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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer 2 in S-10136 and MAX HT 500 Bayer Process Scale Inhibitor

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, Water, Heritage and the Arts.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full 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

TABLE OF CONTENTS

FULL PUBLIC REPORT

Polymer 2 in S-10136 and MAX HT 500 Bayer Process Scale Inhibitor

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Cytec Australia Holdings Pty Ltd (ABN 45 081 148 629)
Suite 1, Level 1 Norwest Quay
21 Solent Circuit
Norwest Business Park
Baulkham Hills NSW 2153

NOTIFICATION CATEGORY
Limited: Synthetic polymer with Mn ≥ 1000 Da.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: Chemical Name, Other name, CAS Number, Structural formula, Means of identification, Molecular weight, Polymer constituents, Residual monomers, Import volume, Purity, Import Volume and Concentration of the imported notified polymer and concentration of notified polymer in end-use.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation (including justification) to the schedule of data requirements is claimed as follows: Melting point/Boiling point, Vapour pressure, Hydrolysis as a function of pH, Partition co-efficient, Absoprtion/desoprtion, Dissociation constant, Flash point, and Autoignition temperature.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
S-10136 (product containing the notified polymer)
MAX HT™ 500 Bayer Process Scale Inhibitor (product containing the notified polymer)

ANALYTICAL DATA
Reference NMR, IR, GPC, UV spectra were provided.

3. COMPOSITION

DEGREE OF PURITY >90%

ADDITIVES/ADJUVANTS None.

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES
None.

DEGRADATION PRODUCTS
None.

4. PHYSICAL AND CHEMICAL PROPERTIES

Unless otherwise stated, the properties below are for the product S-10136 containing the notified polymer in an aqueous solution at a concentration less than 25%.

APPEARANCE AT 20ºC AND 101.3 kPa: Off-white to light yellow viscous liquid.

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined.	The solution freezes at -15ºC.
Boiling Point	Not determined	Expected to be approximately 100ºC (based on the presence of water).
Vapour Pressure	Approximately 18 mm Hg at 20ºC (based on the presence of water)	Estimated. Due to the high molecular weight of the polymer, the vapour pressure of the notified polymer is expected to be negligible.
Density	1000–1050 kg/m^3 at 20ºC	Estimated/MSDS.
Water Solubility	0.96% at pH 7. Completely soluble at pH >9.	Measured.
Hydrolysis as a Function of pH	Not determined	Based on its structure, the notified polymer is not expected to readily hydrolyse.
Partition Coefficient (n-octanol/water)	Not determined	Based on its water solubility, the notified polymer is expected to largely partition to water. However, the level of partitioning will vary with pH.
Adsorption/Desorption	Not determined	Based on functionalities present, the notified polymer is expected to adsorb strongly to organic matter and minerals.
Dissociation Constant	Not determined	The notified polymer has both acidic and basic functionalities which would be expected to exhibit typical dissociative behaviour.
Particle Size	Not applicable	The notified chemical is in liquid form and never isolated.
Flash Point	Not determined	It is present in aqueous solution.
Autoignition Temperature	Not determined	It is present in aqueous solution.
Explosive Properties	Not determined	Not expected to be explosive, on the basis of structure.

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

Reactivity
The notified chemical is expected to be stable under normal condition of use. Materials to avoid: acids & oxidising agents. The notified polymer crosslinks at pH less than 9.

Dangerous Goods classification
Based on the available data the notified polymer is not classified as a Dangerous Goods according to the Australian Dangerous Goods Code (FORS, 1998):

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will be imported either as a manufacturing concentrate (S-10136) or as a ready-to-use product (MAX HT™ 500 Bayer Process Scale inhibitor). The manufacturing concentrate may be used (diluted) to formulate the commercial product in Australia. Both products containing the notified polymer will be imported in Intermediate Bulk Containers (IBCs), which holds 1000 L of the product.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	30-100	30-100	100-300	100-300	100-300

PORT OF ENTRY
SYDNEY

IDENTITY OF MANUFACTURER/RECIPIENTS
Aluminium processing industry.

TRANSPORTATION AND PACKAGING
The notified polymer will be imported either as a manufacturing concentrate (S-10136) or as a ready-to-use product (MAX HT™ 500 Bayer Process Scale inhibitor) in 1000 kg IBCs. The notified polymer will be transported from the wharf to Cytec Australia Holdings warehouse by truck where it will be stored before being distributed to customers for repackaging (this applies to MAX HT™ 500 Bayer Process Scale Inhibitor) or reformulation (this applies to S-10136). After reformulation and repackaging (typically in isotainers), the end-use product is transported by road to the mining industry.

USE
Scale inhibitor in processing of aluminium ore. It is used in the Bayer process for obtaining alumina from the aluminium ore (bauxite).

OPERATION DESCRIPTION
Importation of S-10136 and MAX HT™ 500 Bayer Process Scale Inhibitor
S-10136 and MAX HT™ 500 Bayer Process Scale Inhibitor will be imported in 1000 kg IBCs as an aqueous solution at a concentration of <25% and < 10%, respectively. These products will be transported by trucks from the wharf to Cytec Australia Holdings warehouse and stored before being distributed to customers for reformulation and repackaging.

Reformulation of S-10136
S-10136 containing the notified polymer will be imported as a manufacturing concentrate in an aqueous solution at a concentration of <25% and blended into more dilute solutions in Australia by a toll manufacturer.

At the local blending site, S-10136 product is received in 1000 kg IBCs and stored in a bunded, dedicated Dangerous Goods Area. When required, the S-10136 is transferred on a pallet by forklift from the stored area to the blending area. S-10136 is pumped using an automated pumping system into a 20,000L isotainer and quality control samples may be taken during the blending process from isotainer via a valve. The blending vessels are sealed at all times during the blending of a batch except during the charging of the vessels. Once the blending process is completed, the 20,000L isotainer containing the finished product is closed and transported by road to the customer site for use. Blending will take approximately two hours, and will not require the use of heat. The concentration of the notified polymer in the finished product will be less than 10%.

Repackaging of MAX HT™ 500 Bayer Process Scale Inhibitor
MAX HT™ 500 Bayer Process Scale inhibitor containing the notified polymer will be imported as an aqueous solution at a concentration of <10% and repackaged in Australia by a toll manufacturer.

At the local blending site, the MAX HT™ 500 Bayer Process Scale Inhibitor is received in 1000 kg IBCs and stored in a bunded, dedicated Dangerous Goods Area. When required, the MAX HT™ 500 Bayer Process Scale Inhibitor is transferred on a pallet by forklift from the stored area to the repackaging area. MAX HT™ 500 Bayer Process Scale Inhibitor is pumped using an automated pumping system into a 20,000L isotainer. Once the repackaging process is completed, the 20,000L isotainer containing the product is closed of and transported by road to the customer site for use. Repackaging will take approximately 1.5 hours and will not require the use of heat. The concentration of the notified polymer in the repackaged product does not change and is less than 10%.

End-use operations-aluminium ore processing site
At the end-users site, the product containing the notified polymer (<10%) will be used as a scale inhibitor in the

Bayer Process. The Bayer Process is a procedure for obtaining alumina from the aluminium ore (bauxite). Bauxite contains only 30-54% alumina, the rest being a mixture of silica, various iron oxides, and titanium dioxide. The alumina must be purified before it can be refined to aluminium metal. The Bayer Process is a closed loop system and discharge to the environment is negligible. The Bayer Process suffers from problems with solid deposits (scaling) on heat exchangers and in pipes, which results in poor heat transfer and reduced working volume in parts of the process plant and ultimately resulting in loss in both production and hazardous working conditions for manpower descaling the equipment.

In the Bayer Process, the product (containing the notified polymer) is pumped to the Bayer liquor, feeding either the evaporators or digester heaters. When added to the evaporators, product (containing the notified polymer) will live through the evaporators and will still be effective in the digester heaters. The product containing the notified polymer completely eliminates sodalite scale accumulation in liquor heat exchangers and inter-stage piping.

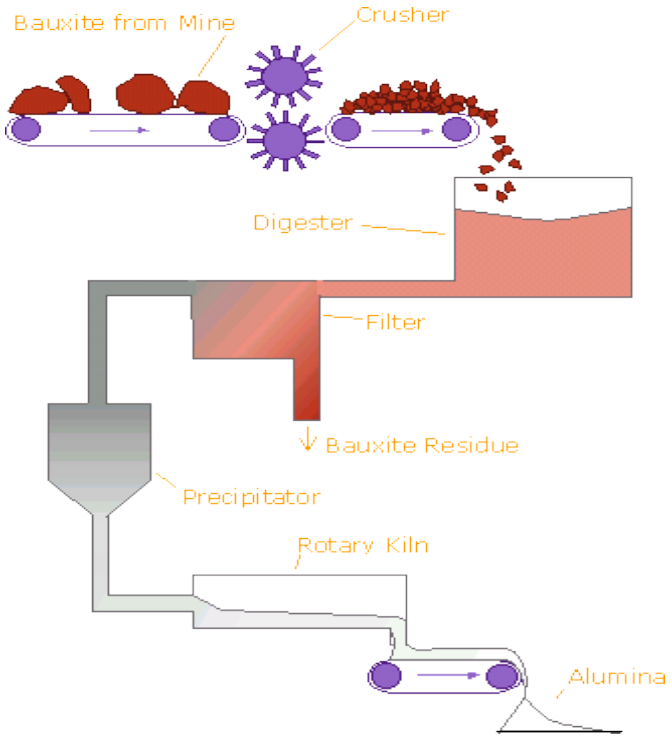
During the digestion process, bauxite is washed with a hot solution of sodium hydroxide at 175°C. This converts the alumina to aluminium hydroxide, which is dissolves in the hydroxide solution. During the clarification process, the liquor containing the alumina is separated from the insoluble impurities (undissolved bauxite residues, containing iron, silicon and titanium) that were part of the original bauxite. These residues, known as 'red mud' sink gradually to the bottom of the tank and are removed. The notified polymer is expected to end up in the red mud, and does not build up in the circuit.

During the precipitation phase, the alumina is precipitated or crystallised from the solution as crystals of alumina trihydrate. During this phase, the solution is mixed in tall vessels with recycled seed crystals. When completed, the solid alumina trihydrate is passed on to the next stage and the remaining liquor, which contains the sodium hydroxide, the product (containing the notified polymer) and some alumina, goes back to the digesters.

In the final stages (calcination), the alumina trihydrate is washed to remove any remaining sodium hydroxide. It is then heated to about 1050°C in special kilns to drive off the water of crystallisation, leaving the alumina. The caustic soda is returned to the start of the process and used again. The fate of the notified polymer in the red mud is discussed later.

The flow in a Bayer Plant ranges from 500 cubic meters/hr for a small plant to 2500 cubic meters/hr for a large plant. The dose of MAX HT™ 500 Bayer Process Scale inhibitor is expected to be <10 ppm (as sold). Therefore, the amount of notified polymer used in the Bayer Process would be <1 ppm as notified polymer, depending on the size of the plant. The product is not sensitive to water quality and any easily accessible water stream may be used for the purpose of dilution.

The Bayer Process



6. HUMAN HEALTH IMPLICATIONS

6.1 Exposure assessment

6.1.1 Occupational exposure

NUMBER AND CATEGORY OF WORKERS

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
Waterside and Transport	3-6	2-3 hours/day	10-15 days/year
Warehouse	2-3	2-3 hours/day	10-15 days/year
At blending/repackaging site			
Blending	2	8	25 days/year
Quality control	1	0.75	25 days/year
Repackaging	2	8	25 days/year
End-users: Mining Industry			
Plant operators	6-12	1-8 hours/day	300 days/year

EXPOSURE DETAILS

Storage and transportation

Transport and distribution workers are not expected to be exposed to the notified chemical except in the unlikely event of accidental spillage. In case of such accidental exposure, main routes of exposure would be dermal and ocular. However, the likelihood of such an accidental exposure is expected to be minimal.

Blending of S-10136

Manufacturing areas are equipped with general and local exhaust ventilation. Blending workers will wear chemical resistant overalls, chemical resistant gloves, and safety glasses/face shield and safety shoes. Laboratory staff undertaking the QC activities wears lab coats, chemical resistance gloves and safety glasses. Dermal and ocular exposure to the notified polymer (at a concentration <25%) may occur as result of drips and spills during the sampling process and also during the connection/disconnection of pumps. However, worker exposure is expected to be low due to automated systems and wearing of personal protective equipment (PPE).

Repackaging of MAX HT™ 500 Bayer Process Scale Inhibitor

Repackaging areas are equipped with general and local exhaust ventilation. Repackaging workers will wear chemical resistant overalls, chemical resistant gloves, and safety glasses/face shield and safety shoes. Therefore, inhalation, dermal and ocular exposure to the notified polymer (at a concentration <10%) as result of drips and spills and during the connection/disconnection of pumps is expected to be low.

End-user site application-aluminium ore processing site

During the end-use operations, workers are only exposed to notified polymer (at a concentration <10%), when connecting/disconnecting pipes to isotankers, transferring the product to holding tanks and when replacing the empty IBCs with the new IBCs. Considering that the end-use operations are highly automatic and that worker wears PPE during these operations, dermal and ocular exposure is expected to be low. Furthermore, the polymer is dosed into the ore being processed at a very low level (<1 ppm). Therefore, no significant worker exposure is expected through contact with the treated ore.

Any residue remaining in IBC or isotankers are poured into the next IBC to be used. This activity occurs daily and takes approximately 5-10 minutes under normal conditions. Dermal and ocular exposure may occur during this activity, as a result of spills and drips. Workers involved in the process will wear gloves, overalls and safety glasses. Therefore, exposure is expected to be low.

Cleaning of pump and transfer lines and maintenance work on the equipment used to dispense the liquid containing the notified polymer is rarely required. Personnel undertaking maintenance tasks are required to wear gloves, overalls, safety glasses and a respirator if necessary. Therefore, exposure is expected to be low during cleaning and maintenance work.

The polymer is imported and used in an alkaline product with corrosive properties. The controls in place to limit exposure to this hazardous product would also limit exposure to the notified polymer.

6.1.2. Public exposure

The notified polymer is intended only for use in industry. Therefore, the public is unlikely to be exposed to the notified polymer during transport, storage, and manufacture except in the event of an accidental spillage.

6.2. Human health effects assessment

The notifier has not submitted any toxicology studies on the notified polymer. Although the notified polymer contains a group that may be irritant or sensitising, the molecular weight is high and the low molecular weight species were negligible. Therefore, the notified polymer is considered unlikely to have any health effects. Furthermore, systemic toxicity is also unlikely as polymers with a number average molecular weight of greater than 1000 are poorly absorbed across biological membranes.

Classification

As data is not available, the notified polymer cannot be classified under the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human health risk characterisation

6.3.1. Occupational health and safety

No toxicity data were submitted for the notified polymer, therefore the notified polymer cannot be classified. Exposure to the notified polymer at up to 10% is likely during repackaging, reformulation (blending), end use applications, and during cleaning of pump, transfer lines and maintenance work on equipments. However, considering the use of PPE and engineering controls during these procedures, exposure is expected to be minimal. In addition, final enduse concentration is very low (<1 ppm). Therefore, the risk to workers is expected to be low. Furthermore, the notified polymer has high molecular weight, expected low absorption and the control measures in place for the highly alkaline product containing the notified polymer will also ensure sufficient protection against the notified polymer.

6.3.2. Public health

The risk to public health is considered to be negligible since the products containing the notified polymer are not available to the public and exposure will not occur.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1 Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer is not manufactured locally, and will be imported either in concentrated form or in a formulated end-use product. Local operations include formulating concentrated imported notified polymer, and transferring to larger transport containers. During blending, water used to flush the pump is reused as part of the finished batch. The 20,000 L Isotainers containing the finished product are returned to the blender for reuse. The notifier estimates that a maximum of 2% of the notified polymer would be lost during spillage as a result of connecting and disconnecting pumps and hoses. The empty imported IBCs are rinsed with water and the rinsate is re-used. IBCs are retuned to the manufacturer. During repackaging it is estimated that a maximum of 1% of the notified polymer would be lost during spillage as a result of connecting and disconnecting pumps and hoses. Release of the notified polymer may also arise in the event of accidental leaks during transfer between containers. It is estimated that a maximum of 0.5% of the notified polymer would be lost as a result of leakage due to damage to containers.

Spill kits are in place in the storage and production areas. Spills are collected with inert absorbent material and disposed of through a licensed waste disposal contractor. Spilled material will be collected with inert absorbent material and only trace amounts of material will remain. Flushing with water and detergent will clean the area of spill and the waste material will go to a drain in the floor where it is collected in a pit. The pit is cleaned periodically and waste collected is sent off site for disposal to landfill by a licensed waste contractor. No notified polymer enters the sewer system.

RELEASE OF CHEMICAL FROM USE

Minimum release of the notified polymer is anticipated once it is delivered into the Bayer Process, as this process is a closed loop system and discharge to the environment is expected to be minimal.

The flow in a Bayer Plant ranges from 500 cubic meters/hr for a small plant to 2500 cubic meters/hr for a large plant. The dose of the formulated product is expected to be <10 ppm (as sold). Therefore, the amount of notified polymer used in the Bayer Process is <1 ppm, depending on the size of the plant.

During the Bayer Process, approximately 5000 tonnes of caustic red mud and sand are produced daily. To handle the vast quantities of red mud and manufacturing wastes, two large on-site tailing dams are typically constructed with a multi-layered base of compacted clay and PVC membrane with a further inner layer of yellow sand housing the underdrain system, which collects the water. This multi-layered base prevents leaching of the dilute caustic liquor containing the notified polymer into groundwater, which may be very close to the surface.

The caustic sand and mud waste are sent to the first disposal dam for treatment to separate the solids and recycle the water for further use. After thickening, the mud slurry is pumped to drying beds, distributed over the surface to a depth of less than one metre and sun dried to at least 65 to 70% solids before distribution of the next mud layer. The remaining supernatant in the settling dam is sent to a second dam where it is returned to the bauxite refinery to be used as wash water to the mud washers, as hose water and as cooling water.

There is a new technique in place by companies involved with the production of alumina, which involves the storage of bauxite residue thereby reducing environmental effects, requiring less land, and making the alumina-refining by-product accessible for alternative uses and surface reclamation. This technique is known as "Dry Stacking". Dry stacking involves taking bauxite residue from refineries, reducing the water content through thickening and spreading the material in 0.5 metre layers for further drying via evaporation and drainage. The residue's final density is about 30% higher than that achieved in the previously used wet disposal areas. The higher density and lower water content in the deposit means less risk of seepage and groundwater contamination. This technique also enables residue recovery for reuse and rapid rehabilitation for alternative land uses.

Residues remaining in the imported 1000 kg totes and bulk containers will be used in blending process. The empty 1000 kg IBC and/or Isotankers will be rinsed with suitable solvent. The residue will be disposed of to landfill. The total residues in the containers are expected to account for up to <2 %/year. The empty IBCs and isotankers will be reused.

RELEASE OF CHEMICAL FROM DISPOSAL
The notified polymer is expected to strongly associate with the caustic red mud, and will, therefore, share its fate. Direct release of notified polymer to the aquatic environment is not expected at any point in the notified polymer's proposed lifecycle. Notified polymer that is disposed of to landfill is expected to associate with soil and sediment, based on functional groups present, and overtime degrade via biotic and abiotic processes to form simple organic and silicon containing compounds.

7.1.2 Environmental fate

No environmental fate data were submitted.

7.1.3 Predicted Environmental Concentration (PEC)

As direct release to the aquatic environment is not expected, it is not possible to calculate a PEC.

7.2. Environmental effects assessment

No ecotoxicity data were submitted. The notified polymer contains polycationic functionality and may, therefore, have significant toxicity to aquatic organisms.

7.2.1 Predicted No-Effect Concentration

As ecotoxicity data are not available for the notified polymer, it is not possible to calculate a Predicted No-Effect Concentration.

7.3. Environmental risk assessment

Despite the relatively large quantities of the notified polymer involved and the potential significant toxicity to aquatic organisms, the proposed use pattern precludes significant direct release to the aquatic environment at any stage in its proposed life-cycle within Australia. Physical engineered barriers exist to contain any spilt or released notified polymer at both the site of formulation, in the form of bunding, as well as at the site of end-use, in the form of lined dams. Therefore, given the lack of aquatic exposure when used in the proposed manner, the notified polymer is not considered to pose an unacceptable risk to the aquatic environment.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available data the notified chemical cannot be classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)].

And

Similarly, it is not possible to categorise the notified chemical according to the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations 2003) for either health or environmental effects

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

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

Environmental risk assessment
On the basis of the reported use pattern, the notified polymer is not considered to pose an unacceptable risk to the environment.

Recommendations

CONTROL MEASURES
Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified chemical as introduced:
  - Ensure appropriate ventilation is provided.

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced:
  - Minimise spills and drips
  - Avoid contact with eyes and skin.
  - Avoid aerosol formation.

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced:
  - Protective clothing
  - Chemical-resistant 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 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Disposal of concentrated notified polymer

- Concentrated notified polymer should be disposed of to secure landfill.

Emergency procedures

- Spills or accidental release of the notified polymer 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
- the polymer has a number-average molecular weight of less than 1000;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the chemical has changed from scale inhibitor in processing of aluminium ore (the Bayer process), or is likely to change significantly;
- the amount of chemical being introduced has increased from 300 tonnes/annum, or is likely to increase, significantly;
- if 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 MSDS of the products containing the notified polymer provided by the notifier were reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Water Solubility 0.96% at pH 7

Method	Visual estimation with TD-SEC verification.
Remarks	Notified substance was added to 10 mL of neutral MilliQ water in 10 µL increments with continual stirring and with pH being maintained at approximately 7 using additions of 0.5N HCl. The concentration at which visual precipitation occurred was verified using TD-SEC.
Test Facility	Stamford Research Laboratories, 10 December 2007, Study No. 231936. (Unpublished Report)

BIBLIOGRAPHY

FORS (Federal Office of Road Safety) (1998) Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 6th Edition, Canberra, Australian Government Publishing Service

NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2nd edition [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

United Nations (2003) Globally Harmonised System of Classification and Labelling of Chemicals (GHS). United Nations Economic Commission for Europe (UN/ECE), New York and Geneva.