

File No PLC/448

26 August 2004

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

FULL PUBLIC REPORT

Polymer in NALCO 98 AUS047

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 the Environment and Heritage.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
National Occupational Health and Safety Commission
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1161 or + 61 2 6279 1163.

This Full Public Report is 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:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, 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
Chemicals Notification and Assessment**

FULL PUBLIC REPORT

Polymer in NALCO 98 AUS047

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Nalco Australia Pty Ltd of 3 Anderson Street Banksmeadow NSW 2019.

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical name

Other names

CAS number

Molecular formula

Structural formula

Polymer constituents

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)

No

NOTIFICATION IN OTHER COUNTRIES

No

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in NALCO 98 AUS047

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	150	150	150	150	150

USE

The notified polymer is to be manufactured in Australia for use in the mineral processing industry to achieve solid/liquid separation in waste circuits by flocculating mineral slimes and leaving trace residual levels in surface waters.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

At the manufacturing site (Kwinana), the notified polymer is made by a batch process. The aqueous monomer phase and hydrocarbon oil/emulsifier phase are prepared separately and combined by mixing to form an emulsion in a reactor vessel, to which an initiator is added to trigger polymerisation. Once the reaction has been completed and meets specifications, the batch is cooled and pumped to storage. The notified polymer is typically present in the liquid latex as a 28% solution, these products are packaged into 5 tonne stainless steel transporters.

In a typical mine sands processing plant, sand containing about 10% heavy minerals is excavated and then conveyed to rotating trommels where it is mixed with water. Separated coarse sand and heavy minerals are concentrated using wet gravity techniques to produce 95% heavy mineral, which goes on for further treatment. The other waste stream is a slurry of very fine silt and clay known as "slimes". The notified polymer is added to aid solid/liquid separation of this stream and to allow the water to be recycled. A dilute solution of the notified polymer is dosed to an industrial thickener or dredge pond to achieve this separation. Residual slimes and sand are recombined in reclamation programs to create backfill that can be revegetated. The concentration of the notified polymer in the end use is less than 0.01%.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Manufacture

The notified polymer is manufactured and formulated at one site in Australia, the Nalco plant at Kwinana, WA. Waste generation sources are restricted to residual levels of latex after pump out in the reactor vessel, pumps and hoses. Any washing from the reactor and tanks are recycled and used in the manufacture of the next batch. The only release to the environment may be from spills, which will be soaked up with absorbent material and disposed to landfill. The notifier has not estimated the amount of polymer that may be lost due to spills, but it could be expected that up to 0.1% of the total volume of the product may be released in this way (< 150 kg/annum of the polymer).

After every third batch of polymer produced, a reactor boil out is conducted. The resultant alkali solution is sent to an intercept pit (on site) as one of various waste streams received. All plant effluent and any major spills are also sent to the intercept pit. The effluent is pumped to an effluent tank and used to spray irrigate the site lawns after its pH adjusted and solid content checked (the Kwinana site is licensed by the EPA to spray irrigate with waste water provided it contains less than 2500 ppm solids). Any runoff from spray irrigation or stormwater will end up back in the intercept pit.

Use

The notified polymer will be used in mineral processing applications where it will be added to the slurries during processing. Treated water will be discharged into tailings dams at the end of the process, from where it will be recycled back into the process. There is very little release expected during the mineral processing and no release should occur from the transport containers as these are dedicated and not washed in between uses. Spills have not been estimated by the notifier but will be

cleaned up with absorbent material and disposed to landfill. It may be likely that a further 0.1% of the product (< 150 kg/annum of the polymer) may be released in this way.

The notified polymer will remain with the treated slimes and will eventually breakdown into simple by-products. Releases to land of the notified polymer due to spills are contained in banded storage for the concentrated form. Spills from diluted form of notified polymer to land are unlikely due to control systems (solenoid) on make-up tank, banded areas and on-site pondage is sufficient to contain all waste generated waste streams containing the polymer. The notified polymer is not expected to be mobile and leach to groundwater.

The notified polymer has a strong flocculating ability due to its long linear chains of anionic copolymer. The notifier expects that the acrylamide groups in these chains to form hydrogen bonds with hydroxyl groups associated with the surface of finely divided particles and build flocs in the process. Anionic charge distributed along the polymer backbone will have charge attraction to solids and allow the polymer chain to fully extend (uncoil) to achieve maximum adsorption. Therefore, most of the released notified polymer in the waste stream is expected to be adsorbed to solids and removed via the sludge pits or the solids removal system at Kwinana or series of settling ponds at mineral processing minesites.

6.2. Summary of Occupational Exposure

Manufacturing site

Worker exposure to the notified polymer during manufacturing process is possible during opening and closing of container, mixing and pumping operations and during laboratory testing. Possible routes of exposure are via dermal, inhalation and eye contact. Concentration of the notified polymer in the liquid latex product is 28%.

End Use

Worker exposure to the notified polymer in mineral processing plant is possible during opening and closing of container, and transfer to the pond for dilution. Possible routes of exposure are via dermal, and eye contact.

Workers will use PPE, e.g. coverall, gloves, safety boots and safety goggles, conforming to Australian Standard.

6.3. Summary of Public Exposure

The notified polymer is intended only for use in industry. Therefore general public will not be exposed to the notified polymer.

7. PHYSICAL AND CHEMICAL PROPERTIES

Purity: > 98%

Data from the 28% polymer are as follows:

Appearance at 20°C and 101.3 kPa	Off white opaque emulsion with hydrocarbon odour
Melting Point/Glass Transition Temp	N/A
Autoignition Temperature	N/A
Density	1030 to 1060 kg/m ³ (product containing the notified polymer).
Water Solubility	Not quantified. The polymer contains functional groups that would be expected to give considerable water solubility.
Dissociation Constant	Not determined. The test substance contains strong acid groups which are expected to remain ionised throughout the environmental pH range of 4 to 9.
Explosive Properties	N/A
Reactivity	The polymer contains anionic charged groups.

**Degradation Products
Stability**

No degradation products expected
The notified polymer is not expected to degrade at environmental pH and temperature

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological data were submitted.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

9.1.1 Ecotoxicological Investigations

The following toxicological studies for the related Nalco 7877 (also known as C82A3 and ASP820), a product which contains a linear analogue polymer formed from the two major monomers plus other constituents such as surfactants, and P0117, which is 100% of the linear analogue copolymer, were submitted. The notified polymer (Nalco 98AUS047) was not used in any of the following toxicity tests, and these are accepted as appropriate surrogates for the proposed use.

For P0117 or Nalco 7877 (also known as C82A3 and ASP820) which are products containing the linear analogue polymer.

Fish toxicity

Turbot (*Scophthalmus maximus*)

Based on pure analogue polymer

96 hour LC50 > 1000 mg/L

Based on the analogue polymer containing surfactants

96 hour LC50 134 mg/L

Invertebrate toxicity

Marine copepod *Acartia tonsa*

Based on pure analogue polymer

48 hour LC50 400 mg/L (315–511 mg/L)

Sediment Re-worker toxicity

Corophium volutator

Based on the analogue polymer containing surfactants

10 day LC50 4966 mg/kg (dry weight)

Algal Toxicity

Skeletonema costatum

Based on pure analogue polymer

0 – 72 h EbC50 129 mg/L

0 – 72 h ErC50 172 mg/L

Based on the analogue polymer containing surfactants

0 – 72 h EbC50 1.9 mg/L

0 – 72 h ErC50 4.3 mg/L

9.1.2 Discussion of Observed Effects

FISH TOXICITY

Chemex International plc conducted a fish toxicity study (2001a). The fish toxicity study on C82A3 was conducted under semi-static conditions according to the standard operating procedure (SOP) E212 based upon OECD Guidelines for Testing of Chemicals Fish 203 modified to marine conditions.

Standardised artificial seawater with a salinity of 32-33 g/L based on sodium chloride was used in the study. Stock test solutions (containing 1000 mg/L either C82A3 or P0117) were prepared using the seawater. They were shaken vigorously and then left to stand for 1 hour. For each test concentration, a measured amount of the cloudy white homogenised stock solution was added to 12 litres of seawater

and mixed for 20-24 hours, after that the solution was allowed to settle and separate. The supernatant liquid was used for the test at concentrations of 100, 180, 320, 560 and 1000 mg/L. The pH (7.7-8.3), dissolved oxygen (67-100% of air saturation values, ASV) and temperature (14.0-15.5°C) of the test system were measured at time 0, 24, 48, 72 and 96 hours and a photoperiod of 16 light/8 hours dark was maintained. The test concentrations and control were replaced at 48 hours. The test concentrations were prepared as water accommodated fractions (WAF) and there was no determination of the actual concentration of the test solutions. Seven fish were placed in each test and the control vessels.

Concentrations of 320 mg/L and above were rapidly lethal to turbot and the LC50 and NOEC values after 96 hours were 134 and 100 mg/L WAF, respectively for C82A3 (analogue polymer containing additives). Due to the increasing toxicity with increasing WAF and the lack of measured concentrations, the results of this test are inconclusive. The toxicity of the test substance is likely to be lower than that at the loading rate as C82A3 was poorly soluble in water.

Chemex International plc conducted another fish toxicity study (2001b). Only a summary page was available for the toxicity testing of turbot to P0117 (pure analogue polymer). Identical test conditions appear to be employed. Based on the aquatic invertebrate toxicity test below, it is likely that P0177 is soluble in water. The LC50 was >1000 mg/L WAF after 96 hours.

AQUATIC INVERTEBRATE TOXICITY

Chemex Environmental International Limited conducted an invertebrate toxicity study (2002a). The invertebrate toxicity study was conducted according to the SOP E207 based upon ISO TC147/SC5/WG2 protocol by Thomson (1990).

A nominal 1000 mg/L solution containing P0117 was prepared in dilution water (natural sea water maintained at 15°C), shaken vigorously and allowed to stand for one hour. Test concentrations were prepared by the addition of specified quantities of the sample (a clear solution) to dilution water to obtain the required concentrations. A preliminary study had identified the 48 hour LC50 as being between 100 and 1000 mg/L and therefore a definitive test was conducted at 125, 250, 500, 1000 and 2000 mg/L. The reference substance, 3,5-dichlorophenol, was used at a concentration of 1 mg/L to confirm the test organism's sensitivity.

The pH, dissolved oxygen, temperature and salinity were measured immediately prior to initiating the test, and were measured on the dilution water at the end of the test. There was no determination of the actual concentration of the test solutions, but these may be assumed as having been close to nominal as all the polymer was dissolved.

The LC50 and NOEC values were 400 mg/L nominal at 48 hours (95% C.L 315-511 mg/L) and <125 mg/L nominal at 48 hours, respectively. ToxCalc version 5. Comprehensive Toxicity Data analysis and database Software, was used to estimate the results. Temperature stayed at 20°C, pH ranged from 7.6-7.9, dissolved oxygen ranged from 99-103% ASV and the salinity ranged from 35-37%. These variations are acceptable. There was 75% mortality in the reference substance indicating an acceptable level of sensitivity (ie 48 hour mortality range 20-80%).

It was concluded that the test substance is not considered harmful to marine aquatic invertebrate life.

AMPHIPOD SEDIMENT PHASE TOXICITY

Aquateam – Norwegian Water Technology Centre (1997) conducted a study. The sediment phase study was conducted according to the method detailed in Hyder Environmental SOP III.33, a procedure based on the protocol published by PARCOM (1995). Test species are the sediment reworker *Corophium volutator*, freshly dug from the North Wales coast. The exposure period was 10 days.

Artificial seawater with a salinity of 34.8 g/L was used. Weighed amounts of the test substance (ASP-820) were added to 10 g of dry sediment obtained from the site of collection of the amphipods, which was then added to the test vessel and mixed in 100 mL of seawater. Five concentrations of 1000.0, 1778.3, 3162.3 and 10000 mg/kg expressed on dry weight of sediment were tested, and twenty

organisms were used per test vessel. The artificial seawater overlying the sediment was maintained at a constant volume with the addition of purified water. The seawater was aerated constantly and abnormal behaviour and mortality observations were taken throughout the study period. Three replicates were done for each treatment and five for the control. Temperature, pH and dissolved oxygen were measured on Day 0, 1, 4, 7 and 10. At the end of the test the sediment was resuspended and sieved. Organisms that became opaque, were lying on the sediment surface, or exhibited no movement and failed to respond to tactile stimulus were recorded as mortalities. A probit analysis computer program from National Swedish Environmental Protection Agency was used to determine the LC50.

The 10 day LC50 was 4966.4 mg/kg dry weight of sediment (nominal). Observations were often difficult to make at 3162.3 mg/L and above due to poor visibility caused by suspended material in the water column. Deaths occurred at all concentrations, including 6 (of 60) in the controls, but the LOEC was determined as 1778.3 mg/kg based on >20% mortality compared with the control. Amphipods at all concentrations tested reached the surface within 10 minutes of being added to the test vessels. Dissolved oxygen readings ranged from 88-100% ASV, pH ranged from 7.63-8.07 and temperature ranged from 14-16°C. These variations are acceptable.

According to Mensink, (1995) the test substance is very slightly toxic to the marine amphipod *Corophium volutator*.

ALGAL GROWTH INHIBITION TEST

Chemex Environmental International Limited conducted tests on algae (2002b & c). The algal growth inhibition tests were carried out according to the SOP E209 based on ISO draft method (1991).

Seawater was used to prepare the test solution and the culture medium. Stock solutions of the test substances (either containing 1000 mg/L P0117 or C82A3, clear and cloudy white respectively) were prepared. The test concentrations were prepared by combining measured quantities of the stock solution with culture medium. After aspiration for 20-24 hours to obtain a homogeneous dispersion, these were allowed to settle and separate for 4 hours. The aqueous phase avoiding all settled and floating material was siphoned off and used in the study. Test concentrations were 63, 125, 250, 500 and 1000 mg/L (P0117) and 1.3, 2.5, 5.0, 10.0 and 20.0 mg/L (CA82A3). The test concentrations were prepared as WAF and there was no determination of the actual concentration of the test solutions. The pH was measured at the start and end of the study. The reference substance, 3,5-dichlorophenol, was used at a concentration of 1.5 mg/L to confirm the test organism's sensitivity.

The growth inhibition was calculated using both the biomass integral (ie the area under the growth curve) and the growth rate method. The EC50 was estimated by either a linear logarithm or logarithm-probit plot of concentration verses percentage growth inhibition. After 72 hours the EbC50 and ErC50 values were 129 and 172 mg/L WAF, respectively for solutions containing P0117, and the EbC50 and ErC50 values were 1.9 and 4.3 mg/L WAF, respectively for solutions containing C82A3. The pH ranged from 7.8-8.9. This variation was acceptable. The cell density in the control during the study increased by a factor of 100. In the reference substance test, there was a 44 % inhibition of growth rate, which indicated there was an acceptable level of sensitivity (ie it was in the range 20-80%). For tests with C82A3, it is noted that at lower concentrations (1.3-5.0 mg/L) inhibition was lower after 72 than at 48 hours, indicating some recovery.

While the product C82A3 is clearly far more toxic to marine algae than the pure analogue polymer (P0117), the reason for this is unclear. This may be due to other constituents present, for example surfactants. It may be concluded that due to the use of WAF and the lack of measured concentrations the results of this test are inconclusive with regard to the toxicity of the test substance C82A3 due to lack of solubility, whereas there was no undissolved material for P0117.

9.2. Environmental Hazard Assessment

The closest analogue to the notified polymer (P0117) shows some toxicity towards marine algae (72 h EbC50 and ErC50 values were 129 and 172 mg/L), but very little towards marine fish and aquatic invertebrates (96 h LC50 > 1000 mg/L and 48 h EC50 = 400 mg/L, respectively). The other analogue

(C82A3) shows moderate toxicity towards marine algae (72 h EbC50 and ErC50 values are 1.9 and 4.3 mg/L WAF), and practically no toxicity towards marine fish (96 h LC50 = 134 mg/L) and the sediment reworker (10 day LC50 was 4966.4 mg/kg dry weight of sediment), with no toxicity tests conducted towards aquatic invertebrates. It appears that the other components present (for example the surfactants) in the analogue polymer product (C82A3) substantially increase the toxicity towards algae and fish, while almost no toxicity was observed towards the sediment reworker

How this relates to the product 98AUS047 containing the notified polymer is unclear, though it is noted from the MSDS this product contains 10-30% C10-C16 petroleum hydrocarbons and 1-5% ethoxylated C12-C15 alcohol. The test results are also only for marine organisms, though ECETOC (2003) concludes that freshwater organisms are likely to be more sensitive than marine species.

As results are available to 3 trophic levels, Predicted No Effect Concentrations (PNECs), based on the analogue polymer and its product, may be derived by dividing the most sensitive result by 100. The PNECs are 1.29 mg/L and 19 µg/L respectively.

10. RISK ASSESSMENT

10.1. Environment

The notified polymer will be manufactured in Australia and used in mineral sands mines as a flocculant to aid in the solid/liquid separation of water from fine silts and clays. Very little waste containing the notified polymer will be generated during the manufacture (up to 150 kg/annum). This waste will be disposed of to an on site interceptor pit and supernatant of the waste water will be used to spray irrigate the site lawns. Although a small amount may leach a short distance due to its miscibility in water, it should soon become immobile within the sediments due to its high molecular weight and expected adsorption to the soil. Once bound to the sediments, it will gradually decompose through the biotic and abiotic processes occurring in these sites to simple nitrogen, sulphur and carbon compounds.

All of the notified polymer would eventually be released into the environment. The polymer will be released to the tailings dams during the mineral processing applications and should remain in the dam either in the water compartment until recycled back into the process or slowly adsorbed to the soil and sediments of the dam as the polymer gradually drops out of solution. The polymer should gradually sediment out through complexation with calcium salts and/or flocculation.

Once adsorbed to the sludge or soil particles, the polymer is not expected to be available for further environmental interaction. The notifier does not expect the product containing the notified polymer to readily biodegrade, however, the notified polymer is expected to eventually degrade due to slow abiotic processes. Further, the high molecular weight and water solubility indicate a low potential to bioaccumulate.

The notifier has provided a typical scenario for a mineral processing site. The dilute polymer (0.01% solution) is added to the dredge pond (volume 500 ML). Flow rates to this pond are 400 m³/h of 5-7% slimes, which are treated with approximately 200 g polymer/tonne dry solids, equating to a usage of 5 kg/hour of the notified polymer. Therefore the concentration of the polymer entering the pond is:

$$\begin{aligned} & 5 \text{ kg} / 400,000 \text{ L} \\ & = 5 \times 10^6 \text{ mg} / 400,000 \text{ L} \\ & = 12.5 \text{ mg/L} \end{aligned}$$

The overflow of treated slimes from the dredge pond is pumped into a series of settling ponds (volumes between 40-80 ML) to allow clarification processes to be completed. In an extreme worst case assuming use of the notified polymer from the start of mining, and no losses in the dredge pond, the concentration of the notified polymer in the overflow is 12.5 mg/L, which would not be further diluted in the settling ponds (assuming these ponds were empty at the start of mining). However, much of the notified polymer is expected to adsorb to sediment and assuming at equilibrium this is an average of 90% (taking into account that flow of the polymer into the dredge and settling will be continuous processes), this would reduce the PEC to 1.25 mg/L.

The risk quotient RQ or PEC/PNEC based on the analogue polymer is just below 1 (ie $1.25/1.29 = 0.97$), but it is well over 1 (ie 65.8) based on the analogue polymer product C82A3. However, the effect and fate of the petroleum hydrocarbons present in 98AUS047 is not clear (though they would be expected to float on the surface and gradually evaporate), as well as the surfactant (which may, at least partially, adsorb to the minerals present).

The above rather preliminary calculations underline the importance of keeping the notified polymer from entering natural waterways. Note that the notifier expects the mineral processing sites to be many kilometres from natural waterbodies, and that all pondage will be contained within the mine site with no direct connection to any natural waterways. Groundwater is also said to be typically located well below the mineral processing mine sites.

Although the use of the notified polymer will be used in a limited number of locations within Australia, based on the above worst-case risk analysis it is unlikely that the notified polymer would exist at levels which could pose a threat to aquatic organisms, as long as all pondage is contained within the mine site.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low. The notified polymer is present in formulations containing hazardous ingredients. If these formulations 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.

Worker exposure to the notified polymer during transport and storage is only possible in the event of an accidental spillage.

10.3. Public health

As there will be no expected exposure of the public to the notified polymer, the health risk to the public from exposure to the notified polymer is considered negligible.

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

11.1. Environmental risk assessment

The polymer is not considered to pose a risk to the environment based on its reported use pattern, and all pondage will be contained within the mine site with no release to any natural waterways.

11.2. Human health risk assessment

11.2.1. Occupational health and safety

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

11.2.2 Public health

There is Negligible Concern to public health when used in the proposed manner.

12. MATERIAL SAFETY DATA SHEET

Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation.
 - 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 polymer 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

Disposal

- The wastes containing the notified polymer should be disposed of in an approved incinerator or waste treatment/disposal site in accordance with all applicable regulations.
- The wastes should not be disposed of in sewer or with normal garbage.
- Empty containers should be triple rinsed (or equivalent), with the rinsate added to the slimes being treated, and the containers offered for recycling or reconditioning, or they should be punctured and disposed of in a sanitary landfill or by other procedures approved by state and local authorities.

Emergency procedures

- The product should be prevented from entering natural waterways or sewers.
- For small spills soak up with absorbent material and place in suitable, covered and properly labelled containers. Wash affected area.
- For large spills, soak up as thoroughly as possible with inert absorbent material or sawdust. Do not wash the affected area until all possible traces are removed as water in contact with the product will create a voluminous and slippery gel.
- Dispose the contaminated recovered material via an approved waste hauler and in accordance with the disposal considerations.

13.1. 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 subsection 64(1) of the Act; if
 - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

- a more significant release to water such as the sewer or natural water bodies is likely to occur. Provision of freshwater aquatic toxicity data of the notified polymer rather than those currently available for a surrogate for marine species will be required.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

14. BIBLIOGRAPHY

Aquateam – Norwegian Water Technology Centre (1997). Sediment Phase Toxicity Test Result with *Corophium volutator* for the test substance ASP-820. Report Number: 97-094. Norway (Unpublished).

Chemex International plc (2001a) The toxicity to Turbot (*Scophthalmus maximus*) of C82A3. Report for Nalco/Exxon Energy Chemicals Ltd. Chemex reference : ENV5664/080116. Cambridge. England (Unpublished).

Chemex International plc (2001b) The toxicity to Turbot (*Scophthalmus maximus*) of P0117. Chemex reference : ENV5877/080112. Cambridge. England (summary only, Unpublished).

Chemex Environmental International Limited (2002a). The toxicity to *Acartia tonsa* of P0117. Report for ONDEO Nalco Energy Services Limited. Chemex reference : ENV5876/080112. Cambridge. England (Unpublished).

Chemex Environmental International Limited (2002b). The growth inhibition of the marine alga *Skeletonema costatum* by C82A3. Report for ONDEO Nalco Energy Services Limited. Chemex reference: ENV5925/080116. Cambridge. England (Unpublished).

Chemex Environmental International Limited (2002c). The growth inhibition of the marine alga *Skeletonema costatum* by P0117. Report for ONDEO Nalco Energy Services Limited. Chemex reference: ENV5875/080112. Cambridge. England (Unpublished).

ECEOTC (2003). Technical Report No 91, Aquatic Hazard Assessment II, European Centre for Ecotoxicology and Toxicology of Chemicals, Brussels

Mensink BJWG. Montforts M, Wijkhuizen-Maslankiewicz L, Tibosch H. and Linders JBHJ (1995) Manual for summarising and evaluating the environmental aspects of pesticides. National Institute of Public Health and Environmental Protection, Bilthoven, The Netherlands. Report No. 679101022.

PARCOM (1995) A Sediment bioassay using an amphipod *Corophium sp.* Oslo and Paris Commission Protocol.

Thompson, RS (1990). Water quality determination of acute lethal toxicity of marine copepods (Copepoda, Crustacea) United Kingdom proposal to ISO TC147/SC5/WG2, second draft November 1990.