ATTACHMENT II
Description/Specifications/Work Statement
PEST AND MOSQUITO CONTRL PROGRAM

A. STATEMENT OF WORK

(1) General. The United States Peace Corps Timor-Leste requires a contractor to provide a Pest and Mosquito Control Program. The Contractor shall furnish all tools, special equipment, chemicals, managerial, administrative, transportation and direct labor personnel to accomplish all work as required in the contract.

(2) **Definitions.**
"Contracting Officer" means a person appointed with the authority to enter in and administer contracts on behalf on the Government.

"Contracting Officer's Point of Contact (POC)" means an individual designated in writing by the Contracting Officer to perform specific contract administration functions.

"Government" means the Government of the United States of America.

"EPA" means the U.S. Environmental Protection Agency.

"MSDS" means Material Safety Data Sheet that lists hazardous ingredients in a chemical product, such as pesticide, and provides guidance on safety precautions.

(3) **Working Hours.**
All work shall be performed according to the agreed schedule by both the vendor and Peace Corps Timor-Leste.

If the Contractor desires to work outside of the regular hours, the Contractors shall submit a request to the Contracting Officer's Representative three (3) days prior to the start of the work. Notice must be given there (3) days in advance to enable the POC to make necessary arrangements for access clearance. Changes in works hours will not be a cause for a price increase.

B. SPECIFICATIONS/WORK DESCRIPTION

(1) The Contractor shall carry-out mosquito fogging outside the house as per the schedule agreed by both the Contractor and the Government.
- **Product to be used is: Aqua-K-Othrine Insecticide Space Spray Concentrate (see attached MSDS)**

Important: Vendor shall not use another pesticide product other than the specified. If deemed necessary, vendor shall contact the CO in writing and request for approval prior to application.

(2) The Contractor shall carry-out misting outside the house, along the outside wall and hedges and per the schedule agreed by both the Contractor and the Government.

- **Product to be used is: Demand Insecticide (see attached MSDS)**

Important: Vendor shall not use another pesticide product other than the specified. If deemed necessary, vendor shall contact the CO in writing and request for approval prior to application.

(3) The Contractor shall use larvacides for areas where there's pooling of water or whenever necessary.

- **Product to be used shall have: Larvicide 10% containing Bacillus thuringiensis Berliner var inraelenis (bti).**

Important: Vendor shall not use another pesticide product other than the specified. If deemed necessary, vendor shall contact the CO in writing and request for approval prior to application.

(4) Mosquito fogging and misting administered by a certified applicator. The Contractor shall ensure that proper techniques and procedures are followed and precautions and taken to prevent injury to and person and damage to property.

(5) The Contactor shall visually inspect that all the exterior doors and windows of the house are closed. If they are not, the Contractor shall inform the occupant or the POC to close them prior to any fogging or misting.

(6) The Contractor shall not spray on children's toys and any personal accessories such as helmets, shoes, sandals, bicycles, and the like. Inform the occupant or the POC to remove them prior to any fogging or misting. The Contractor shall not spray directly on any outside appliances (e.g., water heater, washing machine) which could be damaged by such application.

(7) The Contractor shall submit timely monthly progress report to the POC for all locations. The report shall include level of mosquito activity and any mechanical/non-chemical recommendation to control the mosquitoes.

Important: Invoices will not be processed without these reports

(8) The Contractor shall assume full responsibility and liability for any injury to any person or damage to Government property caused by mishandling or negligence of the Contractor. The Contractor shall hold the U.S. Government and its representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health and other regulations on the part of the Contractor, their employees or subcontractors.

(9) The Contractor shall coordinate any and all chemical use and activities with the POC for approval before actual application.

(10) The Contractor shall develop and implement a Pest Control Plan:

Prior to initiation of service, the Contractor shall submit to the POC a Pest Control Plan for each property or site identified in the purchase order within three (3) working days following the initial inspection. Upon receipt of the Pest Control Plan, the COR will render a decision regarding its acceptability within three (3) working days. The Contractor shall be on site to initiate service within three (3) working days following notice of approval. If aspects of the Pest Control Plan are incomplete or disapproved, the Contractor shall have three (3) working days to submit revisions.

The Pest Control Plan shall consist of the following parts:

1. Proposed methods for control, including name of any pesticide(s) to be used, specimen labels and Material Safety Data Sheets (MSDS sheets) for all pesticides proposed to be used. All professional-use pesticides must be authorized by the Department (see Exhibit 2 for pre-authorized pesticides) and appropriate for the target pest and situation. A list of brand names of rodent bait boxes and any other control devices or equipment should also be included.
2. Methods to be used to ensure the safety of building occupants and visitors to the site including the anticipated period that the premises must be vacated (if applicable).
3. Preparations that must be carried out other than by the contractor prior to implementation of the Pest Control Plan (e.g. removing pets, covering food handling equipment).
4. A description of conditions conducive to the pest problem and any structural or operational changes that would facilitate the pest control effort.
5. A copy of any local license, if applicable, for every Contractor's representative who will be performing on-site service under this contract.
6. A list identifying the on-site person(s) who will be performing the pest control work. All pertinent information regarding their qualifications, experience, and training must also be provided.

It shall be the Contractor's responsibility to carry out work according to the approved Pest Control Plan for each property or site. The Contractor shall receive the concurrence of the POC prior to implementing any subsequent changes to the approved Pest Control Plan, including additions or replacements to the pesticide list and to on-site service personnel.

C. CLEAN-UP OF AREA

The Contractor shall remove all tools, equipment and supplies from the work area. The Contractor shall not leave behind chemicals and empty chemical containers or equipment used for chemical application in the work area. The work area shall be free of dirt and/or debris when the project is complete. The Contractor shall patch and cover all holes made or drilled by the Contractor with standard construction materials. The Contractor shall comply with the Government's cleaning and safety regulations—these are the same regulations employed by the US Embassy. The Contractor shall not:

- Burn waste materials.
- Bury debris or excess materials.
- Allow volatile, harmful or dangerous materials to enter the drainage system.

D. SAFETY PRECAUTIONS

The Contractor shall observe all safety precautions throughout the performance of this contract.

END OF SOW

Aqua-K-Othrine®

Leading water-based space-spray technology for the control of mosquitoes and flies

FFAST™

Bayer Environmental Science

Aqua-K-Othrine® - the logical choice for space-spray application

- Contains synthetic pyrethroid (2% deltamethrin) in a unique EW formulation
- Primarily based on water with built-in FFAST anti-evaporant technology
- Low environmental impact and high level of safety in use
- Highly effective against flying insects such as mosquitoes and flies
- Very low rates of application
- Biodegradeable – no environmental accumulation
- Dilutes with water
- Non-flammable
- Fully WHOPES evaluated and recommended for use as a space spray (For specific details refer: http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_WHOPES_2006.2_eng.pdf)

The importance of space-spray application:

There are a number of methods available to control insects of public health importance and each has its own part to play in an integrated management program. Space-spraying is particularly effective against flying insects (mainly mosquitoes and flies) and is usually the method of choice when a mosquito-borne disease threat is imminent and rapid reduction in insect numbers is required. It can also be a method which is relied upon when resources are limited and other methods are either not practical or have not achieved adequate results.

Space-spraying is routinely carried out in many areas of the world as a crucial means to reduce the incidence of vector borne diseases such as dengue and as an important element in fly management programs.

How does space-spraying work?

Space-spraying relies on the production of a very large number of small insecticidal droplets which are intended to be suspended in the air for a period of time. When these droplets impact on the target insect they deliver a lethal dose of insecticide. There is no residual activity to be expected.

The traditional methods for space-spraying include thermal fogging; whereby a dense cloud of oil-based insecticide droplets is produced (giving the appearance of a thick fog) and Ultra Low Volume (ULV), whereby droplets are produced by a cold mechanical aerosol-generating machine.

Although in essence a very simple technique, space-spraying is built upon some elegant scientific principles. These principles need to be understood in order to maximise the effectiveness of any given product:

- Target insects are usually flying through the spray cloud (or sometimes impacted whilst resting on exposed surfaces). The efficiency of contact between the spray droplets and target insects is therefore crucial.
- This is achieved by ensuring that spray droplets remain airborne for the optimum period of time and that they contain the right dose of insecticide. These two issues are largely addressed through optimising droplet size.
- If droplets are too big they drop to the ground too quickly and don't penetrate vegetation or other obstacles encountered during application (limiting the effective area of application). If one of these big droplets impacts an individual insect then it is also 'overkill' since a high dose will be delivered per individual insect.
- If droplets are too small then they may either not deposit on a target insect (no impaction) due to aerodynamics or they can be carried upwards into the atmosphere by convection currents.
- The optimum size of droplets for space-spray application are droplets with a Volume Median Diameter (VMD) of 10 – 25 microns.

The influence of droplet size can be illustrated in the table below:

Droplet size	10 microns	20 microns	100 microns	200 microns
Time to fall 5 m in still air	34.7 minutes	8.7 minutes	20.8 seconds	5.2 seconds
Number of droplets obtained from 1 mL of diluted spray	1910 million	239 million	1.91 million	0.24 million

Bayer has a long history of industry-leading expertise in space-spraying and is able to offer products such as Aqua-K-Othrine with unique FFAST technology which help to achieve optimum droplet size during application.

The Aqua-K-Othrine advantage - FFAST

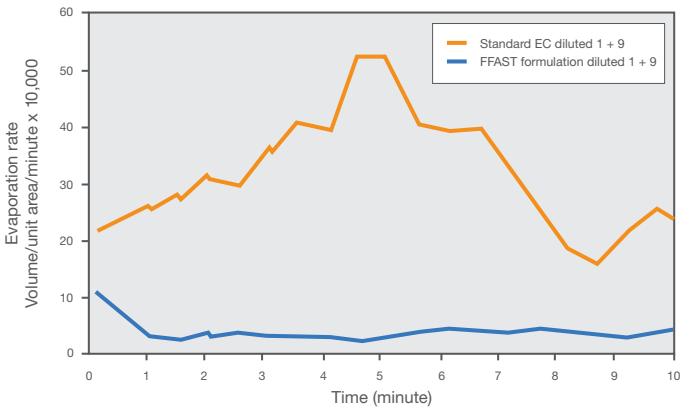
Aqua-K-Othrine represents the latest development in formulation technology for space-spray use in Australia. It is intended for dilution in water but is novel in that it is also primarily water-based, with a greatly reduced hydrocarbon solvent content. Since many solvents are potential environmental pollutants themselves, this provides an improved environmental profile. The table below illustrates the solvent contents of some commonly available space-spray products.

Product	Hydrocarbon solvent content
Other typical competitor (EC) formulations	689 g/L to 760 g/L
Reslin®	370 g/L
Aqua-K-Othrine	250 g/L

Aqua-K-Othrine is an emulsion in water (EW) formulation which in addition contains an anti-evaporant to protect the water-based spray droplets from evaporative water loss. This anti-evaporant technology is referred to as FFAST (or Film Forming Aqueous Spray Technology).

As the spray droplets are formed, the anti-evaporant agent comes out of the solution and forms a protective skin around the droplets. This process (which is completed in less than a second) ensures that the droplets maintain their size and therefore impaction efficiency for much longer than water-diluted emulsifiable concentrates (or even standard EW formulations). They are comparable in efficacy to the oil-based and oil-diluted products, but with the added benefit of economy in use, which result from the use of water as a diluent and reduced environmental contamination compared to an oil-based spray.

Evaporation rate FFAST formulation compared with standard water diluted EC



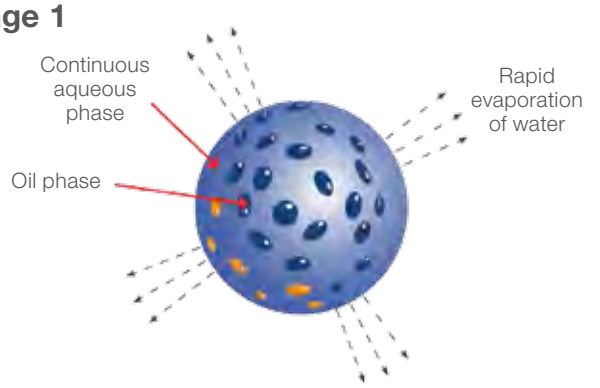
Many hydrocarbon solvents are now regarded as potential or probable carcinogens so any reduction of their use in public areas is also a desirable goal.

A comparison between different types of products is illustrated in the table below:

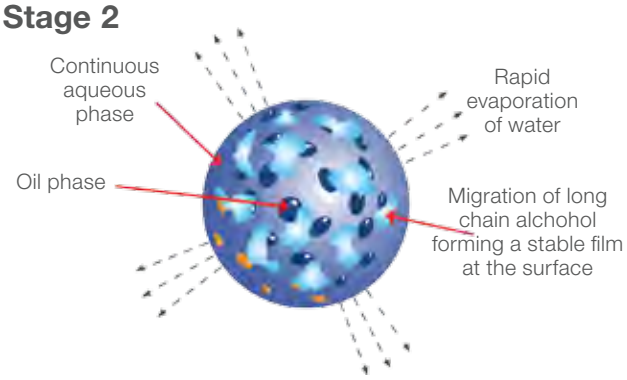
Product type	Formulation solvent content	Reliance on hydrocarbon solvents	Evaporation rate from spray droplets	Flammability (of formulation)	Environmental profile
Oil-based and oil-diluted	High	Highest	Slow	High	Worst
Oil-based and water-diluted	High	Medium	High	High	Middle
Aqua-K-Othrine with FFAST	Low	Lowest	Slow	Low	Best

The stages in formation of a FFAST droplet are illustrated in the diagrams below.

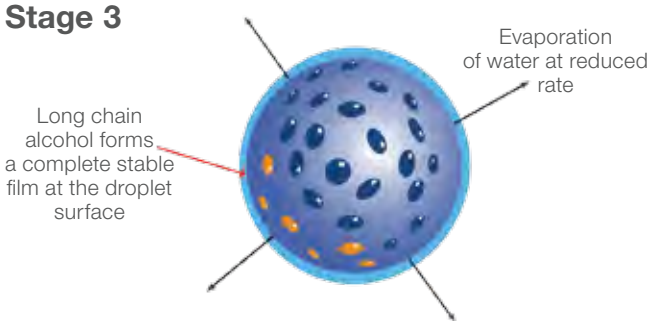
Stage 1

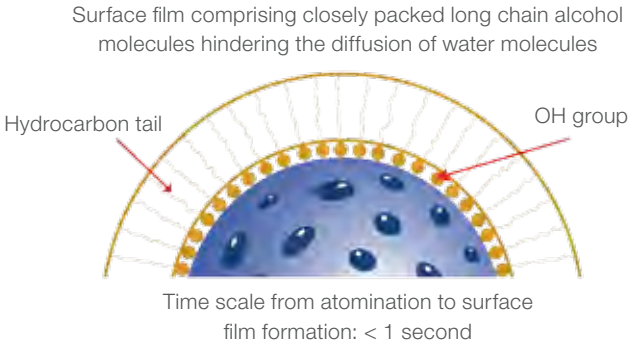


Stage 2



Stage 3





Equipment Flexibility

Aqua-K-Othrine can be applied by means of appropriate specialist equipment capable of producing and distributing droplets of a volume mean diameter (VMD) value below 50 µm (optimum droplet size 10 - 25 µm). This equipment may be thermal fogging equipment, cold aerosol generating ULV equipment and hand-held or knapsack sprayers which are designed for space-spraying.

Motorised knapsack/backpack sprayers or mist blowers produce a mist with a droplet size spectrum of 0 to 200 µm with Volume Median Diameters greater than 50 µm. These larger droplets are less efficient for flying insect control.

It has primarily been designed for ULV application, it is also ideal for use through thermal foggers. Worldwide use has demonstrated a high level of efficacy through both types of application.

Note that generally speaking, due to the lower viscosity of water-based and water-diluted formulations, smaller nozzle sizes should be adopted, otherwise droplet sizes may be too large and this can lead to precipitation (or 'spitting') from the application equipment.

Summary of label directions

The directions for use and associated general instructions which appear on the label are included below:

Situation	Pest	Rate	Critical comments
Outdoor and indoor situations where flies and/or mosquitoes are a problem (including but not limited to abattoirs, refuse tips, picnic areas, sports grounds, recreation areas, factories, industrial buildings, domestic residences and areas associated with animal production).	Adult flies and mosquitoes	Outdoors 50 mL/ha Indoors 2.5 mL/1000 m^3	Dilute with a suitable volume of water (further details provided in the next table) and apply using equipment capable of generating a mist or thermal or cold fog. Avoid application outdoors if wind speed is in excess of 10 km/h as spray will be dispersed too quickly.

Application method	Situation	Dilution rate	Application rate of dilution
ULV (Cold fogging)	Indoors	1 – 2 mL + 50 mL water	50 mL/1000 m^3
	Outdoors	50 mL + 450 mL water	500 mL/ha
Thermal Fogging	Indoors	1 – 2 mL/500 mL water	100 – 200 mL/house or 500 mL/1000 m^3
	Outdoors	50 mL + 4950 mL water	5 L / Ha

Biological activity

Aqua-K-Othrine is currently registered and in use in more than 25 countries around the world. It has been fully assessed under the World Health Organisation Pesticides Evaluation Scheme (WHOPES) and is recommended for use as a mosquito space spray. (The WHOPES evaluation process assesses human health and environmental risk as well as biological efficacy).

A summary of results from a trial carried out in 2005 (Penang, Malaysia) after outdoor ULV application is provided in the table below. The product was applied at label rate (dilution of 1:9 in water). Caged adult mosquitoes of three species were assessed for knockdown and mortality at distances of 50 m and 100 m from point of application.

Mosquito species	Check point distance	Knock-down % at time intervals (minutes) post-application					Mortality (24 hours)
		10	20	30	40	50	
Aedes aegypti	50 m	3.3	45	96.7	96.7	96.7	96.7
	100 m	13.3	35	61.7	76.7	83.3	85
Aedes albopictus	50 m	1.7	25	86.7	88.3	93.3	96.7
	100 m	16.7	35	41.7	66.7	76.7	71.7
Culex quinquefasciatus	50 m	6.7	41.7	98.3	98.3	100	86.7
	100 m	8.3	23.3	46.7	73.3	75	65

NOTE: Knockdown/mortality for the control of mosquitoes was less than 10%.

Results from a similar trial against *Aedes aegypti* only in the Philippines (Bayer Internal report) are provided below. This illustrates knockdown and adult mortality as assessed at various distances and time points after application.

Check point distance	Knock-down % at time intervals (minutes) post-application					Mortality (24 hours)
	10	20	30	40	60	
10 m	100	100	100	100	100	100
25 m	100	100	100	100	100	100
50 m	98.3	100	98.3	100	100	100
75 m	100	100	100	100	100	100
100 m	96.6	100	100	100	100	100

Product Safety

With extremely low rates of use (the lowest application rate of any other space-spray in Australia), Aqua-K-Othrine has a very high level of safety. The active ingredient, deltamethrin, has a very good safety profile which is reinforced by the range of use patterns which it is approved for globally. In the field of mosquito management it is also used for impregnation of mosquito bednets and indoor residual spraying. For fly control it is approved for use as a topical treatment to livestock. The technical knowledge which Bayer has on deltamethrin is second to none and the full WHOPES evaluation and recommendation for use of Aqua-K-Othrine is an additional re-assurance of the level of safety associated with the product.

Environmental Profile

The application of Aqua-K-Othrine according to the registered label results in no long term environmental contamination. Generally speaking, space-spray applications result in minimal deposition on surfaces; the same applies for Aqua-K-Othrine. Add to this the very low application rate and this results in no potential for bioaccumulation. The active ingredient in any spray droplets which do impact onto a surface is rapidly degraded at the very low rates applied.

Environmental Risk Assessments are extremely favourable when used according to the registered label.

Insecticide Resistance Management

The use of space sprays can be generally regarded as having little contribution to the generation of insecticide resistance development. Usually space-spray adulticides are only applied in situations where there is an immediate disease threat.
As such, an insect population is only exposed to the selection pressure over a very short space of time. Since there are no residual deposits, the selection pressure does not remain after application has ended. It would also be highly unusual for a space-spray to result in exposure to an entire population of mosquitoes or flies and as such there are always susceptible individuals that help to ensure dilution of the gene pool.

The dose of insecticide received by a target insect within a properly applied space-spray is also reasonably fixed, with very little potential for sub-lethal doses which might otherwise help to select out resistant genes. (This is in contrast to residual surface treatments over wide areas which provide an ongoing selection mechanism over a range of different dose exposures).

Summary

Aqua-K-Othrine is a unique formulation which, through the benefit of FFAST, can result in optimum droplet sizes being maintained for longer periods of time in all climatic conditions and is as effective as oil/diesel diluted space-spray concentrates. Aqua-K-Othrine is an easy-to-use, user-friendly concentrate producing a space-spray that minimises flammability, smell, staining, paintwork damage, toxicological risk and pollution.

Bayer Environmental Science is committed to sustainable development

Aqua-K-Othrine presents an opportunity to reduce the reliance on hydrocarbon solvents (traditionally a significant proportion of formulations and diluents) and thus the potential for environmental contamination. Aqua-K-Othrine has one of the lowest application rates of any mosquito adulticide currently available and this enables more compact packaging to be utilised which reduces packaging waste. This information sheet is printed on 100% recycled paper using a waterless printing process.

PROTECTING TOMORROW ...TODAY

Aqua-K-Othrine® - the logical choice for space-spray application

Bayer Environmental Science

ALWAYS READ AND FOLLOW THE REGISTERED PRODUCT LABEL PRIOR TO USE.

Aqua-K-Othrine® and Reslin® are Registered Trademarks of Bayer.

For more information on Aqua-K-Othrine contact Bayer Environmental Science
Ph: 03 9248 6888
Technical enquiries: 1800 804 479
www. bayeres.com.au

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Bayer Environmental Science
Material Safety Data Sheet
Aqua-K-Othrine® Insecticide Space-Spray Concentrate

Version / AUS
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SECTION 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product name:	**Aqua-K-Othrine® Insecticide Space-Spray Concentrate**
Other names:	None
Product code (UVP):	06477399
Recommended use:	Insecticide
Chemical formulation:	Emulsion, oil in water (EW)
Company:	Bayer Environmental Science A Business Operation of Bayer CropScience Pty Ltd ABN 87 000 226 022 391-393 Tooronga Road, East Hawthorn Victoria 3123, Australia
Telephone:	(03) 9248 6888
Technical Information Service:	1800 804 479
Facsimile:	(03) 9248 6800
Website:	www.bayeres.com.au
Contact:	(03) 9248 6888 Technical Manager
Emergency telephone no.:	1800 033 111 Orica SH&E Shared Services

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

HAZARDOUS SUBSTANCE DANGEROUS GOODS

Hazardous classification:	Hazardous (National Occupational Health and Safety Commission - NOHSC).
R-phrase(s):	R22 - Harmful if swallowed. R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R65 - Harmful: may cause lung damage if swallowed. R66 - Repeated exposure may cause skin dryness or cracking.
S-phrase(s):	See sections 4, 5, 6, 7, 8, 10, 12, 13.
ADG Classification:	Not a "Dangerous goods" for transport by road or rail according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. For transport by sea, Aqua K-Othrine Insecticide Space Spray Concentrate is a MARINE POLLUTANT. See Section 14.
SUSMP classification (Poison Schedule):	Schedule 6 (Standard for the Uniform Scheduling of Medicines and Poisons).

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Deltamethrin 20 g/L

Chemical Name	CAS-No.	Concentration [%]
Deltamethrin	52918-63-5	2.00

Solvent Naphtha (petroleum), heavy aromatic	64742-94-5	> 2.50 - < 25.00
Stearyl alcohol, ethoxylated	9005-00-9	> 1.00 - < 5.00
Other ingredients (non-hazardous) to 100 %		

SECTION 4. FIRST AID MEASURES

If poisoning occurs, immediately contact a doctor or Poisons Information Centre (telephone 13 11 26), and follow the advice given. Show this Material Safety Data Sheet to the doctor.

Inhalation

Move the victim to fresh air and keep at rest. Call a physician or poison control center immediately.

Skin contact

In case of skin contact, immediately wash with plenty of soap and water for at least 15 minutes. Warm water may increase the subjective severity of the irritation/paresthesia. This is not a sign of systemic poisoning. In case of skin irritation, application of oils or lotions containing vitamin E may be considered. If symptoms persist, call a physician.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Warm water may increase the subjective severity of the irritation/paresthesia. This is not a sign of systemic poisoning. Apply soothing eye drops, if needed anaesthetic eye drops. Get medical attention if irritation develops and persists.

Ingestion

Keep at rest. Rinse mouth. Do NOT induce vomiting. Risk of product entering the lungs on vomiting after ingestion. Call a physician or poison control center immediately.

Notes to physician

Symptoms

Local: Skin and eye paraesthesia which may be severe, usually transient with resolution within 24 hours. Skin, eye and mucous membrane irritation, cough, sneezing.
Systemic: Discomfort in the chest, tachycardia, hypotension, nausea, abdominal pain, diarrhoea, vomiting, dizziness, blurred vision, headache, anorexia, somnolence, coma, convulsions, tremors, prostration, airway hyperreaction, pulmonary oedema, palpitation, muscular fasciculation, apathy.

Treatment

Local treatment: Initial treatment: Symptomatic.
Systemic treatment: Initial treatment: Symptomatic.
Monitor: Respiratory and cardiac functions.
In case of ingestion gastric lavage should be considered in cases of significant ingestions only within the first 2 hours. However, the application of activated charcoal and sodium sulphate is always advisable.
Keep respiratory tract clear.
Oxygen or artificial respiration if needed.
In case of convulsions, a benzodiazepine (e.g. diazepam) should be given according to standard regimens.

If not effective, phenobarbital may be used.
Contraindication: atropine.
Contraindication: derivatives of adrenaline.
There is no specific antidote.
Recovery is spontaneous and without sequelae.

SECTION 5. FIRE FIGHTING MEASURES

Suitable extinguishing media
Water spray
Alcohol-resistant foam
Dry chemical
Carbon dioxide

Extinguishing media which should not be used for safety reasons
High volume water jet.

Hazards from combustion products
Dangerous gases are evolved in the event of a fire.

Precautions for fire-fighting
In the event of fire, wear self-contained breathing apparatus.
Remove product from areas of fire, or otherwise cool containers with water in order to avoid pressure being built up due to heat.
Whenever possible, contain fire-fighting water by diking area with sand or earth.

Hazchem Code •3Z

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Keep people away from and upwind of spill/leak.
Avoid contact with spilled product or contaminated surfaces.
When dealing with a spillage do not eat, drink or smoke.

Environmental precautions
Do not allow to get into surface water, drains and ground water.

Methods for cleaning up
Keep in suitable, closed containers for disposal.
Clean floors and contaminated objects with plenty of water.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

Additional advice
Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.
Check also for any local site procedures.

SECTION 7. HANDLING AND STORAGE

Handling
Hygiene measures:
When using, do not eat, drink or smoke.
Remove soiled clothing immediately and clean thoroughly before using again.
Contaminated work clothing should not be allowed out of the workplace.
Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.
Wash hands immediately after work, if necessary take a shower.

Advice on protection against fire and explosion:
Keep away from heat and sources of ignition.
Vapours may form explosive mixture with air.

Storage
Requirements for storage areas and containers:
Keep out of the reach of children.
Store in a place accessible by authorized persons only.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep away from direct sunlight.
Protect from freezing.

Advice on common storage:
Keep away from food, drink and animal feedingstuffs.

Suitable materials:
Coex EVOH (1000L IBC)

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Control parameters	Update	Basis
Deltamethrin	52918-63-5	0.02 mg/m^3 (TWA)		OES BCS

For further details on the Occupational Exposure Standards, see Section 16.

Observe: Exposure Limits In Air, Group 3: 100 mg/m³/ 20 ppm. (aromatic-rich hydrocarbon mixes with > 25 % aromatics TRGS 901, No. 72).

Personal protective equipment - End user
Respiratory protection: No personal respiratory protective equipment normally required.

Hand protection: Elbow-length PVC or nitrile gloves.

Eye protection: Face-shield or goggles.

Skin and body protection: Cotton overall buttoned to the neck and wrist.
Impervious footwear.

Engineering Controls
Advice on safe handling:

No specific precautions required when handling unopened packs/containers; follow relevant manual handling advice.
Ensure adequate ventilation.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form:	Suspension, opaque
Colour:	Off-white
Odour:	Strong, characteristic

Safety data

pH:	3.5 - 5.0 at 100 % (23 °C)
pH:	4.5 - 7.5 at 1 % (23 °C)
Flash point:	No data available.
Ignition temperature:	> 450 °C The data refer to solvent naphtha petroleum.
Upper explosion limit:	7.00 %(V) The data refer to solvent naphtha petroleum.
Lower explosion limit:	0.8 % (V) The data refer to solvent naphtha petroleum.
Vapour pressure:	No data available.
Relative vapour density:	1.00 The data refer to solvent naphtha petroleum.
Density	ca. 1.00 g/cm³ at 20 °C
Water solubility	Miscible
Partition coefficient: n-octanol/water:	No data available
Viscosity, dynamic:	<= 30 mPa.s at 20 °C Velocity gradient 7.5 /s
Viscosity, kinematic:	ca. 3 mm^2/s at 40 °C
Surface tension:	ca. 25.7 mN/m at 40 °C

SECTION 10. STABILITY AND REACTIVITY

Chemical stability:	Stable under recommended storage conditions.
Conditions to avoid:	Extremes of temperature and direct sunlight.

Hazardous reactions: No hazardous reactions when stored and handled according to prescribed instructions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity: LD_{50} (rat) 304 mg/kg

Acute inhalation toxicity: LC_{50} (rat) > 5.80 mg/l
Exposure time: 4 h
Highest attainable concentration.

Acute dermal toxicity: LD_{50} (rat) > 5,000 mg/kg

Skin irritation: Slight irritant effect - does not require labelling (rabbit).

Eye irritation: Slight irritant effect - does not require labelling (rabbit).

Sensitisation: Non-sensitizing (guinea pig).
OECD Test Guideline 406, Buehler test

Further information

Cutaneous sensations may occur, such as burning or stinging on the face and mucosae. However, these sensations cause no lesions and are of a transitory nature (max. 24 hours).

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish: LC_{50} (*Cyprinus carpio* (Carp)) 0.0539 mg/L
Exposure time: 96 h

Toxicity to aquatic invertebrates: EC_{50} (*Daphnia magna* (Water flea)) 0.00056 mg/L
Exposure time: 48 h
The value mentioned relates to the active ingredient deltamethrin.

Toxicity to aquatic plants: EC_{50} (Algae) > 9.1 mg/L
Exposure time: 72 h
The value mentioned relates to the active ingredient deltamethrin.

Bioaccumulation: *Lepomis macrochirus* (Bluegill sunfish)
Bioconcentration factor (BCF): 1,400
The value mentioned relates to the active ingredient deltamethrin.

SECTION 13. DISPOSAL CONSIDERATIONS

Metal drums and plastic containers

Triple or preferably pressure rinse containers before disposal. Add rinsings to spray tank. Do not dispose of undiluted chemicals on site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt.

SECTION 14. TRANSPORT INFORMATION

ADG

UN-Number	**3082**
Class	9
Subsidiary Risk	None
Packaging group	III
Description of the goods	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (DELTAMETHRIN SOLUTION)
Hazchem Code	•3Z

According to AU01, Environmentally Hazardous Substances in packagings, IBC or any other receptacle not exceeding 500 kg or 500 L are not subject to the ADG Code.

IMDG

UN-Number	**3082**
Class	9
Subsidiary Risk	None
Packaging group	III
EmS	F-A , S-F
Marine pollutant	YES
Description of the goods	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (DELTAMETHRIN SOLUTION)

IATA

UN-Number	**3082**
Class	9
Subsidiary Risk	None
Packaging group	III
Environm. Hazardous Mark	YES
Description of the goods	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (DELTAMETHRIN SOLUTION)

SECTION 15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Code Act 1994.

Australian Pesticides and Veterinary Medicines Authority approval number: 63246.

See also Section 2.

SECTION 16. OTHER INFORMATION

Trademark information

Aqua-K-Othrine® is registered trademark of Bayer.

This MSDS summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.

Further details on the Occupational Exposure Standards mentioned in Section 8:
CEILING: Ceiling Limit Value
OES BCS: Internal Bayer CropScience "Occupational Exposure Standard"
PEAK: Exposure Standard - Peak means a maximum or peak airborne concentration of a particular substance determined over the shortest analytically practicable period of time which does not exceed 15 minutes.
STEL: Exposure standard - short term exposure limit (STEL): A 15 minute TWA exposure which should not be exceeded at any time during a working day even if the eight-hour TWA average is within the TWA exposure standard. Exposures at the STEL should not be longer than 15 minutes and should not be repeated more than four times per day. There should be at least 60 minutes between successive exposures at the STEL.
SKIN_DES: Skin notation: Absorption through the skin may be a significant source of exposure.
TWA: Exposure standard - time-weighted average (TWA): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

END OF MSDS