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August 2006

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

**FULL PUBLIC REPORT**

**Polymer in Salt RW 1**

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.

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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:	<a href="http://www.nicnas.gov.au">www.nicnas.gov.au</a>

**Director  
NICNAS**

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**FULL PUBLIC REPORT****Polymer in Salt RW 1****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Hewlett Packard Australia Pty Ltd (ABN: 74 004 394 763) of 3 Richardson Place North Ryde NSW 2113

## NOTIFICATION CATEGORY

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 and Structural Formulae, Molecular Weight, Spectral Data, Polymer Constituents, Residual Monomers/Impurities, Purity, Identity of Additive/Adjuvants, Percentage of Additive/Adjuvants, Manufacture/Import Volume, and Site of Manufacture/Reformulation.

## 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)

None

## NOTIFICATION IN OTHER COUNTRIES

None

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

Polymer Salt RW 1

**3. PLC CRITERIA JUSTIFICATION**

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

**4. PHYSICAL AND CHEMICAL PROPERTIES****Appearance at 20°C and 101.3 kPa**

Liquid (never isolated from solutions)

**Melting Point/Glass Transition Temp**

Not applicable

**Specific Gravity**

1.15

<b>Water Solubility</b>	> 150 g/L
<b>Dissociation Constant</b>	pKa = approximately 4 (calculation by ACD software)
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Degradation Products</b>	None under normal conditions of use

## 5. 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>	< 0.5	< 1.0	< 1.5	< 1.5	< 1.5

### USE AND MODE OF INTRODUCTION AND DISPOSAL

#### Mode of Introduction

The notified polymer will be imported as a component of inkjet printing inks in pre-packed cartridges. The volume of the ink cartridges will be 28 mL, 69 mL, 130 mL and 775 mL. The inks will contain a maximum of 2% notified polymer.

#### Reformulation/manufacture processes

No manufacture or reformulation of the notified polymer occurs in Australia. The notified polymer is imported as a component in an ink in a sealed inkjet cartridge. The sealed inkjet cartridge is delivered to the end-user in its original packaging.

#### Use

The sealed inkjet containing the notified polymer are used in different types of printers designed for both commercial and public purposes.

## 6. HUMAN HEALTH IMPLICATIONS

### 6.1. Exposure Assessment

#### OCCUPATIONAL EXPOSURE

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

Dermal and inhalation exposure (at a maximum concentration of 2%) of worker to the notified polymer will potentially occur when replacing spent cartridges and clearing paper jams from the printers. However, the concentration of the notified polymer in the toner is low, and the design of the cartridges is such that exposure to the notified polymer would be limited to a very small amount of dermal and inhalation exposure.

Users of the printers may also be exposed to the notified polymer during handling of printed paper, however, the notified polymer is bound to the paper matrix and not expected to be readily bioavailable except if the paper or other substrate is handled before the ink has dried.

#### PUBLIC EXPOSURE

The sealed ink cartridge containing the notified polymer will be used in printing kiosks at the shopping malls. The public could be exposed from use of the kiosks if they handle the prints before they are adequately dry. However, the risk to public health will be negligible because the notified polymer is present at low concentrations and unlikely to be bioavailable, once incorporated into a printed image.

## 6.2. Toxicological Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

The notified polymer contains three hazardous residual monomers to which dermal and inhalation exposure could occur. However, the concentrations of the hazardous residual monomers in the inks are less than cut-off levels.

## 6.3. Human Health Risk Assessment

### OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is expected to be low, based on the minimal exposure to workers and the low intrinsic hazard of the polymer. The presence of hazardous residual monomers is not considered to present a risk to workers due to the low concentration in the ink.

### PUBLIC HEALTH

The notified polymer will not be available to the public. Members of the public may make dermal contact with the ink containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is predicted to be of low hazard, present at low concentrations in the ink and is unlikely to be bioavailable once the ink has dried.

## 7. ENVIRONMENTAL IMPLICATIONS

### ENVIRONMENTAL RELEASE

#### Release of Chemical at Site

No release is expected because reformulation of the ink containing the notified polymer will not take place in Australia.

#### Release of Chemical from Use

Release of the ink solution to the environment is not expected under normal use because the cartridges are designed to prevent leakage. If leakage or accidental spills occur, the ink (including the notified polymer) is expected to be contained using absorbent material and then presumably disposed of to landfill.

Empty cartridges will be recycled at a Hewlett Packard recycling centre in Australia. The cartridges will be crushed and the various parts recycled. Any ink residues, estimated to be less than 10%, will be separated from the cartridge and incinerated.

The treated paper will either be disposed of to landfill or it may be recycled. As a result of the recycling process, the notified polymer will either become incorporated in the resultant sludge or released in the effluent to municipal sewers, then ultimately to the aquatic environment at low levels.

### ENVIRONMENTAL FATE

The relatively large molecular weight and the water solubility of the notified polymer indicates it will not readily cross biological membranes, and a low potential for bioaccumulation is predicted. If disposed of by incineration, the notified polymer is expected to be thermally decomposed to form simple salts, water and oxides of carbon.

In the paper recycling process, most of the notified polymer present, as part of the ink matrix, is likely to be destroyed or become part of the resultant sludge, which goes to landfill. Some may go to sewer in the effluent and subsequently to the aquatic compartment where the notified polymer may either remain in the water column or become associated with organic matter or the sediments.

The notified polymer that is disposed of to landfill, either due to spills/leaks, treated paper disposal or sludge disposal, is expected to associate with soil and organic material and should be immobile within the landfill environment. Over time, the notified polymer and ink matrix are expected to degrade by biotic and abiotic means to form simple organic compounds.

## 7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This could apply to the notified polymer. However, the toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

## 7.3. Environmental Risk Assessment

The environmental safety controls and use pattern for the notified polymer would indicate a limited potential for release into the environment.

The notified polymer is soluble in water, however, aquatic release is considered unlikely when in the cartridge. After use the notified polymer is likely to be stable within an inert matrix on printed paper products. Waste paper may be disposed of directly to landfill with the notified polymer strongly bound to the paper. In a landfill, the notified polymer is expected to be immobile, and eventually it will degrade through biotic and abiotic processes. Incineration of waste paper will destroy the compound with the generation of water vapour and oxides of carbon, nitrogen and sulphur.

Emptied ink cartridges containing a residue of the notified polymer will be recycled. Consequently, there should not be significant exposure of the environment to the notified polymer.

Recycling of treated paper may take place with the disposal of the ink/notified polymer in the resultant sludge to landfill and some may go to sewer and then into the aquatic environment. Since the initial concentration of the notified polymer on the paper is low, and that the paper recycling centres are located throughout Australia, the release of the notified polymer to the aquatic environment will be at low levels and in a diffuse manner.

No ecotoxicity data are available, however, based on the exposure levels and use pattern, the notified polymer is unlikely to pose an unacceptable risk to the environment.

## 8. CONCLUSIONS

### 8.1. Level of Concern for Occupational Health and Safety

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

### 8.2. Level of Concern for Public Health

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

### 8.3. Level of Concern for the Environment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

## 9. MATERIAL SAFETY DATA SHEET

### 9.1. Material Safety Data Sheet

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

## 10. 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.
- A revised product MSDS with an Emergency Telephone Number in Australia need to be provided to NICNAS.
- 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 notified polymer should be disposed of to landfill or via incineration, where available.

Emergency procedures

- Spills/release of the notified chemical should be physically contained, the slowly vacuumed or swept into a bag or other sealable container. Dispose of in compliance with federal, state and local regulations.

#### **10.1. 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.

or

- (2) Under subsection 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.