File No PLC/1250

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

BDF-454

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

March 2015

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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/1250	Halliburton Australia Pty Ltd	BDF-454	No	≤ 50 tonnes per annum	Filtration control agent for oil and gas drilling

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

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state territory and local government legislation.

Storage

- The following precautions should be taken by workers regarding storage of the notified polymer:
  - Store in a segregated and approved area.
  - Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (oxidising substances, strong acids, strong bases).

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 filtration control agent for oil and gas drilling, 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 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

Applicants
Halliburton Australia Pty Ltd (ABN: 73 009 000 775)
Level 17, 444 Queen Street
BRISBANE 4000

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/impurities, use details and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)
BDF-454

Molecular Weight
Number Average Molecular Weight (Mn) is > 10,000 Da

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
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	White solid granulate
Melting Point/Glass Transition Temp	68-75 °C
Density	530 kg/m^3 at 20 °C
Water Solubility	Insoluble
Particle Size	D10 (%): 0.110 mm; D50 (%): 0.376 mm; D90 (%): 0.645 mm
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	10-50	10-50	10-50	10-50	10-50

Use
The notified polymer will be used as a filtration control agent in high pressure high temperature oil and gas drilling operations.

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 tests submitted on the following toxicological endpoints.

Endpoint	*Result*	*Effects Observed?*	*Test Guideline*
Rat, acute oral	LD50 > 2000 mg/kg bw	no	OECD TG 401
Rabbit, skin irritation	non-irritating	no	OECD TG 404
Skin sensitisation - non-adjuvant test	no evidence of sensitisation	no	OECD TG 406 (Maximisation test)

All results were indicative of low hazard.

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

The notified polymer will be imported neat, in solid form, and will not be reformulated in Australia. Therefore, no environmental release is expected from manufacture or reformulation in Australia. Any import container residue or spills of the notified polymer will be contained and disposed to landfill in accordance with local regulations.

During use, the notified polymer will be pumped directly into drilling wells. The notifier has indicated that after the completion of drilling operations, the drilling mud containing the notified polymer will be retrieved and a portion will be reused following reconditioning. Approximately 75% of the notified polymer in the drilling mud will be reused. The remaining 25% of the notified polymer in the drilling mud will be disposed in accordance with local regulations. Solids generated during substrate reconditioning will be disposed to landfill.

The results from ecotoxicological investigations conducted on the notified polymer are summarised in the table below.

Endpoint	*Result*	*Assessment Conclusion*
Daphnia Toxicity *Acartia tonsa* (48 hours)	NOEL = 1800 mg/L (WAF*)	Not harmful
Algal Toxicity *Skeletonema costatum* (72 hours)	NOE_rL = 1000 mg/L (WAF*)	Not harmful
Sediment Dwelling Organism Toxicity *Corophium volutator* (10 days)	NOEC = 1431.1 mg/kg (dry wt)	Not harmful

* WAF: Water Accommodated Fraction

All results were indicative of low hazard. Based on the above endpoints, the notified polymer is not considered to be harmful to fish, daphnids, and algae up to the limit of its water solubility. The notified polymer is also not harmful to sediment dwelling organisms. Based on the toxicity to aquatic biota, the notified polymer is not classified under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS; United Nations, 2009) on acute and chronic bases.

The notified polymer is not expected to be readily biodegradable (6% in 28 days). It is also not expected to cross biological membranes due to its high molecular weight and low water solubility, and is therefore 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.

A predicted environmental concentration (PEC) has not been calculated since no significant release of the notified polymer to the aquatic compartment is expected from the reported usage pattern.

A Predicted No-Effect Concentration (PNEC) for the aquatic compartment has not been calculated since the notified polymer is not harmful to aquatic organisms up to the limit of its water solubility.

The Risk Quotient (RQ = PEC/PNEC) has not been calculated since the PEC and PNEC have not been calculated. The notified polymer is not harmful up to the limit of its water solubility and no significant release to the aquatic compartment is anticipated.

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