite etc.

SPECIAL FIRE FIGHTING PROCEDURES

Use special protective clothing. Regular protection may not be safe. Keep up-wind to avoid fumes. Keep run-off water out of sewers and water sources. Dike for water control. Cool containers exposed to flames with water until well after the fire is out. Avoid water in straight hose stream; will scatter and spread fire.

UNUSUAL FIRE & EXPLOSION HAZARDS

May develop highly toxic or corrosive fumes if heated.

SPECIFIC HAZARDS

Oxides of: Carbon.

PROTECTIVE MEASURES IN FIRE

Wear self contained breathing apparatus Wear personal protective equipment.

HAZCHEM CODE 2X

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear personal protective equipment.

ENVIRONMENTAL PRECAUTIONS

Do not let product enter drains or water courses. Do not flush undiluted product into surface water or sanitary sewer systems.

SPILL CLEAN UP METHODS

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate. Stop leak if possible without risk. DO NOT touch spilled material! Clean-up personnel should use respiratory and/or liquid contact protection. Absorb with inert, damp, non-combustible material, then flush area with water. Shovel into dry containers. Cover and move the containers. Flush the area with water. Containers with collected spillage must be properly labelled with correct contents and hazard symbol. Do not let washing down water contaminate ponds or waterways.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Avoid spilling, skin and eye contact. Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Avoid acids, moisture, and combustible materials. Wear full protective clothing for prolonged exposure and/or high concentrations.

STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place. Store away from: Acids. Oxidising material. Use container made of: Suitable plastic material.

STORAGE CLASS

Chemical storage. Corrosive storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
GLUTARAL	NOHSC			0,1 ppm	0,41 mg/m3	Peak limitation, Sen

NOHSC = The National Occupational Health and Safety Commission.
Sen = Sensitiser.

PROTECTIVE EQUIPMENT

PROCESS CONDITIONS

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

ENGINEERING MEASURES

Provide adequate general and local exhaust ventilation.

RESPIRATORY EQUIPMENT

Respiratory protection must be used if air contamination exceeds acceptable level. Use chemical cartridge protection with appropriate cartridge. Chemical respirator with organic vapour cartridge.

HAND PROTECTION

Use protective gloves made of: Rubber, neoprene or PVC. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

EYE PROTECTION

Use approved safety goggles or face shield.

OTHER PROTECTION

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENE MEASURES

Wash hands at the end of each work shift and before eating, smoking and using the toilet. DO NOT SMOKE IN WORK AREA! When using do not eat, drink or smoke.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid
COLOUR	Colourless to pale yellow.
SOLUBILITY	Soluble in water.
BOILING POINT (°C)	> 100
MELTING POINT (°C)	~ -20
RELATIVE DENSITY	1.05 - 1.15 @ 25°C
VAPOUR DENSITY (air=1)	>1
VAPOUR PRESSURE	0.4 mbar @ 40°C
pH-VALUE, CONC. SOLUTION	3.1 - 4.5
VISCOSITY	4 - 8 cps
FLASH POINT (°C)	> 100 CC (Closed cup).

10 STABILITY AND REACTIVITY

STABILITY

Stable under normal temperature conditions.

CONDITIONS TO AVOID

Avoid excessive heat for prolonged periods of time.

HAZARDOUS POLYMERISATION

May polymerise.

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of: Carbon.

11 TOXICOLOGICAL INFORMATION

INHALATION

Toxic by inhalation. May cause sensitisation by inhalation. May cause respiratory allergy. Vapour may affect central nervous system and cause headache, discomfort, vomiting or intoxication. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.

INGESTION

Causes burns. May cause chemical burns in mouth, oesophagus and stomach. Toxic if swallowed.

SKIN CONTACT

Causes burns. Contact with concentrated chemical may cause severe skin damage. May cause sensitisation by skin contact.

EYE CONTACT

Causes burns.

ROUTE OF ENTRY

Inhalation. Skin absorption. Ingestion. Skin and/or eye contact.

TARGET ORGANS

Eyes Respiratory system, lungs Skin

MEDICAL SYMPTOMS

Extreme irritation of eyes and mucous membranes, including burning and tearing. Upper respiratory irritation. Severe skin irritation.

MEDICAL CONSIDERATIONS

Splash in eye requires examination by eye specialist.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

The product contains a substance which is very toxic to aquatic organisms. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

MOBILITY

Soluble in water.

DEGRADABILITY

Biodegradable

13 DISPOSAL CONSIDERATIONS

GENERAL INFORMATION

Empty containers should be taken for local recycling, recovery or waste disposal

DISPOSAL METHODS

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

14 TRANSPORT INFORMATION

PROPER SHIPPING NAME	CORROSIVE LIQUID, TOXIC, N.O.S. (Contains Glutaraldehyde)
UN NO.	2922
ADG CLASS NO.	8 (6.1)
DG CLASS	Class 8: Corrosive substances.
PACKING GROUP	III
HAZCHEM CODE	2X
UN NO. SEA	2922
IMDG CLASS	8 (6.1)
IMDG PACK GR.	III
EMS	F-A, S-B
UN NO. AIR	2922
ICAO CLASS	8
AIR SUB CLASS	6.1
AIR PACK GR.	III

15 REGULATORY INFORMATION

LABELLING

Toxic

Corrosive

Dangerous for the environment

CONTAINS GLUTARAL

RISK PHRASES

R23/25	Toxic by inhalation and if swallowed.
R34	Causes burns.
R37	Irritating to respiratory system.
R42/43	May cause sensitisation by inhalation and skin contact.
R50	Very toxic to aquatic organisms.

SAFETY PHRASES

S23	Do not breathe vapour/spray.
S25	Avoid contact with eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S38	In case of insufficient ventilation, wear suitable respiratory equipment.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
S57	Use appropriate containment to avoid environmental contamination.
S60	This material and its container must be disposed of as hazardous waste.
S61	Avoid release to the environment. Refer to special instructions/safety data sheets.

NATIONAL REGULATIONS AND REFERENCES

Approved Criteria for Classifying Hazardous Substances. National Code of Practice for the Preparation of Material Safety Data Sheets.

16 OTHER INFORMATION

REVISION COMMENTS

General revision.

ISSUED BY

LL

REVISION DATE	11/06/2012
REV. NO./REPL. SDS GENERATED	2

RISK PHRASES IN FULL

R34	Causes burns.
R37	Irritating to respiratory system.
R42/43	May cause sensitisation by inhalation and skin contact.
R23/25	Toxic by inhalation and if swallowed.
R50	Very toxic to aquatic organisms.

RHEOCHEM
A Newpark Company

SAFETY DATA SHEET

Product Name **IDCIDE-20**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name	**RHEOCHEM LTD**
Address	11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone	+61 8 9410 8200
Fax	+61 8 9410 8299
Emergency	1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site	http://www.rheochem.com.au/
Synonym(s)	IDCIDE 20
Use(s)	BIOCIDE · DRILLING FLUID ADDITIVE · WATER TREATMENT
SDS Date	11 October 2012

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R36/38	Irritating to eyes and skin.
R43	May cause sensitisation by skin contact.

SAFETY PHRASES

S23	Do not breathe gas/fumes/vapour/spray (where applicable).
S24/25	Avoid contact with skin and eyes.
S36	Wear suitable protective clothing.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number	None Allocated	**DG Class**	None Allocated
Packing Group	None Allocated	**Subsidiary Risk(s)**	None Allocated
Hazchem Code	None Allocated		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE	CAS: 55566-30-8 EC: 259-709-0	Not Available	18 - 25%
WATER	CAS: 7732-18-5 EC: 231-791-2	Not Available	Remainder

4. FIRST AID MEASURES

Eye	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor	Treat symptomatically.
First Aid Facilities	Eye wash facilities should be available.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases if strongly heated. May evolve carbon oxides, sulphur oxides and phosphates when heated to decomposition.
Fire and Explosion	Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Use an extinguishing agent suitable for the surrounding fire.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Ventilate area where possible. Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.

7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards	No exposure standard(s) allocated.
Biological Limits	No biological limit allocated.
Engineering Controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Type A (Organic vapour) respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS TO PALE YELLOW LIQUID
Odour	SLIGHT ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	> 100°C
Melting point	< 0°C
Evaporation rate	AS FOR WATER
pH	3.0 to 3.5

Vapour density	NOT AVAILABLE
Specific gravity	1.08
Solubility (water)	SOLUBLE
Vapour pressure	18 mm Hg @ 20°C
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
% Volatiles	> 60 % (Water)

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites) and acids (eg. nitric acid).
Hazardous Decomposition Products	May evolve carbon oxides, sulphur oxides and phosphates when heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Low to moderate toxicity - irritant. This product has the potential to cause adverse health effects with over exposure. Upon dilution, the potential for adverse health effects may be reduced.
Eye	Severe irritant. Contact may result in irritation, lacrimation, pain, redness and blurring or dimness of vision. Prolonged contact may result in corneal burns and possible permanent damage.
Inhalation	Low irritant. Over exposure to vapours may result in irritation of the nose and throat, with coughing. High level exposure may result in dizziness, nausea and headache. Due to the low vapour pressure, an inhalation hazard is not anticipated with normal use.
Skin	Irritant. Contact may result in irritation, redness, rash and dermatitis. Prolonged or repeated contact may result in burns. May be absorbed through skin with harmful effects. May cause sensitisation by skin contact.
Ingestion	Low to moderate toxicity. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea.
Toxicity Data	TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE (55566-30-8) LD50 (ingestion) 248 mg/kg (rat) TDLo (ingestion) 650 mg/kg/13 weeks - intermittent (rat)

12. ECOLOGICAL INFORMATION

Environment	Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.
Ecotoxicity	75% TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE (55566-30-8): LC50 (Rainbow Trout) = 119 mg/L/96 hr LC50(Bluegill Sunfish) = 93 mg/L/ 96 hr EC50 (Daphnia Magna) = 19 mg/L/48 hr LC50 (Brown Shrimp) = 340 mg/L/96 hr LC50 (Mysid Shrimp) = 9.5 mg/L/96 hr LC50 (Sheepshead Minnow) = 94 mg/L/96 hr LC50 (Jevenile Plaice) = 86 mg/L/96 hr Waste Water management EC50 (Activated Sludge) = 24 mg/L/3 hr
Persistence/Degradability	This product is readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Waste Disposal	For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved landfill site. For larger amounts, contact the manufacturer for additional information. Prevent contamination of drains or waterways as aquatic life may be threatened and environmental damage may result.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	None Allocated	None Allocated	None Allocated
Proper Shipping Name	None Allocated	None Allocated	None Allocated
DG Class/ Division	None Allocated	None Allocated	None Allocated
Subsidiary Risk(s)	None Allocated	None Allocated	None Allocated
Packing Group	None Allocated	None Allocated	None Allocated
Hazchem Code	None Allocated		

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)

Inventory Listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional Information

EXPOSURE CONTROL: If utilised in a closed system the potential for over exposure is reduced. If not used in a closed system, local exhaust ventilation is recommended to control exposure. Provide eye wash and safety shower in close proximity to points of potential exposure. Where the potential for an inhalation risk exists, an approved respirator may be required. Do not eat, store, consume food, tobacco or drink in areas where product is used.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this ChemAlert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m^3	Milligrams per Cubic Metre
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
TLV	Threshold Limit Value
TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision History

Revision	Description
1.3	Standard SDS Review
1.2	Standard SDS Review
1.1	Standard SDS Review
1.0	Initial SDS creation

Report Status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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End of SDS

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TELFORD INDUSTRIES

Chemicals & Equipment
Industrial
Swimming Pool
Mining
Water Treatment

Cromag Pty Ltd ABN 13 008 935 760
ACN 008 935 760 trading as Telford Industries

MATERIAL SAFETY DATA SHEET

HAZARDOUS SUBSTANCE ACCORDING TO WORKSAFE AUSTRALIA

1. IDENTIFICATION

Product Name: **Telchem Hydrochloric Acid 15%** (+/- 1%)

Other Names: Muriatic Acid, Spirits of Salts, HCl

Recommended Uses: Acidising of petroleum wells, boiler scale removal, chemical intermediate, ore reduction, food processing, pickling and metal cleaning, alcohol denaturant, pH adjusting of swimming pool water.

Supplier Name: Telford Industries
Street Address: 7 Valentine Street, Kewdale WA 6105
Telephone: 1800 835 115
Facsimile: 1800 835 222

Emergency Telephone Number: 0409 313 441

2. HAZARDS IDENTIFICATION

This material is hazardous according to health criteria of NOHSC Australia.

Hazard Category:
C Corrosive
T Toxic

Risk Phrase(s):
R23 Toxic by inhalation.
R35 Causes severe burns.

Safety Phrase(s):
S1/2 Keep locked up and out of the reach of children.
S9 Keep container in a well ventilated place.
S26 In case of contact with eyes, rinse immediately with plenty of water & seek medical advice.
S36/37/39 Wear suitable protective clothing, gloves & eye/face protection.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

3. COMPOSITION / INGREDIENTS INFORMATION

CHEMICAL NAME	CAS NUMBER	PROPORTION
Hydrochloric Acid	7647-01-0	15% (+/- 1%)
Water	7732-18-5	balance
		100%

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone 131 126)

Inhalation: Remove from exposure, keep warm and rest. If not breathing, give artificial respiration. If breathing is difficult, administer oxygen. Seek immediate medical attention.

Skin Contact: Avoid contact with this chemical. Remove affected clothing including footwear and wash affected area thoroughly copious quantities of water immediately. If irritation occurs, seek medical advice.

Eye Contact: Flush eyes with water immediately for at least 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of all eye and lid tissue. Seek immediate medical attention.

Ingestion: Wash out mouth with water and give large quantities of water to drink. DO NOT induce vomiting. Transport to hospital immediately.

Notes to physician: Treat symptomatically. Inhalation of high concentration of vapour may cause pulmonary oedema.

5. FIRE-FIGHTING MEASURES

Specific Hazards: Non-combustible material. If involved in fire, this product will release large quantities of hydrogen chloride gas which is very corrosive.

Fire-fighting further advice: Non-combustible liquid. However, will support combustion of other products. Incompatible with oxidizing agents, alkalis, metals, organic halogen compounds, nitro and chloro organic compounds and sources of ignition. Corrosive to steel, aluminium, tin, zinc and most metals generating flammable/explosive hydrogen gas. Will emit toxic fumes in a fire including hydrogen chloride. Fire fighters to wear self-contained breathing apparatus and full protective clothing. If available, spray water on containers to keep cool.

Suitable extinguishing media: Not combustible, however if material is involved in a fire use water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 2R

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal: Hydrochloric Acid is completely soluble in water.

Small Spills: Dilute with a lot of water and wash away. Work from up-wind.
Large Spills: Only persons wearing full protective gear, including forced air breathing equipment, should attempt to deal with either a major leak or a major spill. Contain spill, if at all possible, using solid absorbents such as soil, clay or others eg vermiculite. Make every effort to prevent a major discharge of the product into waterways or sewers. Note: a vapour cloud of acid fumes can be (partially) knocked down with water spray or fog. Larger spills or acid soils can be treated (neutralised) with lime or soda ash.
WARNING: concentrated acid can react violently with these materials, thus neutralising agents

must be added cautiously. Some dilution with water will help, provided the additional volume of liquid can be contained. Once neutralised the liquid or solid absorbent is highly concentrated in chloride salts. Disposal should be decided together with local authorities.

Dangerous Goods - Initial Emergency Response Guide No: 40

7. HANDLING AND STORAGE

Handling: Avoid skin and eye contact and inhalation of vapour. Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling.

Storage: Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials including oxidizing agents, acids, alkalis, metals, organic halogen compounds, nitro and chloro organic compounds and sources of ignition. Use corrosion resistant structural materials and lighting and ventilation systems in the storage area. Protect from direct sunlight, moisture and static discharges.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National Exposure Standards: The following exposure standard has been established for this product by The Australian Safety and Compensation Council (ASCC) formerly known as NOHSC; Hydrochloric Acid cas no: 7647-01-0 TWA = 5ppm 7.5mg/m3 Peak limitation

Biological Limit Values: No information available on biological limits for this product.

Engineering Controls: A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.

Personal Protective Equipment: RESPIRATOR: Wear an approved respirator where dusts/vapours are generated and engineering controls are inadequate (EN149). EYES: Chemical eye goggles and face shield (EN166). HANDS: Protective PVC gloves (EN374). CLOTHING: Corrosion-resistant coveralls and safety footwear (EN465).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odour: Colourless to slightly yellow corrosive liquid with pungent acidic odour.
pH: <1
Vapour Pressure: Not available
Vapour Density: 1.3 (air = 1)
Boiling Point/Range ^{o}C: 109^{o}C
Melting Point/Range ^{o}C: <-20^{o}C
Solubility in Water: 100% soluble in water.
Specific Gravity: 1.07-1.08 at 20^{o}C
Flash Point (^{o}C): Not flammable.
Flammability Limits (%): Not flammable.
Ignition Temperature (^{o}C): Not available
Molecular Formula: HCl
Additional Information:
(Typical values only – consult specification sheet)

10. STABILITY AND REACTIVITY

Chemical Stability: Product is stable under normal conditions of use, storage and temperature.

Conditions to Avoid: Avoid excessive heat, direct sunlight, moisture, static discharges, freezing and high temperatures.

Incompatible Materials: Incompatible with oxidizing agents, acids, alkalis, metals, organic halogen compounds, nitro and chloro organic compounds and sources of ignition.

Hazardous Decomposition Products: Will emit toxic fumes in a fire including hydrogen chloride. Contact with oxidizing agents liberates toxic chlorine gas. Corrosive to metals generating flammable/explosive hydrogen gas.

Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Effects

Inhalation: Toxic by inhalation! Effects of inhaling vapour and mists have not been clearly established. Most references indicate that irritation of the nose, throat and lungs would occur due to the corrosive nature of the product.

Skin Contact: Extremely corrosive! Capable of causing severe skin burns with deep ulceration. Can penetrate to deeper layers of skin. Corrosion will continue until removed. Severity depends on concentration and duration of exposure. Repeated/prolonged contact with dilute solutions may lead to irritant contact dermatitis.

Eye Contact: Extremely corrosive! Can penetrate deeply causing irritation or severe burns depending on the concentration and duration of exposure. In severe cases, ulceration and permanent damage may occur.

Ingestion: Corrosive! Causes burning of the mouth, throat and oesophagus, vomiting, diarrhoea, collapse and possible death may result.

Long Term Effects: No data available.

Acute Toxicity / Chronic Toxicity: Oral LD50 Rat: >900mg/Kg Inhale LC50 Rat: 300ppm/1hr

12. ECOLOGICAL INFORMATION

Ecotoxicity: No information available.

Persistence & Degradability: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Refer to State/Territory Land Waste Management Authority.

14. TRANSPORT INFORMATION

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG code) for transport by road and rail.

UN No: 1789

Dangerous goods Class:	8
Packing Group:	II
Hazchem Code:	2R
Proper Shipping Name:	HYDROCHLORIC ACID

15. REGULATORY INFORMATION

Poisons Schedule (Aust): S6

16. OTHER INFORMATION

Telford Industries reserves the right to change the chemical specifications without notice.

Material Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This MSDS summarises Telford Industries best knowledge of the health and safety hazard information of the selected substance and how to safely handle the selected substance in the workplace however Telford Industries expressly disclaims that the MSDS is a representation or guarantee of the chemical specifications for the substance.
Each user should read the MSDS and consider the information in the context of how the selected substance will be handled and used in the workplace including its use in conjunction with other substances.

END OF MSDS

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