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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME
(NICNAS)**

FULL PUBLIC REPORT

NALCO TRASAR #3

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**Director
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TABLE OF CONTENTS

FULL PUBLIC REPORT	4
1. APPLICANT AND NOTIFICATION DETAILS	4
2. IDENTITY OF CHEMICAL	4
3. COMPOSITION.....	4
4. INTRODUCTION AND USE INFORMATION.....	4
5. PROCESS AND RELEASE INFORMATION.....	5
5.1. Distribution, transport and storage.....	5
5.2. Operation description.....	5
5.3. Occupational exposure.....	6
5.4. Release.....	7
5.5. Disposal	7
5.6. Public exposure.....	7
6. PHYSICAL AND CHEMICAL PROPERTIES.....	7
7. TOXICOLOGICAL INVESTIGATIONS	9
8. ENVIRONMENT.....	9
8.1. Environmental fate.....	9
8.2. Ecotoxicological investigations	9
9. RISK ASSESSMENT	10
9.1. Environment	10
9.1.1. Environment – exposure assessment.....	10
9.1.2. Environment – effects assessment	10
9.1.3. Environment – risk characterisation.....	10
9.2. Human health.....	10
9.2.1. Occupational health and safety – exposure assessment	11
9.2.2. Public health – exposure assessment.....	11
9.2.3. Human health – effects assessment.....	11
9.2.4. Occupational health and safety – risk characterisation	11
9.2.5. Public health – risk characterisation.....	11
10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS	11
10.1. Hazard classification.....	11
10.2. Environmental risk assessment	11
10.3. Human health risk assessment	11
10.3.1. Occupational health and safety.....	11
10.3.2. Public health.....	12
11. MATERIAL SAFETY DATA SHEET	12
11.1. Material Safety Data Sheet	12
11.2. Label	12
12. RECOMMENDATIONS.....	12
12.1. Secondary notification	12
13. BIBLIOGRAPHY	13

FULL PUBLIC REPORT

NALCO TRASAR #3

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Nalco Australia Pty Ltd (ABN 41 000 424 788) of 2 Anderson St. Botany NSW 2019.

NOTIFICATION CATEGORY

Limited-small volume: Chemical other than polymer, (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical identity

Composition

Import volume

Identity of manufacturing site(s)

Detailed manufacturing processes

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

LVC 591

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

NALCO TRASAR #3

3. COMPOSITION

DEGREE OF PURITY

MEDIUM

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

None

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (>1% by weight)

None

ADDITIVES/ADJUVANTS

None

4. INTRODUCTION AND USE INFORMATION

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

The notified chemical will be imported into Australia as a 30-60% water solution and as final products containing <1% concentration.

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

The notified chemical in a water solution (30-60%) is imported by sea in 60 L kegs. The imported product containing the notified chemical is transported by road to the formulation/re-packaging site(s).

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	<1	<1	<1	<1	<1

USE

The notified chemical is used in boiler water treatment.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY

Sydney

TRANSPORTATION AND PACKAGING

Finished products are packed into pails (approx 15 L capacity), drums (approx 200 L capacity) and tanks (750 – 1500 L capacity). Finished products are transported by road to warehouse site(s) and customer site(s) as required.

5.2. Operation description

Repacking imported products:

In the imported final products, the notified chemical is present at <1% and will be repackaged into various pack sizes (15 L to 1500 L) using automated pump and spear equipment. Sampling and analysis of imported and manufactured products will be undertaken by quality control chemists. The imported product and solution containing the notified chemical will be stored at the site(s) in a bunded and Australian Dangerous Goods (ADG) certified store.

Formulation:

Products containing the notified chemical (<1%) are formulated by gravity decanting the imported solution containing the notified chemical (30-60%) into the blending vessel. Decanting is undertaken in dedicated bunded areas and transported either manually or via ADG certified yard boxes to the blending vessel as required. Blending is undertaken by means of an automated system following manually and or automated charging of the blending vessel with batch ingredients as necessary.

After automated blending, the finished products are packed into various pack sizes using an automated filling system. Quality control chemists will undertake sampling and analysis of imported and manufactured products.

Salespersons:

Salesperson will handle products containing the notified chemical (<1%) while demonstrating the applications of the finished products.

End user operation in Australia:

The products containing the notified chemical (up to <1%) will be dosed to boiler feedwater typically by means of an automated closed feed systems with dedicated boiler feedwater pumps and transfer lines allowing direct chemical feed to the boiler or the feedwater system. Such industrial boilers characteristically include automatic blowdown control systems and allow for cycles of condensation with discharge of waste boiler water as necessary. It is expected that the necessity for boiler cleaning operations will be infrequent.

Target quantity of the notified chemical in the boiler feedwater is no more than trace amounts (no more than 0.001%). Auto or manual control of the dosing is achieved via measurement of the chemical nature of the notified chemical. With manual control, a hand-held detector is required and small samples (approximately 5ml) of boiler feed and blowdown water containing the notified chemical are sampled regularly.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Dockside/transport workers (Site A)	5-6	2-3	20-30
Dockside/transport workers (Site B)	1	2-3	1-5
Chemical operators (repacking) (Site A)	2	3	45
Chemical operator (repacking) (Site B)	1	3	8
Chemical operator (formulation) (Site A)	2	0.5	20
Chemical operator (formulation) (Site B)	1	0.5	7
Quality control chemist (Site A)	2	2	20
Quality control chemist (Site B)	1	2	8
Salespersons	70	0.5	60
Customer plant operators	70	1	240

Exposure Details

Import, transport and storage:

Products containing the notified chemical and 30-60% solution of the notified chemical (raw material for manufacture) are imported directly and transported by road to the site(s) of distribution and formulation, respectively. Finished products containing the notified chemical are transported by road to customers Australia-wide as required. Exposure is not expected during such operations except in cases of accidental puncture of imported containers.

Repacking:

Potential routes of exposure include dermal and accidental ocular exposure as a result of spills and splashes during transfer of the notified chemical via pump, flexible hose and spear from drums to various pack sizes. The concentration of notified chemical during such operations is no more than 1% during such operations and potential exposure will be limited by the use of PPE and the use of engineering controls such as an automated filling and re-packing system. All workers will wear personal protection equipment (PPE) such as chemical resistant gloves, safety glasses, safety boots, coveralls and respiratory protection as required. Workers will have access to the Material Safety Data Sheet (MSDS).

Formulation:

Potential routes of exposure up to 30-60% notified chemical include dermal and accidental ocular exposure as a result of spills and splashes during formulation operations. These operations involve transfers via gravity decanting from the drum to a small pail and from the small pail to the blending vessel. Potential exposure will be limited by the use of PPE and the use of engineering controls such as an automated and enclosed blending vessel and packing system. All workers will wear PPE such as chemical resistant gloves, safety glasses, safety boots, coveralls and respiratory protection as required. Workers will have access to the Material Safety Data Sheet (MSDS). All production batch sheets include relevant OH&S information consistent with the chemical nature of the batch ingredients is available to workers.

Quality Control:

Sampling and analysis of imported and manufactured products containing the notified chemical may result in potential dermal and accidental ocular exposure to up to 30-60% notified chemical as a result of accidental spills and splashes.

Salespersons:

Potential routes of exposure include dermal and accidental ocular exposure as a result manual testing of feed and blowdown water when using handheld detectors during demonstrations of the applications of the finished products (containing <1% notified chemical). Exposures to the notified chemical will depend on the boiler-system requirements and product use and include exposure to up to 1% of the notified chemical. Such workers will be trained in the use of the chemical, have access to the MSDS and wear PPE consistent with the recommendations of the MSDS.

Customer plant operator:

Potential routes of exposure include dermal and accidental ocular exposure to up to 1% notified chemical as a result of daily boiler treatments – with a similar though more frequent exposure scenario as salespersons. Dermal exposure may also result from drips and spills of treated boiler water (<0.001% notified chemical) as a result of attaching transfer lines, testing pumps, and calibrating feeding equipment.

5.4. Release

RELEASE OF CHEMICAL AT SITE

The notified chemical will be transported to Site A or B for formulation/repackaging into end-use products intended for use in boiler water treatment. The residues left in containers (pails/kegs) are rinsed out with water during the production process. The pails/kegs is then recycled by a third party recycling company or disposed of to landfill. The expected residual product containing the notified chemical from a production batch is in the region of 10-20 L corresponding to <0.1% of the notified chemical. This residual waste is handled by the effluent system at Site A. Any generated waste solution at Site A is pH adjusted (7-9), solids removed in sludge pits, analysed and diluted under local licensing (Trade Waste) agreement limits prior to discharge to ocean outfall.

At Site B, disposal of waste generated from products containing the notified chemical is conducted to local EPA requirements onto the work's grounds via spray irrigation.

RELEASE OF CHEMICAL FROM USE

The target concentration of the notified chemical in a boiler feedwater system is in the range of 1 to 10 ppb. It is expected that 1-2% of feedwater will go to blowdown water from an industrial boiler system. Cycles of concentration in the blowdown water is therefore in the range of 20 to 100 ppb. Therefore, a concentration range of 20 ppb to 1 ppm of the notified chemical is expected in the blowdown water which is subject to local Trade Waste agreements. Spent blowdown water is normally released into the sewer under Trade Waste agreements where it undergoes treatment at the local wastewater treatment plant. As such, all of the notified chemical will eventually be released into the sewer either directly, or by way of the end-user's on-site effluent treatment plants.

5.5. Disposal

The spent blowdown water containing the notified chemical will eventually be disposed of to sewer.

5.6. Public exposure

The 30-60% solution of the notified chemical is used only in the manufacture of products for industrial boiler water systems. The notified chemical is present in end use products at <1%. Only trained notifier personnel and operators on customer sites trained by notifier personnel will handle the end use product containing the notified chemical. No public exposure is expected except in the cases of accidental spills.

6. PHYSICAL AND CHEMICAL PROPERTIES

The notified chemical is never isolated and is present in solution with water. The physico-chemical properties refer to the water solution containing 30-60% of notified chemical. The physio-chemical properties of an acceptable analogue (the analogue chemical) which differs from the notified chemical only in the nature of the counter ion is also reported.

Appearance at 20°C and 101.3 kPa Brown liquid

Melting Point/Freezing Point 0°C at 101.3 kPa

METHOD

Remarks Consistent with the freezing point of water.

TEST FACILITY No reports submitted.

Boiling Point 100°C at 101.3 kPa

METHOD

Remarks Consistent with the boiling point of water.

TEST FACILITY	No reports submitted.
Density	1233-1353 kg/m ³ at 25°C
METHOD	OECD TG 109 Density of Liquids and Solids. EC Directive 92/69/EEC A.3 Relative Density.
Remarks	
TEST FACILITY	No reports submitted.
Vapour Pressure	3.1691 kPa at 25°C
METHOD	No reports submitted.
Remarks	Consistent with the vapour pressure of water.
TEST FACILITY	No reports submitted.
Water Solubility	> 400 g/L at 20°C
METHOD	Unspecified method
Remarks	The solubility of the analogue chemical is reported as 25 g/L (Feurstein 1963)
TEST FACILITY	No reports submitted
Hydrolysis as a Function of pH	Not determined
Remarks	Based upon the chemical nature of notified chemical, it is not expected to hydrolyse in the environmental pH 4-9.
Partition Coefficient (n-octanol/water)	Pow = 0.00002 (log Pow = -4.70)
METHOD	
Remarks	50 mL of 1% notified chemical was shaken with 50 mL octanol in a separating funnel. Fluorescence of the two layers were measured using a fluorometer after separation. 0.9310% test substance was detected in water and 0.0000019% in octanol. The partition coefficient was calculated to be approximately 0.00002.
TEST FACILITY	No reports submitted.
Adsorption/Desorption	Not determined
Remarks	The notifier indicates it is not expected to adsorb to soil as negatively charged substances will not adsorb to soil because most solid surfaces have negative net surface charges.
TEST FACILITY	No reports submitted.
Dissociation Constant	Similar to dissociation constants for the analogue chemical: Pka ₁ : 2.22, Pka ₂ : 4.34, Pka ₃ : 6.68
TEST FACILITY	Smith SA and Pretorius WA (2002)
Particle Size	Not determined
Remarks	The test is not applicable to a liquid.
Flash Point	Not determined
Remarks	The test is not applicable to a water solution
Flammability Limits	Not determined
Remarks	The test is not applicable to a water solution
Autoignition Temperature	Not determined

Remarks The test is not applicable to a water solution

Explosive Properties Not determined

Remarks The test is not applicable to a water solution. The notified chemical does not contain chemical groups that would infer explosive properties. Hence, the result has been predicted negative by expert interpretation.

Reactivity Not determined

Remarks Not expected to be reactive under normal conditions of use

7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data were submitted on the notified chemical. The analogue chemical is not listed on the List of Designated Hazardous Substances.

A summary of the toxicity studies for the analogue are presented below: (RTECS 2005)

<i>Endpoint and Result</i>	<i>Assessment Conclusion</i>
Rat, acute oral LD50 6721 mg/kg bw	low toxicity
Mouse acute oral LD50 4738 mg/kg bw	low toxicity
Rat TD- Route subcutaneous, dose 16 mg/kg/1 Y intermittent	Equivocal tumourogenic agent by RCTECS criteria, tumours at site of application.

Details of the study were not reported.

8. ENVIRONMENT

8.1. Environmental fate

A photodegradation study was submitted using a close analogue in solution (Landers and Reissig, 2002). This was performed in clear plastic cups at three concentrations (5 repeats of each concentration) which were left for 0, 0.5, 1, 2 and 3 h. A correlation coefficient was calculated based on the concentrations based on the emission readings. The results indicate an average 65% degradation over a 3 h period, irrespective of the concentration of the solution. The notifier has also provided results of the biodegradation study of the analogue. The results indicate the analogue was 65% biodegraded within 7 days and reached 100% by day 20 (Nalco 1998). On the basis of these results the analogue met the 10 day window criteria for ready biodegradability. The notified chemical is highly soluble in water and as a negative charged species is unlikely to adsorbed to soil.

8.2. Ecotoxicological investigations

A summary of the ecotoxicology data for a close analogue derived from the USEPA Ecotoxicology Database (http://www.epa.gov/med/prods_pubs.htm) and a literature article (Field *et al* 1995) is provided in the following table:

Organisms	Duration	LC50 mg/L
Channel cat fish*	96 h	2267, (1928-2670)
Bluegill sunfish*	96 h	3433, (2922-4028)
Rainbow trout*	96 h	1372, (1023-1840)
Medaka, high eye	48 h	3000
Flatfish flounder	96 h	997
Daphnia	48 h	337 (278-403)
Fish**	96 h	2200
Cladocera**	48 h	165
Algae**	96 h	<10

* Based on a 1969 literature paper (Marking 1969)

** These values are based on Structure Activity Relationships (SAR) toxicology summary (Field *et al* 1995)

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified chemical is considered to be highly soluble in water and is unlikely to partition to the non-aqueous phase. The usage patterns indicate that almost all of the notified chemical will ultimately enter the aquatic environment during end use, and with smaller amounts released during reformulation and repackaging.

During end-use, the notified chemical will pass through the boiler water systems during blowdown. The effluent will enter on-site effluent treatment facilities prior to being released into the sewer. Because boiler water blowdown volumes are variable and depend on the size of the industrial plant, a worst case risk assessment is performed based on maximum importation volumes and diffuse use patterns. Based on importation volumes of up to 1 tonne per annum of notified chemical that could be released into the sewer, a daily PEC in the sewer effluent is calculated to be 0.7 µg/L. In calculating the PEC, the following were assumed: (1) usage of the maximum import volume is evenly distributed over a 365 day period; (2) usage is nationwide, with a population of 20 million contributing 200 L of water per person per day to the sewer, (3) there is no adsorption or degradation in the sewer prior to release.

Based on the respective dilution factors of 1 and 10 for rural areas and coastal discharges of effluents, the PECs of the notified chemical in rural areas and coastal water may approximate 0.7 and 0.07 µg/L, respectively.

The notified chemical is highly water soluble and is unlikely to adsorb to soils/sediments. Based on its high water solubility and its expected ready photodegradability in water, the notified chemical is unlikely to bioaccumulate in aquatic environment.

9.1.2. Environment – effects assessment

The most sensitive species was algae with 96 h LC50 of <10 mg/L. A predicted no effect concentration (PNEC) of <10 µg/L has been derived by dividing the end point of <10 mg/L by a safety factor of 1000 (details of test reports were not submitted) .

9.1.3. Environment – risk characterisation

The risk quotients indicate an acceptable risk ($Q = 0.7 / <10 = >0.07$ for freshwater organisms) for both marine and freshwater organisms.

Given the low volume usage and the disperse use, the notified chemical is unlikely to pose an environmental risk under the proposed use pattern based on an import volume below 1 tonne per annum.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Transport and storage workers are not exposed to the notified chemical except in the event of an accident.

During reformulation and repackaging there is a potential for dermal and accidental ocular exposure to 30-60% of the notified chemical as a result of drips and spills during decanting and transfer of the imported solution to a mixing vessel. Such decanting and transfer would normally be of the order of liters or less and workers will be wearing protective clothing, safety glasses, gloves and footwear to minimise exposure. Little exposure is expected during QC operations and cleaning of equipment as the amounts will be small or diluted (<1% notified chemical). Safety glasses and gloves are worn when taking and handling these samples. Local exhaust ventilation will be employed and the packaging line will be automated.

Connection of product containers to water cooling systems by operators or sales representatives can potentially result in drips and spills. However, the notified chemical is at a concentration of < 1%, the spills will be likely to be small and intermittent, and the personnel at the customer site(s) will characteristically wear appropriate personal protective equipment such as safety gloves and safety glasses.

9.2.2. Public health – exposure assessment

The notified chemical will not be sold to the public. There is low potential for public exposure except in cases of transport accidents.

9.2.3. Human health – effects assessment

No toxicity data were provided for the notified chemical. A summary of the toxicity end points of an analogue chemical showed that it is of low acute toxicity and there are tumorigenic effects observed. These summaries need to be treated with caution, as details of the studies were not assessed.

9.2.4. Occupational health and safety – risk characterisation

The notified chemical is likely to be of low hazard to occupational health and safety of workers due to the limited exposure and the use of personal protective equipment described by the notifier. The risk of adverse health effects to transport and storage workers, formulation, QC and maintenance workers, end users and sales representatives is expected to be low.

9.2.5. Public health – risk characterisation

The risk of adverse health effects to public health is considered to be negligible as members of the public are unlikely to come into contact with the chemical as imported or when formulated for use.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Hazard classification

No toxicological data have been provided for the notified polymer and therefore the substance cannot be classified in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances. (NOHSC, 2004).

10.2. Environmental risk assessment

On the basis of the PEC/PNEC ratio: The chemical is not considered to pose a risk to the environment based on its reported use pattern.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the

occupational settings described.

10.3.2. Public health

There is Negligible Concern to public health based on its reported use pattern.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the products containing the notified chemical provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC 2003). They are published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the products containing the notified chemical provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC 1994). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced:
 - impervious gloves and 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 MSDS should be easily accessible to employees.
- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

Emergency procedures

- Soak up spill with absorbent material. Place residues in a suitable, covered, properly labelled container.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 64(1) of the Act; if

the importation volume exceeds one tonne per annum notified chemical the following additional data are required for the notified chemical;

- (a) appropriate ecotoxicity test reports, particularly acute toxicity to daphnia and algae
- (b) biodegradation study report
- (c) toxicity studies.

- (2) Under Section 64(2) of the Act:

- if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

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