EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN NONANE

Novachem Pty Ltd

Chemwatch Hazard Alert Code: 3

Version No: **2.2**
Safety Data Sheet according to Work Health and Safety Regulations (Hazardous Chemicals) 2023 and ADG requirements

Initial Date: **20/11/2025**
Revision Date: **20/11/2025**
Print Date: **20/11/2025**
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SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN NONANE
Synonyms	Not Available
Proper shipping name	NONANES
Other means of identification	ES-5465-A-5X

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	For professional use only

Details of the manufacturer or importer of the safety data sheet

Registered company name	**Novachem Pty Ltd**	**Novachem Pty Ltd**
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255	+61384151255
Fax	+61386250088	+61386250088
Website	www.novachem.com.au	www.novachem.com.au
Email	novachem@novachem.com.au	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	**Victorian Poisons Information Centre**	**Victorian Poisons Information Centre**
Emergency telephone number(s)	13 11 26	13 11 26
Other emergency telephone number(s)	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification [1]	Flammable Liquids Category 3, Aspiration Hazard Category 1, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Acute Toxicity (Inhalation) Category 4, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Specific Target Organ Toxicity - Single Exposure (Narcotic Effects) Category 3, Specific Target Organ Toxicity - Repeated Exposure Category 2, Hazardous to the Aquatic Environment Long-Term Hazard Category 1
Legend:	***1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI***

Label elements

Hazard pictogram(s)	
Signal word	**Danger**

Hazard statement(s)

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H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area.
P240	Ground and bond container and receiving equipment.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P331	Do NOT induce vomiting.
P370+P378	In case of fire: Use alcohol resistant foam or normal protein foam to extinguish.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

No further product hazard information.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
111-84-2	99.99818	n-nonane
5103-73-1	0.00007	CIS-NONACHLOR (13C10, 98%)
60-57-1	0.00007	dieldrin
27304-13-8	0.00007	oxychlordane
143-50-0	0.00007	chlordecone
1031-07-8	0.00007	endosulfan sulfate
93952-14-8	0.00007	hexachlorobenzene-13C6
319-86-8	0.00007	1,2,3,4,5,6-hexachlorocyclohexane
39765-80-5	0.00007	trans-nonachlor
72-55-9	0.00007	2,2-bis(4-chlorophenyl)-1,1-dichloroethylene
319-85-7	0.00007	1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)
789-02-6	0.00007	o,p'-DDT
33213-65-9	0.00007	beta-endosulfan
959-98-8	0.00007	alpha-endosulfan
2385-85-5	0.00007	mirex
309-00-2	0.00007	aldrin
1024-57-3	0.00007	heptachlor epoxide
76-44-8	0.00007	heptachlor
50-29-3	0.00007	DDT
72-20-8	0.00007	endrin
5103-74-2	0.00007	gamma-chlordane
53-19-0	0.00007	mitotane
3424-82-6	0.00007	2,2-bis(chlorophenyl)-1,1-dichloroethylene
608-93-5	0.00007	pentachlorobenzene
319-84-6	0.00007	1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)
72-54-8	0.00007	1,1-dichloro-2,2-bis(p-chlorophenyl)ethane
58-89-9	0.00007	lindane

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Legend:	***1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available***

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Wash out immediately with fresh running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: ▸ Immediately remove all contaminated clothing, including footwear. ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay.
Ingestion	▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice. ▸ Avoid giving milk or oils. ▸ Avoid giving alcohol. ▸ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

Indication of any immediate medical attention and special treatment needed

For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:

- Primary threat to life, from pure petroleum distillate ingestion and/or inhalation, is respiratory failure.
- Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO2 50 mm Hg) should be intubated.
- Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
- A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
- Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
- Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients. [Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 Firefighting measures

Extinguishing media

Special hazards arising from the substrate or mixture

Fire Incompatibility	▸ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Fire Fighting	
Fire/Explosion Hazard	▸ Liquid and vapour are flammable. ▸ Moderate fire hazard when exposed to heat or flame. ▸ Vapour forms an explosive mixture with air. ▸ Moderate explosion hazard when exposed to heat or flame. Combustion products include: carbon monoxide (CO) carbon dioxide (CO2) other pyrolysis products typical of burning organic material.
HAZCHEM	3Y

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▸ Remove all ignition sources. ▸ Clean up all spills immediately. ▸ Avoid breathing vapours and contact with skin and eyes. ▸ Control personal contact with the substance, by using protective equipment.
Major Spills	▸ Clear area of personnel and move upwind. ▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear breathing apparatus plus protective gloves.

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	▸ Prevent, by any means available, spillage from entering drains or water course.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	The conductivity of this material may make it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m., Whether a liquid is nonconductive or semi-conductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. ▸ Containers, even those that have been emptied, may contain explosive vapours. ▸ Do NOT cut, drill, grind, weld or perform similar operations on or near containers. · Electrostatic discharge may be generated during pumping - this may result in fire. · Ensure electrical continuity by bonding and grounding (earthing) all equipment. · Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m/sec until fill pipe submerged to twice its diameter, then <= 7 m/sec). · Avoid splash filling. ▸ Avoid all personal contact, including inhalation. ▸ Wear protective clothing when risk of overexposure occurs. ▸ Use in a well-ventilated area. ▸ Prevent concentration in hollows and sumps. ▸ **DO NOT** allow clothing wet with material to stay in contact with skin
Other information	▸ Store in original containers in approved flammable liquid storage area. ▸ Store away from incompatible materials in a cool, dry, well-ventilated area. ▸ **DO NOT** store in pits, depressions, basements or areas where vapours may be trapped. ▸ No smoking, naked lights, heat or ignition sources.

Conditions for safe storage, including any incompatibilities

Suitable container	▸ Packing as supplied by manufacturer. ▸ Plastic containers may only be used if approved for flammable liquid. ▸ Check that containers are clearly labelled and free from leaks. ▸ For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure. ▸ For materials with a viscosity of at least 2680 cSt. (23 deg. C) ▸ For manufactured product having a viscosity of at least 250 cSt.
Storage incompatibility	Low molecular weight alkanes are a type of chemical compounds that can be found in gases or liquids. These alkanes: ▸ Can cause a dangerous reaction with strong oxidizers, chlorine, chlorine dioxide, and dioxygenyl tetrafluoroborate when there is oxygen and heat present. ▸ Are incompatible with halogens. ▸ Can create static charges due to their low conductivity, leading to an accumulation of static charge. ▸ On contact with iron or rust, heptachlor produces hydrogen chloride gas. ▸ Avoid reaction with oxidising agents

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	n-nonane	Nonane	200 ppm / 1050 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	dieldrin	Dieldrin	0.25 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aldrin	Aldrin	0.25 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	heptachlor	Heptachlor	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	DDT	DDT (Dichlorodiphenyl-trichloroethane)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	endrin	Endrin	0.1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	lindane	Lindane	0.008 ppm / 0.1 mg/m3	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
n-nonane	Not Available	Not Available
CIS-NONACHLOR (13C10, 98%)	Not Available	Not Available
dieldrin	50 mg/m3	Not Available
oxychlordane	Not Available	Not Available
chlordecone	Not Available	Not Available
endosulfan sulfate	Not Available	Not Available
hexachlorobenzene-13C6	Not Available	Not Available
1,2,3,4,5,6-hexachlorocyclohexane	Not Available	Not Available
trans-nonachlor	Not Available	Not Available
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	Not Available	Not Available

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Ingredient	Original IDLH	Revised IDLH
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	Not Available	Not Available
o,p'-DDT	Not Available	Not Available
beta-endosulfan	Not Available	Not Available
alpha-endosulfan	Not Available	Not Available
mirex	Not Available	Not Available
aldrin	25 mg/m3	Not Available
heptachlor epoxide	Not Available	Not Available
heptachlor	35 mg/m3	Not Available
DDT	500 mg/m3	Not Available
endrin	2 mg/m3	Not Available
gamma-chlordane	Not Available	Not Available
mitotane	Not Available	Not Available
2,2-bis(chlorophenyl)-1,1-dichloroethylene	Not Available	Not Available
pentachlorobenzene	Not Available	Not Available
1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	Not Available	Not Available
1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	Not Available	Not Available
lindane	50 mg/m3	Not Available

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment.
Individual protection measures, such as personal protective equipment	
Eye and face protection	‣ Safety glasses with side shields. ‣ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ‣ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.
Skin protection	See Hand protection below
Hands/feet protection	‣ Wear chemical protective gloves, e.g. PVC. ‣ Wear safety footwear or safety gumboots, e.g. Rubber The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice. Personal hygiene is a key element of effective hand care. ‣ Neoprene gloves
Body protection	See Other protection below
Other protection	‣ Overalls. ‣ PVC Apron. ‣ PVC protective suit may be required if exposure severe. ‣ Eyewash unit. ‣ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity. ‣ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets). ‣ Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.

Respiratory protection

Type AB-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the 'Exposure Standard' (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AB-AUS P2	-	AB-PAPR-AUS / Class 1 P2
up to 50 x ES	-	AB-AUS / Class 1 P2	-
up to 100 x ES	-	AB-2 P2	AB-PAPR-2 P2 ^

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

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- Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Not Available

Physical state	Liquid	**Relative density (Water = 1)**	0.718
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	205
pH (as supplied)	Not Available	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	-53	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	151	**Molecular weight (g/mol)**	128.3
Flash point (°C)	31	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Flammable.	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	2.9	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	0.87	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	0.124	**Gas group**	Not Available
Solubility in water	Immiscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available
Heat of Combustion (kJ/g)	Not Available	**Ignition Distance (cm)**	Not Available
Flame Height (cm)	Not Available	**Flame Duration (s)**	Not Available
Enclosed Space Ignition Time Equivalent (s/m3)	Not Available	**Enclosed Space Ignition Deflagration Density (g/m3)**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

a) Acute Toxicity	There is sufficient evidence to classify this material as acutely toxic.
b) Skin Irritation/Corrosion	There is sufficient evidence to classify this material as skin corrosive or irritating.
c) Serious Eye Damage/Irritation	There is sufficient evidence to classify this material as eye damaging or irritating
d) Respiratory or Skin sensitisation	Based on available data, the classification criteria are not met.
e) Mutagenicity	Based on available data, the classification criteria are not met.
f) Carcinogenicity	Based on available data, the classification criteria are not met.
g) Reproductivity	Based on available data, the classification criteria are not met.
h) STOT - Single Exposure	There is sufficient evidence to classify this material as toxic to specific organs through single exposure
i) STOT - Repeated Exposure	There is sufficient evidence to classify this material as toxic to specific organs through repeated exposure
j) Aspiration Hazard	There is sufficient evidence to classify this material as an aspiration hazard

Inhaled	Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo. Inhalation of heptachlor dust causes irritability, tremors and collapse. Technical heptachlor is a central nervous system depressant Inhalation hazard is increased at higher temperatures.

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	Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination. Central nervous system (CNS) depression may include general discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal. Concentrated nonane vapours may cause irritation of the nose and throat, headache, drowsiness, dizziness, confusion, nausea, tremors, incoordination and difficulty in breathing. Very high concentrations may cause unconsciousness and death. The odour of nitrous oxides is not easily detected. Nerve damage can be caused by some non-ring hydrocarbons. Symptoms are temporary, and include weakness, tremors, increased saliva, some convulsions, excessive tears with discolouration and inco-ordination lasting up to 24 hours.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. Isoparaffinic hydrocarbons cause temporary lethargy, weakness, inco-ordination and diarrhoea. Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Central nervous system (CNS) depression may include general discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal.
Skin Contact	This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition Dermal toxicity of heptachlor is increased dramatically when dissolved in solvent. Skin exposure to isoparaffins may produce slight to moderate irritation in animals and humans. Rare sensitisation reactions in humans have occurred. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. The liquid may be able to be mixed with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives.
Eye	This material causes serious eye irritation. Instillation of isoparaffins into rabbit eyes produces only slight irritation.
Chronic	Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Implantation studies in rats show that paraffin oils may cause tumours. As a general rule, the highly refined paraffins are believed to contain less suspect polyaromatic hydrocarbons than less refined grades or waxes derived from napthenic base-stocks. The symptoms of chronic heptachlor poisoning include tremors, inco-ordination, convulsions, kidney damage, failure of breathing and even death. Animal testing shows that it may cause cancer in some species, notably of the liver; it has also caused thyroid tumours.

EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN NONANE

TOXICITY	IRRITATION
Not Available	Not Available

n-nonane

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
Inhalation (Rat) LC50: 3200 ppm4h[2]	Skin (Mammal - pig): 250uL/24H - Mild
Oral (Rat) LD50: >5000 mg/kg[1]	Skin (Rodent - rat): 300uL/4D - Moderate
	Skin: adverse effect observed (irritating)[1]

CIS-NONACHLOR (13C10, 98%)

TOXICITY	IRRITATION
Not Available	Not Available

dieldrin

TOXICITY	IRRITATION
dermal (rat) LD50: 56 mg/kg[2]	Not Available
Inhalation (Rat) LC50: 0.013 mg/L4h[2]	
Oral (Rat) LD50: 38.3 mg/kg[2]	

oxychlordane

TOXICITY	IRRITATION
Oral (Rat) LD50: 20 mg/kg[2]	Not Available

chlordecone

TOXICITY	IRRITATION
dermal (rat) LD50: >2000 mg/kg[2]	Not Available
Oral (Rat) LD50: 95 mg/kg[2]	

endosulfan sulfate

TOXICITY	IRRITATION
Oral (Rat) LD50: 18 mg/kg[2]	Not Available

hexachlorobenzene-13C6

TOXICITY	IRRITATION
Not Available	Not Available

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1,2,3,4,5,6-hexachlorocyclohexane	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: 900 mg/kg[2]	Not Available
	Inhalation (Rat) LC50: 0.69 mg/L4h[2]	
	Oral (Mouse) LD50; 49 mg/kg[2]	
trans-nonachlor	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 500 mg/kg[2]	Not Available
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	**TOXICITY**	**IRRITATION**
	Oral (Mouse) LD50; 700 mg/kg[2]	Not Available
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 2000 mg/kg[2]	Not Available
o,p'-DDT	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
beta-endosulfan	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 240 mg/kg[2]	Not Available
alpha-endosulfan	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 76 mg/kg[2]	Not Available
mirex	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 800 mg/kg[2]	Not Available
	Oral (Hamster) LD50; 125 mg/kg[2]	
aldrin	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 15 mg/kg[2]	Not Available
	Oral (Rat) LD50: 39 mg/kg[2]	
heptachlor epoxide	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 144 mg/kg[2]	Not Available
	Oral (Rat) LD50: 15 mg/kg[2]	
heptachlor	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: 119 mg/kg[2]	Not Available
	Oral (Rat) LD50: 40 mg/kg[2]	
DDT	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 300 mg/kg[2]	Not Available
	Oral (Rat) LD50: 87 mg/kg[2]	
endrin	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: 12 mg/kg[2]	Not Available
	Oral (Rat) LD50: 3 mg/kg[2]	
gamma-chlordane	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 275 mg/kg[2]	Not Available
mitotane	**TOXICITY**	**IRRITATION**
	Oral (Mouse) LD50; >4000 mg/kg[2]	Not Available

Continued...

2,2-bis(chlorophenyl)-1,1-dichloroethylene	

TOXICITY	IRRITATION
Oral (Rat) LD50: 880 mg/kg[2]	Not Available

pentachlorobenzene	

TOXICITY	IRRITATION
dermal (rat) LD50: >2500 mg/kg[2]	Not Available
Oral (Rat) LD50: 1080 mg/kg[2]	

1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	

TOXICITY	IRRITATION
Oral (Mouse) LD50; 78 mg/kg[2]	Not Available

1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	

TOXICITY	IRRITATION
Dermal (rabbit) LD50: 1200 mg/kg[2]	Not Available
Oral (Rat) LD50: 113 mg/kg[2]	

lindane	

TOXICITY	IRRITATION
Dermal (rabbit) LD50: 50 mg/kg[2]	Not Available
Inhalation (Rat) LC50: 1.56 mg/l4h[2]	
Oral (Rat) LD50: 76 mg/kg[2]	

Legend:	***1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances***

CHLORDECONE	Reproductive effector in rats. Carcinogenic by RTECS criteria.
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. ***[* The Pesticides Manual, Incorporating The Agrochemicals Handbook, 10th Edition, Editor Clive Tomlin, 1994, British Crop Protection Council]***
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (BETA ISOMER)	Somnolence, ataxia, dyspnea recorded.
O,P'-DDT	**NOTE:** Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.
HEPTACHLOR EPOXIDE	Carcinogenic by RTECS criteria
HEPTACHLOR	for technical grade ADI: 0.0005 mg/kg/day
DDT	ADI: 0.002 mg/kg/day NOEL: 0.25 mg/kg/day **WARNING:** This substance has been classified by the IARC as Group 2A: Probably Carcinogenic to Humans.
ENDRIN	Reproductive effector in rats ADI: 0.0002 mg/kg/day
MITOTANE	Dermatitis after system exposure, effects on fertility, effects on embryo/ foetus, specific developmental effects (central nervous system, eye, ear, craniofacial, endocrine system, urogenital system) recorded. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).
PENTACHLOROBENZENE	General anaesthesia, tremor, paternal effects, specific developmental abnormalities (musculoskeletal) recorded. Chlorobenzenes produce several clinical symptoms including eye and airway irritation, blood disorders, abnormal skin changes and foetal defects at levels toxic to the mother. They are well absorbed in the stomach, gut and airways, and well metabolised and excreted in the urine. Lethal doses may produce breathing failure and damage to the liver, kidneys, adrenal glands, mucous membranes, and brain.
1,1-DICHLORO-2,2-BIS(P-CHLOROPHENYL)ETHANE	Tremor, convulsions, excitement, primary irritation recorded.
LINDANE	ADI: 0.003 mg/kg/day NOEL: 0.31 mg/kg/day
EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN NONANE & N-NONANE & TRANS-NONACHLOR & MITOTANE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.
EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN NONANE & N-NONANE	Animal studies indicate that normal, branched and cyclic paraffins are absorbed from the gastrointestinal tract and that the absorption of n-paraffins is inversely proportional to the carbon chain length, with little absorption above C30. With respect to the carbon chain lengths likely to be present in mineral oil, n-paraffins may be absorbed to a greater extent than iso- or cyclo-paraffins. The major classes of hydrocarbons are well absorbed into the gastrointestinal tract in various species. In many cases, the hydrophobic hydrocarbons are ingested in association with fats in the diet. Some hydrocarbons may appear unchanged as in the lipoprotein particles in the gut lymph, but most hydrocarbons partly separate from fats and undergo metabolism in the gut cell. Animal testing showed exposure to high concentrations (over 3500 parts per million) of C9 to C13 alkanes in air caused inco-ordination, seizures and spasms. Cerebellar damage was found on autopsy in some animals. It appears that exposure may possibly damage the central nervous system.
EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN	For heptachlor and its degradates: Heptachlor has moderate to high toxicity when swallowed and moderate toxicity on skin contact. It is not reported to irrritate the skin or eyes. Like many organochlorines, it interferes with nerve transmission and may cause an increase in activity of enzymes involved in the breakdown of foreign chemicals. This may lead to serious toxicity from drugs taken for medical reasons.

Continued...

NONANE & HEPTACHLOR EPOXIDE & HEPTACHLOR	
DIELDRIN & ALDRIN	ADI: 0.0001 mg/kg/day
DIELDRIN & ALDRIN & ENDRIN	The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
CHLORDECONE & 2,2-BIS(4-CHLOROPHENYL)-1,1-DICHLOROETHYLENE & O,P'-DDT & MIREX & MITOTANE & 1,1-DICHLORO-2,2-BIS(P-CHLOROPHENYL)ETHANE	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions.
CHLORDECONE & MIREX	For mirex and chlordecone: Mirex and chlordecone are structurally similar insecticides, and cause similar toxicity in a number of organs but their toxic profiles also contain differences. The main acute affect is diarrhoea. Inhalation may cause chest pain, made worse on breathing in. Skin exposure often results in a red, blistery rash. Mirex and chlordecone are toxic to the liver.
CHLORDECONE & 2,2-BIS(4-CHLOROPHENYL)-1,1-DICHLOROETHYLENE & O,P'-DDT & MIREX & HEPTACHLOR & MITOTANE & 1,1-DICHLORO-2,2-BIS(P-CHLOROPHENYL)ETHANE	**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.
ENDOSULFAN SULFATE & BETA-ENDOSULFAN & ALPHA-ENDOSULFAN	Endosulfan is highly toxic if swallowed. Animal testing seems to indicate that low protein in the diet is associated with much increased susceptibility to endosulfan toxicity. Absorption is more rapid in the presence of alcohols, oils and emulsifiers. The main characteristic of poisoning is stimulation of the central nervous system.
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE & 1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (BETA ISOMER) & 1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (ALPHA ISOMER) & LINDANE	551indane **WARNING:** This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**.
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE & 1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (BETA ISOMER) & MIREX & 1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (ALPHA ISOMER) & LINDANE	Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [***National Toxicology Program: U.S. Dep. of Health & Human Services 2002***]
O,P'-DDT & DDT	For DDT: DDT is moderately to slightly toxic to studied mammalian species via the oral route. Toxicity will vary according to formulation . DDT is readily absorbed through the gastrointestinal tract, with increased absorption in the presence of fats . One-time administration of DDT to rats at doses of 50 mg/kg led to decreased thyroid function and a single dose of 150 mg/kg led to increased blood levels of liver-produced enzymes and changes in the cellular chemistry in the central nervous system of monkeys.
O,P'-DDT & 2,2-BIS(CHLOROPHENYL)-1,1-DICHLOROETHYLENE & 1,1-DICHLORO-2,2-BIS(P-CHLOROPHENYL)ETHANE	Side-reactions during manufacture of the parent compound may result in the production of trace amounts of polyhalogenated aromatic hydrocarbon(s). Halogenated phenols, and especially their alkali salts, can condense above 300 deg. Polyhalogenated aromatic hydrocarbons (PHAHs) can cause effects on hormones and mimic thyroid hormone. Acne, discharge in the eye, eyelid swellings and visual disturbances may occur.
ALDRIN & HEPTACHLOR EPOXIDE	**NOTE:** The substance is classified under EC Directive on Dangerous Substances (67/548/EEC): Possible risk of irreversible effects, (substances suspected of being carcinogenic and/or mutagenic)

Acute Toxicity	✔	**Carcinogenicity**	✘
Skin Irritation/Corrosion	✔	**Reproductivity**	✘
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	✔
Respiratory or Skin sensitisation	✘	**STOT - Repeated Exposure**	✔
Mutagenicity	✘	**Aspiration Hazard**	✔

Legend: ✘ ***– Data either not available or does not fill the criteria for classification***
✔ ***– Data available to make classification***

SECTION 12 Ecological information

Toxicity

EXPANDED POPS PESTICIDES CLEANUP SPIKE W/ ENDOSULFAN SULFATE (13C,99%)500 NG/ML IN NONANE

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

n-nonane

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.4mg/l	2
NOEC(ECx)	504h	Crustacea	0.17mg/l	2
LC50	96h	Fish	0.11mg/l	2

Continued...

CIS-NONACHLOR (13C10, 98%)

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

dieldrin

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1680h	Fish	4860-14500	7
EC50	48h	Crustacea	<0.001mg/L	4
EC50	96h	Algae or other aquatic plants	>0.1mg/L	4
EC50(ECx)	168h	Crustacea	<0.001mg/L	5
LC50	96h	Fish	<0.001mg/L	4

oxychlordane

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.86-1.96mg/L	4
EC50(ECx)	48h	Crustacea	0.86-1.96mg/L	4
LC50	96h	Fish	0.002mg/L	4

chlordecone

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.03-0.16mg/L	4
NOEC(ECx)	96h	Crustacea	<0.001mg/L	4
LC50	96h	Fish	0.015-0.021mg/L	4

endosulfan sulfate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	96h	Crustacea	0.092mg/L	4
LC50	96h	Fish	0.001-0.002mg/L	4
EC50	48h	Crustacea	0.87-0.97mg/l	4

hexachlorobenzene-13C6

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

1,2,3,4,5,6-hexachlorocyclohexane

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1680h	Fish	327-893	7
EC50	48h	Crustacea	0.68mg/L	4
NOEC(ECx)	145.44h	Crustacea	0.002mg/L	4
LC50	96h	Fish	0.008-0.01mg/L	4

trans-nonachlor

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.022mg/L	4
EC50(ECx)	48h	Crustacea	0.022mg/L	4

2,2-bis(4-chlorophenyl)-1,1-dichloroethylene

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.028mg/L	4
NOEC(ECx)	672h	Fish	<0.001mg/L	4
LC50	96h	Fish	0.026-0.04mg/L	4

1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	2160h	Fish	0.032mg/L	4
LC50	96h	Fish	1-3.55mg/L	4

o,p'-DDT

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	336h	Fish	<0.001mg/L	4

beta-endosulfan

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	96h	Fish	0.008-0.01mg/L	4
LC50	96h	Fish	0.003-0.004mg/L	4

alpha-endosulfan

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	96h	Fish	<0.001mg/L	4
LC50	96h	Fish	<0.001mg/L	4

Continued...

mirex

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	2880h	Fish	0.002mg/L	5
EC50	48h	Crustacea	>0.1mg/l	4
LC50	96h	Fish	0.016-0.034mg/L	4

aldrin

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1680h	Fish	1550-9450	7
EC50	48h	Crustacea	<0.001mg/L	4
EC50(ECx)	48h	Crustacea	<0.001mg/L	4
LC50	96h	Fish	<0.001mg/L	4

heptachlor epoxide

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	1h	Algae or other aquatic plants	>200mg/l	4
LC50	96h	Fish	0.004-0.007mg/L	4

heptachlor

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1680h	Fish	2020-15600	7
EC50	48h	Crustacea	<0.001mg/L	4
EC50	96h	Algae or other aquatic plants	0.027mg/L	4
EC50(ECx)	48h	Crustacea	<0.001mg/L	4
LC50	96h	Fish	0.001-0.006mg/L	4

DDT

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1680h	Fish	5100-24400	7
EC50	48h	Crustacea	<0.001mg/L	4
NOEC(ECx)	6384h	Fish	<0.001mg/L	5
LC50	96h	Fish	<0.001mg/L	4

endrin

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1680h	Fish	2360-12600	7
EC50	48h	Crustacea	<0.001mg/L	4
EC50(ECx)	96h	Fish	<0.001mg/L	5
LC50	96h	Fish	<0.001mg/L	4

gamma-chlordane

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.031-0.082mg/L	4

mitotane

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

2,2-bis(chlorophenyl)-1,1-dichloroethylene

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

pentachlorobenzene

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1344h	Fish	1130-5070	7
EC50	72h	Algae or other aquatic plants	1.55mg/l	4
EC50	48h	Crustacea	<=0.02mg/L	4
EC50	96h	Algae or other aquatic plants	1.255-9.236mg/L	4
NOEC(ECx)	1008h	Fish	0.005mg/L	5
LC50	96h	Fish	0.135mg/L	4

1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.6-1mg/L	4
EC50(ECx)	288h	Crustacea	0.05-0.19mg/L	4
EC50	96h	Algae or other aquatic plants	>10mg/L	4
LC50	96h	Fish	0.82-1.51mg/L	4

Continued...

1,1-dichloro-2,2-bis(p-chlorophenyl)ethane

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48h	Crustacea	0.002mg/L	4
EC50(ECx)	240h	Crustacea	<0.001mg/L	5
LC50	96h	Fish	0.002-0.004mg/L	4

lindane

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.001mg/L	4
EC50	72h	Algae or other aquatic plants	3.2mg/L	4
EC50	48h	Crustacea	160.048mg/l	1
EC50	96h	Algae or other aquatic plants	1.62mg/L	4
NOEC(ECx)	48h	Crustacea	120.048mg/l	1

Legend: ***Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data***

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
for heptachlor and its degradates
log Kow: 4.4-7.248
log Koc: 4.48
Koc: 30000
Half-life (hr) air: 6
Half-life (hr) H2O surface water: 23.1
Half-life (hr) soil: 3504-7008
Henry's atm m3 /mol: 1.48E-03
BCF: 200-37000
Breakdown in soil and groundwater: Heptachlor and heptachlor epoxide are highly persistent in soils, with a reported representative field half-life of 250 days. Data suggests a soil half-life for heptachlor of 0.4 to 0.8 years. The mean disappearance rates of heptachlor from soil ranged from 5.25 to 79.5% per year, depending upon the soil type and mode of application. The highest rates of degradation were observed in sandy soils following an application of a granular formulation.
When spilled this product may act as a typical oil, causing a film, sheen, emulsion or sludge at or beneath the surface of the body of water. The oil film on water surface may physically affect the aquatic organisms, due to the interruption of the
oxygen transfer between the air and the water
Oils of any kind can cause:

- drowning of water-fowl due to lack of buoyancy, loss of insulating capacity of feathers, starvation and vulnerability to predators due to lack of mobility
- lethal effects on fish by coating gill surfaces, preventing respiration
- asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom and
- adverse aesthetic effects of fouled shoreline and beaches

In case of accidental releases on the soil, a fine film is formed on the soil, which prevents the plant respiration process and the soil particle saturation. It may cause deep water infestation.
When released in the environment, alkanes don't undergo rapid biodegradation, because they have no functional groups (like hydroxyl or carbonyl) that are needed by most organisms in order to metabolize the compound.
However, some bacteria can metabolise some alkanes (especially those linear and short), by oxidizing the terminal carbon atom. The product is an alcohol, that could be next oxidised to an aldehyde, and finally to a carboxylic acid. The resulting fatty acid could be metabolised through the fatty acid degradation pathway.
Environmental Fate:
Terrestrial Fate: If released on land, n-nonane will be immobile and will volatilize from moist and dry soil surfaces based upon its physico-chemical properties. However, volatilization will be attenuated by its adsorption to soil. In the event that volatilization is not possible then biodegradation of the compound will take place.
Aquatic Fate: If released to water, n-nonane is expected to volatilize from water surfaces and will also be adsorbed to suspended solids and sediment.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
n-nonane	LOW	LOW
dieldrin	HIGH (Half-life = 2160 days)	LOW (Half-life = 1.69 days)
chlordecone	HIGH (Half-life = 1440 days)	Not Available
endosulfan sulfate	HIGH	HIGH
1,2,3,4,5,6-hexachlorocyclohexane	HIGH (Half-life = 270 days)	LOW (Half-life = 3.85 days)
trans-nonachlor	HIGH	HIGH
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	HIGH (Half-life = 11250 days)	LOW (Half-life = 1.7 days)
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	HIGH (Half-life = 248 days)	LOW (Half-life = 3.85 days)
o,p'-DDT	HIGH	HIGH
beta-endosulfan	HIGH	HIGH
mirex	HIGH	HIGH
aldrin	HIGH (Half-life = 1183.33 days)	LOW (Half-life = 0.38 days)
heptachlor epoxide	HIGH (Half-life = 1104 days)	LOW (Half-life = 2.5 days)
heptachlor	LOW (Half-life = 5.39 days)	LOW (Half-life = 0.41 days)
DDT	HIGH (Half-life = 11250 days)	LOW (Half-life = 7.38 days)
endrin	HIGH	HIGH
gamma-chlordane	HIGH	HIGH
mitotane	HIGH	HIGH

Continued...

Ingredient	Persistence: Water/Soil	Persistence: Air
2,2-bis(chlorophenyl)-1,1-dichloroethylene	HIGH	HIGH
pentachlorobenzene	HIGH (Half-life = 690 days)	HIGH (Half-life = 453.21 days)
1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	HIGH (Half-life = 270 days)	LOW (Half-life = 3.85 days)
1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	HIGH (Half-life = 11250 days)	LOW (Half-life = 5.54 days)
lindane	HIGH (Half-life = 240.21 days)	LOW (Half-life = 3.85 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
n-nonane	HIGH (LogKOW = 5.65)
dieldrin	HIGH (BCF = 14500)
chlordecone	HIGH (LogKOW = 5.41)
endosulfan sulfate	LOW (LogKOW = 3.66)
1,2,3,4,5,6-hexachlorocyclohexane	MEDIUM (BCF = 893)
trans-nonachlor	HIGH (LogKOW = 6.35)
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	HIGH (LogKOW = 6.51)
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	MEDIUM (BCF = 893)
o,p'-DDT	HIGH (LogKOW = 6.79)
beta-endosulfan	MEDIUM (LogKOW = 3.83)
alpha-endosulfan	MEDIUM (LogKOW = 3.83)
mirex	LOW (LogKOW = 7.18)
aldrin	HIGH (BCF = 20000)
heptachlor epoxide	HIGH (LogKOW = 4.98)
heptachlor	HIGH (BCF = 17300)
DDT	HIGH (BCF = 4020)
endrin	HIGH (BCF = 12600)
gamma-chlordane	HIGH (LogKOW = 6.22)
mitotane	HIGH (LogKOW = 5.8734)
2,2-bis(chlorophenyl)-1,1-dichloroethylene	HIGH (LogKOW = 6)
pentachlorobenzene	HIGH (BCF = 6840)
1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	MEDIUM (BCF = 893)
1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	HIGH (LogKOW = 6.02)
lindane	MEDIUM (BCF = 1400)

Mobility in soil

Ingredient	Mobility
n-nonane	LOW (Log KOC = 934.6)
dieldrin	LOW (Log KOC = 10600)
chlordecone	LOW (Log KOC = 17520)
endosulfan sulfate	LOW (Log KOC = 824)
1,2,3,4,5,6-hexachlorocyclohexane	LOW (Log KOC = 3380)
trans-nonachlor	LOW (Log KOC = 146200)
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	LOW (Log KOC = 152500)
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	LOW (Log KOC = 3380)
o,p'-DDT	LOW (Log KOC = 224900)
beta-endosulfan	LOW (Log KOC = 48.16)
mirex	LOW (Log KOC = 472900)
aldrin	LOW (Log KOC = 105600)
heptachlor	LOW (Log KOC = 52410)
DDT	LOW (Log KOC = 220300)
endrin	LOW (Log KOC = 10600)
gamma-chlordane	LOW (Log KOC = 86650)
mitotane	LOW (Log KOC = 155600)

Continued...

Ingredient	Mobility
2,2-bis(chlorophenyl)-1,1-dichloroethylene	LOW (Log KOC = 155600)
pentachlorobenzene	LOW (Log KOC = 2002)
1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	LOW (Log KOC = 3380)
1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	LOW (Log KOC = 152500)
lindane	LOW (Log KOC = 3380)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: ▸ Reduction ▸ Reuse ▸ Recycling ▸ Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. ▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority. ▸ Recycle wherever possible. ▸ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. ▸ Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material). ▸ Decontaminate empty containers.

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	
HAZCHEM	3Y

Land transport (ADG)

14.1. **UN number or ID number**	1920
14.2. **UN proper shipping name**	NONANES
14.3. **Transport hazard class(es)**	Class: 3 Subsidiary Hazard: Not Applicable
14.4. **Packing group**	III
14.5. **Environmental hazard**	Environmentally hazardous
14.6. **Special precautions for user**	Special provisions: Not Applicable Limited quantity: 5 L

Air transport (ICAO-IATA / DGR)

14.1. **UN number**	1920
14.2. **UN proper shipping name**	Nonanes
14.3. **Transport hazard class(es)**	ICAO/IATA Class: 3 ICAO / IATA Subsidiary Hazard: Not Applicable ERG Code: 3L
14.4. **Packing group**	III
14.5. **Environmental hazard**	Environmentally hazardous
14.6. **Special precautions for user**	Special provisions: Not Applicable

Continued...

Cargo Only Packing Instructions	366
Cargo Only Maximum Qty / Pack	220 L
Passenger and Cargo Packing Instructions	355
Passenger and Cargo Maximum Qty / Pack	60 L
Passenger and Cargo Limited Quantity Packing Instructions	Y344
Passenger and Cargo Limited Maximum Qty / Pack	10 L

Sea transport (IMDG-Code / GGVSee)

14.1. **UN number**	1920
14.2. **UN proper shipping name**	NONANES
14.3. **Transport hazard class(es)**	IMDG Class: 3 IMDG Subsidiary Hazard: P
14.4. **Packing group**	III
14.5 **Environmental hazard**	Marine Pollutant
14.6. **Special precautions for user**	EMS Number: F-E, S-E Special provisions: Not Applicable Limited Quantities: 5 L

14.7. Maritime transport in bulk according to IMO instruments

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
n-nonane	Not Applicable
CIS-NONACHLOR (13C10, 98%)	Not Applicable
dieldrin	Not Applicable
oxychlordane	Not Applicable
chlordecone	Not Applicable
endosulfan sulfate	Not Applicable
hexachlorobenzene-13C6	Not Applicable
1,2,3,4,5,6-hexachlorocyclohexane	Not Applicable
trans-nonachlor	Not Applicable
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	Not Applicable
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	Not Applicable
o,p'-DDT	Not Applicable
beta-endosulfan	Not Applicable
alpha-endosulfan	Not Applicable
mirex	Not Applicable
aldrin	Not Applicable
heptachlor epoxide	Not Applicable
heptachlor	Not Applicable
DDT	Not Applicable
endrin	Not Applicable
gamma-chlordane	Not Applicable
mitotane	Not Applicable
2,2-bis(chlorophenyl)-1,1-dichloroethylene	Not Applicable
pentachlorobenzene	Not Applicable
1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	Not Applicable
1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	Not Applicable
lindane	Not Applicable

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
n-nonane	Not Applicable

Continued...

Product name	Ship Type
CIS-NONACHLOR (13C10, 98%)	Not Applicable
dieldrin	Not Applicable
oxychlordane	Not Applicable
chlordecone	Not Applicable
endosulfan sulfate	Not Applicable
hexachlorobenzene-13C6	Not Applicable
1,2,3,4,5,6-hexachlorocyclohexane	Not Applicable
trans-nonachlor	Not Applicable
2,2-bis(4-chlorophenyl)-1,1-dichloroethylene	Not Applicable
1,2,3,4,5,6-hexachlorocyclohexane (beta isomer)	Not Applicable
o,p'-DDT	Not Applicable
beta-endosulfan	Not Applicable
alpha-endosulfan	Not Applicable
mirex	Not Applicable
aldrin	Not Applicable
heptachlor epoxide	Not Applicable
heptachlor	Not Applicable
DDT	Not Applicable
endrin	Not Applicable
gamma-chlordane	Not Applicable
mitotane	Not Applicable
2,2-bis(chlorophenyl)-1,1-dichloroethylene	Not Applicable
pentachlorobenzene	Not Applicable
1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer)	Not Applicable
1,1-dichloro-2,2-bis(p-chlorophenyl)ethane	Not Applicable
lindane	Not Applicable

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

n-nonane is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

CIS-NONACHLOR (13C10, 98%) is found on the following regulatory lists

Not Applicable

dieldrin is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

oxychlordane is found on the following regulatory lists

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

chlordecone is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination

endosulfan sulfate is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7

Continued...

Chemical Footprint Project - Chemicals of High Concern List

hexachlorobenzene-13C6 is found on the following regulatory lists

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

1,2,3,4,5,6-hexachlorocyclohexane is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

trans-nonachlor is found on the following regulatory lists

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

2,2-bis(4-chlorophenyl)-1,1-dichloroethylene is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

1,2,3,4,5,6-hexachlorocyclohexane (beta isomer) is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

o,p'-DDT is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Chemical Footprint Project - Chemicals of High Concern List

beta-endosulfan is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Chemical Footprint Project - Chemicals of High Concern List
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination

alpha-endosulfan is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Chemical Footprint Project - Chemicals of High Concern List
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination

mirex is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination

aldrin is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

heptachlor epoxide is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Continued...

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List

heptachlor is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

DDT is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants (POPs) - Annex B: Restriction
United Nations List of Prior Informed Consent Chemicals

endrin is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination

gamma-chlordane is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

mitotane is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4

2,2-bis(chlorophenyl)-1,1-dichloroethylene is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

pentachlorobenzene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Industrial Chemicals Environmental Management (IChEMS Register) Instrument 2022 - Schedule 7 - Relevant industrial chemicals that are likely to cause serious or irreversible harm to the environment with no essential uses
Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
Stockholm Convention on Persistent Organic Pollutants (POPs) - Annex C: Unintentional Production

1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer) is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

1,1-dichloro-2,2-bis(p-chlorophenyl)ethane is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

lindane is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

Continued...

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
Stockholm Convention on Persistent Organic Pollutants - Annex A - Elimination
United Nations List of Prior Informed Consent Chemicals

Additional Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; hexachlorobenzene-13C6; trans-nonachlor; gamma-chlordane; pentachlorobenzene)
Canada - DSL	No (CIS-NONACHLOR (13C10, 98%); dieldrin; oxychlordane; chlordecone; endosulfan sulfate; hexachlorobenzene-13C6; 1,2,3,4,5,6-hexachlorocyclohexane; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; 1,2,3,4,5,6-hexachlorocyclohexane (beta isomer); o,p'-DDT; beta-endosulfan; alpha-endosulfan; mirex; aldrin; heptachlor epoxide; heptachlor; DDT; endrin; gamma-chlordane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; 1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer); 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane)
Canada - NDSL	No (n-nonane; CIS-NONACHLOR (13C10, 98%); dieldrin; oxychlordane; chlordecone; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; 1,2,3,4,5,6-hexachlorocyclohexane (beta isomer); o,p'-DDT; beta-endosulfan; alpha-endosulfan; mirex; aldrin; heptachlor epoxide; heptachlor; DDT; endrin; gamma-chlordane; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; pentachlorobenzene; 1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer); 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane; lindane)
China - IECSC	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; beta-endosulfan; alpha-endosulfan; heptachlor epoxide; gamma-chlordane; mitotane; 1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer))
Europe - EINEC / ELINCS / NLP	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; beta-endosulfan; alpha-endosulfan)
Japan - ENCS	No (CIS-NONACHLOR (13C10, 98%); endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; o,p'-DDT; heptachlor epoxide; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane)
Korea - KECI	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; chlordecone; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; o,p'-DDT; beta-endosulfan; alpha-endosulfan; mirex; heptachlor epoxide; gamma-chlordane; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; pentachlorobenzene; 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane)
New Zealand - NZIoC	No (CIS-NONACHLOR (13C10, 98%); dieldrin; oxychlordane; chlordecone; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; beta-endosulfan; alpha-endosulfan; mirex; aldrin; heptachlor epoxide; heptachlor; DDT; endrin; gamma-chlordane; pentachlorobenzene; lindane)
Philippines - PICCS	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; endosulfan sulfate; hexachlorobenzene-13C6; 1,2,3,4,5,6-hexachlorocyclohexane; trans-nonachlor; 1,2,3,4,5,6-hexachlorocyclohexane (beta isomer); o,p'-DDT; beta-endosulfan; alpha-endosulfan; mirex; heptachlor epoxide; gamma-chlordane; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; pentachlorobenzene; 1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer))
USA - TSCA	TSCA Inventory 'Active' substance(s) (n-nonane; 1,2,3,4,5,6-hexachlorocyclohexane; 1,2,3,4,5,6-hexachlorocyclohexane (beta isomer); DDT; pentachlorobenzene; 1,2,3,4,5,6-hexachlorocyclohexane (alpha isomer); lindane); No (CIS-NONACHLOR (13C10, 98%); dieldrin; oxychlordane; chlordecone; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; o,p'-DDT; beta-endosulfan; alpha-endosulfan; mirex; aldrin; heptachlor epoxide; heptachlor; endrin; gamma-chlordane; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane)
Taiwan - TCSI	No (CIS-NONACHLOR (13C10, 98%); hexachlorobenzene-13C6; trans-nonachlor)
Mexico - INSQ	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; o,p'-DDT; beta-endosulfan; alpha-endosulfan; heptachlor epoxide; gamma-chlordane; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene)
Vietnam - NCI	No (chlordecone; mirex)
Russia - FBEPH	No (CIS-NONACHLOR (13C10, 98%); oxychlordane; chlordecone; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; o,p'-DDT; beta-endosulfan; alpha-endosulfan; mirex; aldrin; heptachlor epoxide; endrin; gamma-chlordane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene; pentachlorobenzene; 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane)
UAE - Control List (Banned/Restricted Substances)	No (n-nonane; CIS-NONACHLOR (13C10, 98%); oxychlordane; endosulfan sulfate; hexachlorobenzene-13C6; trans-nonachlor; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; o,p'-DDT; beta-endosulfan; alpha-endosulfan; heptachlor epoxide; gamma-chlordane; mitotane; 2,2-bis(chlorophenyl)-1,1-dichloroethylene)
Legend:	***Yes = All CAS declared ingredients are on the inventory*** ***No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.***

SECTION 16 Other information

Revision Date	20/11/2025
Initial Date	20/11/2025

SDS Version Summary

Version	Date of Update	Sections Updated
1.2	20/11/2025	Hazards identification - Classification, Composition / information on ingredients - Ingredients

Other information

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

- PC—TWA: Permissible Concentration-Time Weighted Average
- PC—STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit。

Continued...

- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration
- MARPOL: International Convention for the Prevention of Pollution from Ships
- IMSBC: International Maritime Solid Bulk Cargoes Code
- IGC: International Gas Carrier Code
- IBC: International Bulk Chemical Code

- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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