

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

### POLYMER OF LOW CONCERN PUBLIC REPORT

#### Polymer in Polystabil KWS

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Australian Government Department of the Environment.

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:

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**Director  
NICNAS**

June 2014

### Table of Contents

SUMMARY .....	2
CONCLUSIONS AND REGULATORY OBLIGATIONS.....	2
ASSESSMENT DETAILS.....	3
1. APPLICANT AND NOTIFICATION DETAILS.....	3
2. IDENTITY OF POLYMER .....	3
3. PLC CRITERIA JUSTIFICATION .....	3
4. PHYSICAL AND CHEMICAL PROPERTIES.....	4
5. INTRODUCTION AND USE INFORMATION .....	4
6. HUMAN HEALTH RISK ASSESSMENT.....	4
7. ENVIRONMENTAL RISK ASSESSMENT .....	5

## SUMMARY

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

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1196	Ashland Hercules Water Technologies (Australia) Pty Ltd	Polymer in Polystabil KWS	No	≤ 120 tonnes per annum	Scale inhibitor in sugar processing

## CONCLUSIONS AND REGULATORY OBLIGATIONS

### Human Health Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

### Environmental Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

### Health and Safety Recommendations

- 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 (M)SDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer 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 polymer should be disposed of to landfill.

### Emergency Procedures

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

### 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 polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these

circumstances change. These obligations apply even when the notified polymer 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
- the notified polymer is introduced in a chemical form that does not meet the PLC criteria.
- or
- (2) Under Section 64(2) of the Act; if
- the function or use of the notified polymer has changed from a scale inhibitor in sugar processing, or is likely to change significantly;
  - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
  - the notified polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the notified polymer 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 product containing the notified polymer was provided by the applicant. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

### **ASSESSMENT DETAILS**

#### **1. APPLICANT AND NOTIFICATION DETAILS**

##### **Applicant**

Ashland Hercules Water Technologies (Australia) Pty Ltd (ABN: 97 001 584 523)  
7 Sir Thomas Mitchell Road  
Chester Hill NSW 2162

##### **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, polymer constituents, residual monomers and import volume.

#### **2. IDENTITY OF POLYMER**

##### **Marketing Name(s)**

Polystabil KWS (product containing the notified polymer)

##### **Molecular Weight**

Number Average Molecular Weight (Mn) is > 1,000 Da

#### **3. PLC CRITERIA JUSTIFICATION**

##### *Criterion*

Molecular Weight Requirements

Functional Group Equivalent Weight (FGEW) Requirements

##### *Criterion met*

Yes

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	Colourless to yellowish clear liquid (product)
Melting Point/Glass Transition Temp	-5 °C (MSDS)
Density	1.2 kg/m <sup>3</sup> at 20°C
Water Solubility	>400 g/L at 20°C (commercial product contains 40% polymer dissolved in water). Study report not provided. Expected to be water soluble based on the presence of hydrophilic functional groups in the chemical structure and use in aqueous systems.
Dissociation Constant	The notified polymer is a salt and is expected to be ionised under normal environmental conditions (pH 4 – 9)
Particle Size	Imported in solution
Reactivity	Stable under normal use conditions
Degradation Products	Not known

#### 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>
Tonnes	≤ 120	≤ 120	≤ 120	≤ 120	≤ 120

##### Use

The notified polymer will be imported as a 40% aqueous solution for use as a scale inhibitor in sugar processing. It will be dosed at up to 20 ppm at the front end of the sugar mill. The notified polymer will remain in the mother liquor from the raw sugar crystallisation process. It will separate with the molasses which is mainly used in fermentation to produce ethanol. During this use, the polymer will end up in the distillation bottoms which are then either incinerated or disposed of to landfill. The molasses may also be used as a feed supplement for livestock. It is estimated by the notifier that the level of notified polymer in molasses is likely to be < 20 ppm.

The raw sugar will not be used as a food source, but will progress to a separate sugar refining process. The notified polymer will be completely removed from the sugar during refinement, therefore no exposure of the public is expected.

#### 6. HUMAN HEALTH RISK ASSESSMENT

The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard. This is supported by a test submitted on the product containing the notified polymer at 40% for the following toxicological endpoint:

<i>Endpoint</i>	<i>Result</i>	<i>Effects Observed?</i>	<i>Test Guideline</i>
Mouse, acute oral	LD50 > 5000 mg/kg bw	no	OECD TG 401

The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

Although not considered in this risk assessment, NICNAS notes that the notified polymer contains residual monomers that are classified as hazardous according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia. These are not present in the notified polymer as introduced above the cut off concentrations for classification.

## **7. ENVIRONMENTAL RISK ASSESSMENT**

No ecotoxicological data were submitted. Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This may apply to the notified polymer. However, the toxicity to algae is likely to be reduced due to the presence of calcium ions in the aquatic compartment which will bind to the acid functional groups.

The notified polymer will be imported as a finished end-use product and will not be reformulated in Australia. The notified polymer will be used as a scale inhibitor in sugar processing. Spills contained in adsorbent material and residues are expected to be disposed of to landfill. The notified polymer in washings is expected to be disposed of to soil or landfill. The majority of the notified polymer will end up in the molasses, the by-product of the sugar processing, which will be used either as animal feed additive or may be used in the production of ethanol. In the former case, the notified polymer is expected to be released to soil within animal faeces. In the latter case, the notified polymer is likely to remain in the distillation residues, probably in a decomposed state. The residues from distillation are expected to be disposed of to landfill. The notified polymer is not expected to be released to sewer or natural waterways from use.

The notified polymer is expected to be soluble in water. However, it is also not expected to cross biological membranes due to its high molecular weight and thus, it is not expected to bioaccumulate. In landfill, the notified polymer is expected to eventually degrade via abiotic and biotic pathways to form water and oxides of carbon.

Therefore, based on its assumed low hazard and assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.