File No: STD/1456

August 2013

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Chemical in OLOA 19049

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Department of Health and Ageing, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Public Report is also available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

Street Address:	Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX	+ 61 2 8577 8888
Website:	www.nicnas.gov.au

Director
NICNAS

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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
STD/1456	Cintox Australia Pty Ltd	Chemical in OLOA 19049	ND*	≤ 10 tonnes per annum	Additive for lubricating oil

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available information, the notified chemical is not recommended for classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Human health risk assessment
Under the conditions of the occupational settings described, the notified chemical is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified chemical is not considered to pose an unreasonable risk to public health.

Environmental risk assessment
On the basis of the assessed use pattern, the notified chemical is not considered to pose an unreasonable risk to the environment.

Recommendations

REGULATORY CONTROLS

(Material) Safety Data Sheet

- A (M)SDS for the product containing the notified chemical should be provided by the notifier to NICNAS as soon as it becomes available.

CONTROL MEASURES
Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced in finished oil and additive packages:
  - Avoid direct skin and eye contact with the products
  - Avoid generation of aerosols during reformulation
  - Clean up spills promptly

- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced in the finished oil and additive packages:
  - Protective clothing
  - Impervious gloves
  - Safety glasses

  Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the (M)SDS should be easily accessible to employees.

- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Disposal

- The notified chemical should be disposed of in accordance with local regulations for recycling, re-use or recovery of calorific content.

Emergency procedures

- Spills or accidental release of the notified chemical should be handled by physical containment, collection and subsequent safe disposal.

Regulatory Obligations

Secondary Notification
This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(1) of the Act: if
- data becomes available on the irritation potential of the notified chemical;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the chemical has changed from being an additive for lubricating oil, or is likely to change significantly;
- the amount of chemical being introduced has increased or is likely to increase significantly;
- the chemical has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the chemical on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

(Material) Safety Data Sheet
The (M)SDS of the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Cintox Australia Pty Ltd (ABN: 63 122 874 613)
Suite 1, Level 2, 38-40 George Street
Parramatta NSW 2150

NOTIFICATION CATEGORY
Standard: Chemical other than polymer (more than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, analytical data, degree of purity, impurities, additives/adjuvants, use details, import volume, site of reformulation and identity of recipients.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows: melting point/boiling point, specific gravity/density, vapour pressure, partition co-efficient, absorption/desorption, dissociation constant, flash point, flammability limits, autoignition temperature, explosive properties and oxidising properties

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
Canada (2012)
USA (2003)

2. IDENTITY OF CHEMICAL

MARKETING NAME
OLOA 19049

OTHER NAME
Alkane diol

MOLECULAR WEIGHT
< 500 Da

ANALYTICAL DATA
Reference NMR and HPLC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY > 60%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: White solid (product containing > 60% notified chemical)

Property	Value	Data Source/Justification
Melting Point/Freezing Point	40 - 70°C*	Measured
Boiling Point	> 240°C at 101.3 kPa*	Measured
Density	959 kg/m^3 at 21°C*	Measured
Vapour Pressure	5.8 × 10^{-3} Pa at 25°C*	Measured
Water Solubility	3.0 × 10^{-4} g/L at 20°C*	Measured
Hydrolysis as a Function of pH	Not determined	Does not contain readily hydrolysable functionalities
Partition Coefficient (n-octanol/water)	log Pow = 4.67 - 5.51 at 40°C*	Measured

Adsorption/Desorption	log K_{oc} = 3.49 at 25°C*	Measured
Dissociation Constant	Not determined	Does not contain dissociable functional groups
Particle Size	Not determined	Imported in solutions
Flash Point	193 ± 2°C at 101.3 kPa*	Measured
Flammability	Not highly flammable*	Measured
Autoignition Temperature (Liquids and gases)	268 ± 5°C*	Measured
Autoignition Temperature (Solids)	No relative self-ignition temperature below melting point*	Measured
Explosive Properties	Not determined	Predicted to be negative, contains no functional groups that would imply explosive properties.
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties.

* Measured on a product containing > 60% notified chemical

DISCUSSION OF PROPERTIES
For full details of tests on physical and chemical properties, refer to Appendix A.

Reactivity
The notified chemical is expected to be stable under normal conditions of use.

Physical hazard classification
Based on the submitted physico-chemical data depicted in the above table, the notified chemical is not recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified chemical will not be manufactured in Australia. It will be imported as a component in either finished oil at a concentration < 1% or additive package at a concentration < 7%.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10

PORT OF ENTRY
Sydney, Melbourne, Perth and Brisbane

IDENTITY OF RECIPIENTS
Cintox Australia Pty Ltd

TRANSPORTATION AND PACKAGING
The finished oil and additive packages containing < 1% and < 7% notified chemical, respectively will be imported by marine vessel either:
1) in 20,000 litre ISO tanks and unloaded to tank trucks or railway containers for distribution, or
2) in drums (such as 205 litre steel drums) directly shipped to end-users.

USE
The notified chemical will be used as a lubricating oil additive in tractors.

OPERATION DESCRIPTION

Finished oil

Transportation

Upon the arrival of the finished oil containing <1% notified chemical in Australia, laboratory staff will take samples for testing. Then the finished oil will be typically loaded into tank trucks or railway containers by one worker. The product will be pumped into the tank trucks or railway containers from a storage tank through hard piping. Bulk tank truck or railway container filling will also be performed by 10 cm hosing. Special air back flush systems will be used to prevent spillage during transfer.

The finished oil will be sold to commercial end users in high volume. The finished oil will be distributed to service stations and tractor fleets in tank trucks (50%), drums (30%) and small containers (20%).

Transferring

Upon arrival of the tank trucks containing the finished oil to the end-users, the oil will be typically unloaded by one worker. The finished oil will be pumped out of the tank trucks into commercial storage tanks through hard piping.

Industrial and Commercial End-Use

The finished oil containing the notified chemical will be used mostly by industrial customers. During normal tractor maintenance, workers will check lubricant levels in the engines manually and top up the lubricant as needed using pneumatic delivery equipment. The notifier states that the industrial end users are expected to recycle used oil containing the notified chemical.

Oil containing the notified chemical will also be sold to commercial tractor service shops, where pneumatic pumps will be used to transfer it. Service station workers will check lubricant levels in the engine manually and top up the lubricant as needed. These workers will have access to appropriate engineering controls and personal protective equipment (PPE). The notifier states that commercial end-users are expected to recycle used oil containing the notified chemical from the engines during routine maintenance and repair work.

DIY use

The finished oil containing the notified chemical at < 1% in small containers will be sold to DIY consumers who change their own tractor lubricant.

Additive Packages

Transportation

Upon the arrival of the additive packages containing < 7% notified chemical, laboratory staff will take samples for testing. Then the additive product will be transferred from import containers into on-site storage tanks and then typically loaded into tank trucks or railway containers. The product will be pumped into the tank trucks or railway containers from a storage tank through hard piping.

Reformulation

At blending sites, laboratory staff will take samples of the additive product containing the notified chemical < 7% for testing. Transferring the additive from the tank trucks or railway containers will occur using a 10 cm hosing. A special air back flush system will be used to prevent spillage during the transfer. Spills incurred in the blending operations will be contained within concrete bunds and either recycled or sent for waste treatment.

Transfer from storage tanks to blending equipment will be automated, using computer controlled valves. The additive package containing < 7% notified chemical will be blended into the finished lubricant at a final concentration < 1.5%, depending on the end uses of the finished lubricant. The blending process occurs in a closed system at 60ºC. The blended lubricant containing < 1.5% notified chemical will be transferred automatically to a storage tank, packaged in drums or small containers for shipment.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and storage workers	0.5	30
Laboratory staff	0.17	220
Reformulation workers	0.5	220
Packaging and distribution workers	0.5	220

EXPOSURE DETAILS

Finished Oil

Transport and Storage
Transport workers are not expected to have potential for exposure to the notified chemical unless there is accidental release of the finished oil. Storage workers involved in the transfer of the finished oil containing the notified chemical may have potential for dermal, ocular and inhalation exposure to the notified chemical at concentration < 1%. PPE including coveralls, chemical gloves, face masks and safety glasses are recommended to reduce the possibility of exposure.

Product Transfer
Workers involved in the processes of transferring the finished oil containing the notified chemical may have potential for dermal, ocular and inhalation exposure to drips, spills and vapours bearing < 1% of the notified chemical. PPE including coveralls, chemical gloves, face masks and safety glasses are recommended to reduce the possibility of exposure. As the transfer facilities are well-ventilated with control systems for accidental spills, worker exposure to the notified chemical would be further reduced.

Laboratory Staff
During sampling and analysis of the finished oil, laboratory staff may have potential for dermal and ocular exposure to small quantity of finished oil containing < 1% notified chemical. PPE including safety glasses, chemical gloves and long sleeve lab coats are recommended.

Industrial and Commercial End-Use
Industrial and commercial end-users are the largest population groups having potential for exposure to the notified chemical. During operations that involve handling the finished oil containing the notified chemical, workers may have potential for dermal, ocular and inhalation exposures to drips, spills and vapours of the oil bearing < 1% of the notified chemical. Since the finished oil will be used mainly for the maintenance of the tractor engines, the facilities would be well-ventilated and adhering to ISO 9001 procedures. In addition workers would be wearing PPE including protective clothing, impervious gloves, safety glasses and face masks during the operations. Those engineering controls and protective measures would further reduce the potential for exposure to the notified chemical.

Additive Packages

Transport and Storage
Transport workers are not expected to have potential for exposure to the notified chemical except for accidental release of the liquid oil additive. Workers involved in the transfer of the liquid additive containing the notified chemical may have potential for dermal, ocular and inhalation exposure to the notified chemical at concentration < 7%. PPE including coveralls, chemical gloves, face masks and safety glasses are recommended to reduce the possibility of exposure.

Reformulation
In reformulation operations, procedures involved in the handling of the liquid containing the notified chemical

will be controlled with computerised automated system. That will reduce the potential for workers to be exposed to the notified chemical. During the process, the temperature of the liquid containing the notified chemical will be heated to 60ºC. Workers in blending facilities may have potential for dermal, ocular and inhalation exposure to the notified chemical at concentrations < 7%.

During the transfer and packaging of the finished oil after blending, workers may have potential for dermal, ocular and inhalation exposure to drips, spills and vapours of the oil containing < 1.5% of the notified chemical. PPE including coveralls, chemical gloves, face masks and safety glasses are recommended to reduce the possibility of exposure during reformulation and packaging.

End-Use
The exposure to the notified chemical by industrial and commercial users of the reformulated oils will be similar to that of users of imported oils, except that the concentration may be < 1.5% rather than 1%.

6.1.2. Public Exposure
The finished oil containing < 1.5% notified chemical in small containers will be sold to DIY consumers who change their own tractor oil. Public exposure to the notified chemical at low concentration is likely through dermal and ocular routes. Use of gloves and safety glasses when handling the finished oil would reduce the potential for exposure. Due to the low concentration of the notified chemical and relatively infrequent application, public exposure is not expected to be unreasonable.

6.2. Human Health Effects Assessment

No toxicity data were submitted for the notified chemical. Information available on chemicals from a structurally similar group A (diols) and a less similar group B (alcohols) are summarised below. Group A chemicals have the same functional group as the notified chemical. Group B chemicals do not contain an identical functional group, but do have some metabolites in common with the notified chemical.

Toxicokinetics, metabolism and distribution
Dermal penetration modelling on several Group A chemicals indicated the default values absorbed per 24 h were 80% to 40%. However, the absorption of the notified chemical is likely to be limited by the log Kow > 4. Group B chemicals are readily absorbed by all common routes of exposure. The skin penetration enhancement effect of the Group A chemicals has been demonstrated *in vitro*, and the notified chemical may act as a penetration enhancer for other chemicals under certain conditions.

Based on metabolism modelling of several Group A chemicals, it is likely that C-oxidation, C-hydroxylation, glucuronidation, and beta-oxidation may take place to form corresponding metabolites. C-hydroxylation and beta-oxidation are likely to be favoured metabolic pathways.

Acute toxicity
The acute oral and dermal toxicity of Group A chemicals was > 2,000 mg/kg, suggesting that the notified chemical would be of low toxicity via these routes. A Group B chemical was of low acute inhalation toxicity after 2 h exposure at 10% concentration. The notified chemical is therefore expected to be of low acute toxicity.

Irritation and sensitisation
Group A chemicals have shown potential for eye irritation/corrosion; however, it is not clear how this potential varies with chain length of the chemicals. A Group A chemical was a moderate skin irritant at 100% but non-sensitising in a LLNA and in a guinea pig maximisation test.

Repeated Dose Toxicity
In 28-day repeated dose oral studies, two Group A chemicals had NOAELs of 300 and 100 mg/kg bw/day, with effects related to irritation. A Group B chemical had a NOAEL of 1,000 mg/kg bw/day in a similar oral study.

Mutagenicity/Genotoxicity
Two Group A chemicals were reported to be negative in *in vitro* genotoxicity studies. A Group B chemical was negative in bacterial *in vitro* studies and an *in vivo* study.

Cytotoxicity
Group A chemicals showed cytotoxicity to Ehrlich ascites carcinoma cells and human erythrocytes.

Reproductive and developmental toxicity
Group B chemicals were not considered to cause adverse effects to reproductive or developmental parameters.

Health hazard classification
No toxicity data were provided for the notified chemical.

Based on the available information on the structurally similar Group A chemicals, the notified chemical is not recommended for classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety
The available data for analogue chemicals suggest that the notified chemical is likely to have irritation potential, especially to the eye. This potential is likely to be reduced by the low concentration of introduction and use (< 7%).

When handling the finished oil or the additive packages containing the notified chemical at < 1.5% or < 7% respectively, dermal, potentially ocular and inhalation exposure of workers to the notified chemicals may occur. As workers will be conducting operations with the notified chemical at < 7% concentration, direct skin and eye contact should be avoided through the use of PPE. When used in the proposed manner, the risk of the notified chemical to the health of the workers is not expected to be unreasonable.

6.3.2. Public Health
As the finished oil containing the notified chemical up to 1.5% will be available to DIY tractor users, dermal and ocular exposure of members of the public to the notified chemicals may occur. However, for the population of the DIY tractor users, the frequency of the oil change is relatively low. The irritation potential of the chemical is expected to be reduced by the low concentration in finished oils. Use of gloves and safety glasses would reduce any residual risk. Overall, the risk of the notified chemical to public health is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE
The notified chemical will be imported into Australia as finished lubricating oils or as solutions for reformulation into lubricant oils. Significant release of the notified chemical to the environment is not expected during transport and storage except in the unlikely event of accidental spills or leaks. It is estimated by the notifier that up to 0.3 g per year of the notified chemical may be released to aquatic environment from spills or leaks during loading of the finished oil onto transport vehicles.

Any notified chemical spilled during reformulation is expected to be contained with inert material and either sent to on-site waste treatment facilities or be reused in blending processes. At the on-site waste treatment facilities, residues of the notified chemical will be separated from the aqueous waste stream. The aqueous waste undergoes further treatment involving pond aeration and biological treatment before being released to the sewage system. The remaining non-aqueous waste is expected to be incinerated. As a result of these treatments, greater than 90% removal of the notified chemical is estimated by the notifier. Therefore, the accidental release from reformulation of the notified chemical and finished oils is unlikely to be significant.

RELEASE OF CHEMICAL FROM USE
The finished products containing the notified chemical will be used as a lubricating oil additive in tractor engines. The only release during its use may come from spills when pouring lubricant into tractor engines or leaks from the engines, which is expected to be negligible.

RELEASE OF CHEMICAL FROM DISPOSAL
After reformulation, empty import drums containing residues of the notified chemical (0.1% of the total import

volume) are expected to be steam cleaned, with the residual waste sent to on-site wastewater treatment facilities. Assuming 0.1% of the notified chemical remains in the empty drums after use, 10 kg/yr (10 tonnes/yr × 0.1%) of the notified substance will be sent to the on-site waste treatment. It is estimated by the notifier that up to 98% of the notified chemical may be removed during waste treatment processes. Therefore, the amount of the notified chemical released to sewer from the cleaning of empty drums is estimated to be 200 g/yr (= 10 kg/year × 2%). The wastewater will be further treated at the sewage treatment plants. Therefore, the release of the notified chemical to surface waters is expected to be limited from the cleaning of empty drums.

The major release of the notified chemical to the environment will come from inappropriate disposal of waste or used oils. Oil products containing the notified chemical will be poured into tractor engines by service station workers or by do-it-yourself (DIY) consumers. A survey by the Australian Institute of Petroleum (AIP, 1995) indicates that of the annual sales of engine oils in Australia, 60% of oils are potentially recoverable (i.e. not burnt in the engines during use). This report also indicates that around 86% of oil changes take place in specialised automotive service centres, where old oil drained from crankcases is disposed of responsibly (e.g. oil recycling or incineration). Assuming this is the case, negligible release of the notified chemical should result from these professional activities. The remaining 14% of oil is removed by DIY consumers. In these cases, some of the used oil would be either incinerated, left at transfer stations where it is again likely to be recycled, or deposited into landfill. It was estimated that DIY activities account for 7 - 10% of the unaccounted used oil (Meinhardt, 2002).

According to a survey tracing the fate of used lubricating oil in Australia (Snow 1997), only approximately 20% of used oil removed by DIY consumers is collected for recycling, approximately 25% is buried or disposed of in landfill, 5% is disposed of into stormwater drains and the remaining 50% is used in treating fence posts, killing grass and weeds or disposed of in other ways. In a worst case scenario involving the 14% of used oil removed by DIY consumers, up to 0.7% of the total import volume of the notified chemical may enter the aquatic environment via disposal to stormwater drains (= 14% × 5%). Therefore, the amount of the notified chemical released to the aquatic environment from disposal of used oil due to DIY consumers is expected to be 70 kg/yr (= 10 tonnes/year × 0.7%). In addition to this, considering the unknown fate of some of the oil used by DIY consumers, a small proportion may also be disposed of to sewer. Since the use of the lubricating oils will occur throughout Australia, all releases resulting from use or disposal of used oil will be very diffuse, and release of the notified chemical in neat concentrations is unlikely except as a result of transport accidents.

7.1.2. Environmental Fate

No environmental fate data were submitted for the notified chemical. The notified chemical does not contain any hydrolysable groups and is expected to be hydrolytically stable under environmental conditions. The measured biodegradation results for similar chemicals reviewed in an internationally peer-reviewed report indicate that the notified chemical has the potential to degrade significantly although it is unclear whether the 10-day window for ready biodegradability was passed. This conclusion is further supported by the modelled data using Biowin 4.0 (EPI Suite; US EPA, 2009). The modelling data indicate that the notified chemical is rapidly biodegradable.

Notified chemical released to water systems is expected to partition to sediment based on its limited water solubility and high adsorption/desorption coefficient (log Koc = 3.49). Some of notified chemical may be released to receiving waters. However, the notified chemical is expected to degrade in the environment. Sludge from the wastewater treatment plants containing the notified chemical is expected to be disposed of to landfill or applied to agricultural soils.

No reliable bioconcentration data are available. The notified chemical has a relatively high n-octanol/water partition coefficient (log Pow = 4.67 - 5.51) and low molecular weight (< 1,000 Da), implying that the notified chemical could be considered to be potentially bioaccumulative. However, bioconcnetraiton factors (BCF) calculated on the basis of log Pow does not take into account rapid biodegradability and metabolism of the notified chemical in the living organisms. Therefore, the BCF may be overestimated. Based on the endpoints measured for similar chemicals in an internationally peer-reviewed report, it is expected that the notified chemical will have a low potential for bioaccumulation.

The majority of the notified chemical will be either sent to landfill or thermally decomposed to recover the calorific value. In landfill, the notified chemical is not expected to leach from the soil due to the high adsorption/desorption coefficient (log Koc = 3.49) and low water solubility. The notified chemical is expected to rapidly degrade in landfill or be thermally decomposed to form water and oxides of carbon.

7.1.3. Predicted Environmental Concentration (PEC)

For the worst case scenario, the percentage of the imported quantity of notified chemical inappropriately disposed to stormwater drains is estimated to be 0.7%. That is, 14% (fraction collected by DIY users) × 5% (fraction disposed to stormwater). The release of the notified chemical may be up to 70 kg/year (= 10 tonnes/year × 0.7%). In this worst case scenario, it is assumed that the release goes into stormwater drains in a single metropolitan area with a geographical footprint of 500 km^2 and an average annual rainfall of 500 mm, all of which drains to stormwater. With a maximum annual release into this localised stormwater system of 70 kg and the annual volume of water drained from this region estimated to be 250 × 10^6 m^3, the calculated PEC will be up to 0.28 µg/L. This result reflects a worst-case scenario upper limit, as in reality releases of the notified chemical will be distributed over multiple regional/farming areas. Moreover, the notified chemical will be further diluted if it reaches the ocean.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted for the notified chemical. Based on the ecotoxicological results obtained for similar chemicals in an internationally peer-reviewed report, the notified chemical is not expected to have acute or chronic effects on aquatic organisms up to the limit of its water solubility.

The estimation procedure used here is based on data for similar chemicals and is considered acceptable for the purpose of risk assessment. However, this toxicity estimation is not considered sufficient to formally classify the acute and long term hazard of the notified chemical to aquatic life under the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS, United Nations, 2009).

7.2.1. Predicted No-Effect Concentration

A PNEC for the aquatic compartment has not been calculated since the notified chemical is not considered to be harmful up to the limit of its solubility in water based on the studies conducted on similar chemicals in an internationally peer-reviewed report.

7.3. Environmental Risk Assessment

The risk quotient (RQ = PEC/PNEC) has not been calculated. The notified chemical is not harmful up to the limit of its water solubility. Therefore, a PNEC value cannot be calculated. The notified chemical is not expected to persist in the environment due to its potential to biodegrade, and the notified chemical is not expected to bioaccumulate. Therefore, based on the assessed use pattern, the notified chemical is not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Melting Point/Freezing Point 40 - 70°C (Product containing > 60% notified chemical)

Method	OECD TG 102 Melting Point/Melting Range. EC Council Regulation No 440/2008 A.1 Melting/Freezing Temperature.
Remarks	Differential scanning calorimetry
Test Facility	Harlan (2012a)

Boiling Point > 240°C at 101.3 kPa (Product containing > 60% notified chemical)

Method	OECD TG 103 Boiling Point. EC Council Regulation No 440/2008 A.2 Boiling Temperature.
Remarks	The test substance decomposes from approximately 240°C.
Test Facility	Harlan (2012a)

Density 959 kg/m^3 at 21°C (Product containing > 60% notified chemical)

Method	OECD TG 109 Density of Liquids and Solids. EC Council Regulation No 440/2008 A.3 Relative Density.
Remarks	Relative density was determined to be 0.959 at 21.0 ± 0.5°C.
Test Facility	Harlan (2012a)

Vapour Pressure 5.8×10^{-3} Pa at 25°C (Product containing > 60% notified chemical)

Method	EC Council Regulation No 440/2008 A.4 Vapour Pressure.
Remarks	Seven tests were conducted and six of them were used to calculate the definitive vapour pressure.
Test Facility	Harlan (2012b)

Water Solubility 3×10^{-4} g/L at 20°C (Product containing > 60% notified chemical)

Method	OECD TG 105 Water Solubility.
Remarks	Flask Method. The preliminary test indicated that the column elution method should have been performed as the solubility was determined to be less than 0.01 g/L. However, it was not possible to use this method because the waxy test substance coated onto glass beads causes these beads to adhere together forming a plug within the column preventing water circulation. Therefore, the test substance was mixed with water in three separate flasks. The mixtures were shaken at 30°C, followed with standing for more than 24 hours at 20°C. Undissolved test substance was observed in the flasks. After filtration, the solutions were clear, colourless solutions and free from excess, undissolved test substance. The concentration of test substance in the solutions was determined by HPLC-MS. The pH of each solution was measured to be 5.5 - 5.7.
Test Facility	Harlan (2012a)

Partition Coefficient (n-octanol/water) log Pow = 4.67 - 5.51 at 40°C
(Product containing > 60% notified chemical)

Method	OECD TG 117 Partition Coefficient (n-octanol/water).
Remarks	HPLC Method. The test was conducted on a product containing two components including the notified chemical. Two peaks were observed for the test samples. Based on peak 1, the log Pow values were determined to be 4.67 - 4.70. Based on peak 2, the log Pow values were determined to be 5.49 - 5.51.
Test Facility	Harlan (2012a)

Adsorption/Desorption – screening test log Koc = 3.49 at 25°C

Method	OECD TG 121 Estimation of the Adsorption Coefficient (Koc) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC)
Remarks	HPLC Method. The test was conducted on a product containing two components including the notified chemical. Two peaks with the log Koc values of 2.84 and 3.49 were observed for the test samples. The log Koc for the notified chemical was reported to be 3.49.
Test Facility	CETC (2012)

Flash Point 193 ± 2°C at 101.3 kPa
(Product containing > 60% notified chemical)

Method	EC Council Regulation No 440/2008 A.9 Flash Point.
Remarks	Closed cup equilibrium method was used. The final result was corrected to a pressure of 101.325 kPa using the following equation: FP = C + 0.23 × (101.325 - B) FP: Corrected flash point C: Observed flash point B: Ambient atmosphere pressure (kPa)
Test Facility	Harlan (2012b)

Flammability (Solids) Not highly flammable (Product containing > 60% notified chemical)

Method	EC Council Regulation No 440/2008 A.10 Flammability (Solids).
Remarks	The result was obtained in a preliminary screening test.
Test Facility	Harlan (2012b)

Autoignition Temperature (Liquids and gases) 268 ± 5°C (Product containing > 60% notified chemical)

Method	EC Council Regulation No 440/2008 A.15 Auto-Ignition Temperature (Liquids and Gases).
Remarks	Orange flames and grey fumes were observed at approximately 268ºC
Test Facility	Harlan (2012b)

Autoignition Temperature (Solids) No relative self-ignition temperature below melting point
(Product containing > 60% notified chemical)

Method	EC Council Regulation No 440/2008 A.16 Relative self-ignition temperature for solids.
Remarks	Test substance melted with no ignition observed.
Test Facility	Harlan (2012b)

Explosive Properties Predicted negative

Method	EC Council Regulation No 440/2008 A.14 Explosive Properties.
Remarks	No structure alerts were found within the chemical structure
Test Facility	Harlan (2012b)

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