

File No: NA/527

March 1998

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Polymer in MCP 1756**

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act* 1989 (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 Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Family Services.

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Director  
Chemicals Notification and Assessment

**FULL PUBLIC REPORT****Polymer in MCP 1756****1. APPLICANT**

Hellay Laboratories Pty Ltd of 8/9 Monterey Road DANDENONG VICTORIA 3075 has submitted a limited notification statement in support of their application for an assessment certificate for Polymer in MCP 1756.

**2. IDENTITY OF THE CHEMICAL**

Polymer in MCP 1756, is considered not to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, molecular and structural formulae, molecular weight and spectral data have been exempted from publication in the Full Public Report and the Summary Report.

**Other Names:** MCP 1756  
Additive 2

**3. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance at 20°C and 101.3 kPa:</b>	clear brown liquid with a slight amine odour
<b>Boiling Point:</b>	143°C
<b>Relative Density:</b>	0.92335 at 20.5 ± 0.5°C
<b>Vapour Pressure:</b>	3.5 x 10 <sup>-10</sup> kPa at 25°C
<b>Water Solubility:</b>	20 mg.L <sup>-1</sup> at 25°C
<b>Partition Co-efficient (n-octanol/water):</b>	log P <sub>ow</sub> 3.56 (shake flask method)
<b>Hydrolysis as a Function of pH:</b>	not determined
<b>Adsorption/Desorption:</b>	not determined
<b>Dissociation Constant:</b>	not determined

<b>Viscosity:</b>	345.6 cSt and 24.5 cSt at 40°C and 100°C
<b>Flash Point:</b>	160°C
<b>Flammability Limits:</b>	not determined
<b>Autoignition Temperature:</b>	348°C
<b>Explosive Properties:</b>	not explosive
<b>Reactivity/Stability:</b>	stable under room conditions; reacts with strong oxidising agents giving out nitrogen oxides and carbon monoxide

### Comments on Physico-Chemical Properties

Hydrolysis data could not be generated because of the relatively low water solubility but the polymer may be expected to bind with soils and sediment. Adsorption and dissociation could also not be determined because of the relatively low water solubility. While the notified substance contains amides and esters it should not hydrolyse in the environmental pH range of 4 to 9. The polymer does not contain functionalities which will gain or lose a proton.

<b>Method of Detection and Determination:</b>	infrared (IR), ultraviolet-visible (UV) and nuclear magnetic resonance (NMR) spectra were provided for the notified chemical
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## 4. PURITY OF THE CHEMICAL

<b>Degree of Purity:</b>	75 - 85%
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### Toxic or Hazardous Impurities:

<i>Chemical name:</i>	bis(2-ethylhexyl) amine
<i>CAS No.:</i>	106-20-7
<i>Weight percentage:</i>	15 - 25
<i>Toxic properties:</i>	severe skin and eye irritant; a contact sensitiser (1)

<b>Maximum Content of Residual Monomers:</b>	not disclosed
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<b>Additives/Adjuvants:</b>	not disclosed
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## **5. USE, VOLUME AND FORMULATION**

The notified chemical is intended to be used as a non-emulsive dispersant in combined cycle turbine oils for industrial applications. The use of the chemical will provide improved oxidative stability and water separability, thus extending the service life of the lubricant. It will not be manufactured in Australia but will be imported in the finished oil at concentrations of approximately 0.2% by weight. Import volume in the first year will be 500 kg, rising to less than 1 000 kg per annum for the next four years.

## **6. OCCUPATIONAL EXPOSURE**

The notified chemical will be imported as a component in turbine oil in sealed 200 L drums. There is no reformulation or blending of the end-use product containing the chemical in Australia. The bulk liquid will be transported by road tanker to customer application sites. Initially steel drums containing the chemical will be connected to the lubricant reservoir by tubing and the oil is pumped into the reservoir. Therefore, there is potential for workers to be exposed during transfer of the notified chemical when fitting and disconnecting lines. If exposure occurred it would most likely be via dermal route and a lesser extent by the ocular route.

There is potential for maintenance workers to be exposed to the notified chemical during maintenance operations. Once again the dermal route is the most likely route of exposure.

The low concentration of the notified chemical in the oil will limit worker exposure during industrial applications.

Workers involved in recycling empty drums will be exposed to very low levels of the notified chemical considering the low concentration in the oils.

## **7. PUBLIC EXPOSURE**

Turbine oils containing the notified polymer will be used in industrial sites only and will not be sold to the public. Turbines oils are usually used in contained structures, and releases are not expected during normal operations. No public exposure from transport or use is expected to occur except in the event of an accident.

Used oils are recycled for use as burning oil at a local energy recovery centre or an industrial kiln such as a cement kiln, or disposed by incineration. Accidental spills will be contained with fire retardant treated absorbents such as sawdust and diatomaceous earth and disposed of to approved industrial facilities. Therefore, public exposure from disposal is expected to be negligible.

## **8. ENVIRONMENTAL EXPOSURE**

### **Release**

The notified polymer will be imported into Australia in sealed drums as a component in a finished oil. No release to the environment is expected during transport and storage except in the case of spills. Once received by the customers, a variety of methods for storage and dispersal into turbines may be used. The majority of customers will store the finished oil containing the new substance in the sealed drums for direct transfer, by trained industrial personnel, into turbines using pumps and/or faucets. If the pumps and faucets are handled properly with care, release to the environment is not expected aside from the loss of a few drops of finished oil per transfer. Oil in turbines is drained at intervals of 40,000 to 100 000 hours (~ 4-11 years) and typical fill volumes range from 7 500 to 11 000 L.

The notifier estimates that losses of the new substance resulting from filling and topping up, use and changing of turbine oils will be less than 1 kg annually. This estimate implies that only 0.2% of turbine oil is lost through the above causes. This is equivalent to a turbine with an oil capacity of 11,000 L losing some 22 L of oil per year. This is considered to be a very conservative estimate. However, turbines are usually housed within buildings so accidental releases are expected to be contained and release to the environment is not expected during normal operation. The application states that used oil can be used as a fuel to generate energy or for industrial use, for example in cement kilns. At the temperatures used in these applications all components of the oil should be destroyed. Oil not fit for industrial use will be disposed of by high temperature incineration.

### **Fate**

The notifier does not expect release of the notified chemical to the environment will occur under normal operating conditions. However, losses may occur during transport of the drums and any further handling, as well as from the draining and charging of turbines. Any notified chemical that enters sewers/waterways is likely to become associated with sludge/sediment due to the chemical's high octanol-water partition coefficient and low water solubility. No data were provided for biodegradation but this is acceptable for the limited import volume (less than 1 tonne) and the limited environmental exposure. Bioaccumulation is not expected due to the high molecular weight of the notified polymer.

## **9. EVALUATION OF TOXICOLOGICAL DATA**

No toxicity data are required for polymers with NAMW greater than 1 000 and for chemicals which will be imported at volumes of less than 1 tonne per annum, according to the Act. However, the data summarised below were provided by the notifier.

## 9.1 Acute Toxicity

### Summary of the acute toxicity of Polymer in MCP 1756

<i>Test</i>	<i>Species</i>	<i>Outcome</i>	<i>Reference</i>
acute oral toxicity	rat	LD <sub>50</sub> > 2 500 mg/kg	(2)

#### 9.1.1 Oral Toxicity (2)

<i>Species/strain:</i>	rat/Sprague Dawley
<i>Number/sex of animals:</i>	5/sex
<i>Observation period:</i>	14 days
<i>Method of administration:</i>	gavage; maximal dose 2 000.mg.kg <sup>-1</sup>
<i>Clinical observations:</i>	none
<i>Mortality:</i>	nil
<i>Morphological findings:</i>	nil
<i>Test method:</i>	according to OECD Guidelines for Testing of Chemicals (3)
<i>LD<sub>50</sub>:</i>	> 2 000 mg.kg <sup>-1</sup>
<i>Result:</i>	the notified chemical was of low acute oral toxicity in rats

## 9.2 Genotoxicity

#### 9.2.1 *Salmonella typhimurium* Reverse Mutation Assay (4)

<i>Strains:</i>	<i>Salmonella typhimurium</i> TA98, TA100, TA1535, TA1537, TA1538 and <i>Escherichia coli</i> WP2uvrA
<i>Concentration range:</i>	10 - 1 000 µg/plate with or without liver microsomal activation
<i>Test method:</i>	similar to OECD guidelines (3)
<i>Result:</i>	not mutagenic in this system

## 9.3 Overall Assessment of Toxicological Data

The notified chemical had a low acute oral toxicity to rats with LD<sub>50</sub> value greater

than 2 000 mg.kg<sup>-1</sup>.

In a genotoxicity study the notified chemical was found to be non-mutagenic (Ames test).

On the basis of these limited tests the notified chemical would not be classified as hazardous according to National Occupational Health and Safety Commission's (NOHSC) *Approved criteria for Classifying hazardous Substances* (5).

## **10. ASSESSMENT OF ENVIRONMENTAL EFFECTS**

No ecotoxicological data were provided which is acceptable for polymers with import volumes less than 1 tonne per year according to the Act.

## **11. ASSESSMENT OF ENVIRONMENTAL HAZARD**

The notified chemical is a minor component of turbine oil and any leaks or spillages should be retained within buildings housing the turbines. Releases of the notified chemical to sewers are not expected under normal operating conditions. In the unlikely event of accidental release to the environment, any notified substance that enters waterways or sewers is likely to become associated with sludge or sediment due to its high octanol-water partition coefficient and relatively low water solubility. After use the turbine oil will either be burnt for its energy value or incinerated at high temperature. Therefore, the notified chemical is unlikely to present a significant hazard to the environment from its proposed use due to the expected low environmental exposure.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

The notified chemical will be used as a non-emulsive dispersant in turbine oils, it will be in a liquid formulation containing approximately 0.2% of the notified chemical. The notified chemical has a low water solubility and a high octanol/water coefficient, it is therefore likely to bioaccumulate. As the molecular weight of the notified chemical is greater than 500 daltons absorption across biological membranes such as skin is unlikely.

The notified chemical would not be classified as hazardous according to NOHSC *Approved Criteria for Classifying Hazardous Substances* (5) on the basis of an acute oral toxicity study and an *in vitro* genotoxicity study.

The major opportunity for exposure to the notified chemical will be during filling lubricant reservoirs and routine maintenance operations. Exposure of the skin to spills, drips or splashes may occur.

The risk of adverse occupational health effects may be considered to be low primarily because of the low hazard of the notified chemical but also due to the

infrequent exposure to the turbine oil and the low concentration of the notified chemical (approximately 0.2%) in the oil. It should be noted, however, that the imported turbine oil contains bis(2-ethylhexyl) amine which is a severe skin and eye irritant as well as a contact sensitiser. This is a residual starting material. Due to manufacturing constraints, the amine can not be extracted completely. It will only be present at less than 0.04% in the imported turbine oil and the formulation is not considered hazardous and is of low occupational health risk.

Negligible public exposure is expected to occur from the proposed industrial use of turbine oils containing the notified chemical and recycling or disposal of used oil. Public exposure from accidental spills will be minimised by the accidental release measures outlined in the Material Safety Data Sheet (MSDS).

### **13. RECOMMENDATIONS**

To minimise occupational exposure to Polymer in MCP 1756 the following guidelines and precautions should be observed:

- It is good work practices to wear industrial clothing which conforms to the specifications detailed in Australian Standard (AS) 2919 (6), impermeable gloves or mittens which conform to AS 2161 (7) and occupational footwear which conforms to Australian and New Zealand (AS/NZS) 2210 (8) to minimise exposure when handling any industrial chemical;
- Spillage of products containing the notified chemical should be avoided, spillages should be cleaned up promptly and put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion; and
- A copy of the MSDS should be easily accessible to employees.

### **14. MATERIAL SAFETY DATA SHEET**

The MSDS for the product (MCP 1756) containing the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (9).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

### **15. REQUIREMENTS FOR SECONDARY NOTIFICATION**

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.



## 16. REFERENCES

1. Sax N.I. and Lewis R.J. Sr Eds, *Dangerous Properties of Industrial Materials*, 7th Ed., Van Nostrand Reinhold, 1989.
2. Mallory, V.T. 1997, *Acute Oral Toxicity Study with MCP 1756 in rats*, Project no., 66771, Pharmakon USA, Pennsylvania.
3. Organisation for Economic Co-operation and Development 1995-1996, *OECD Guidelines for the Testing of Chemicals on CD-Rom*, OECD, Paris.
4. Wagver, V.O. 1996, *Salmonella Typhimurium Reverse Mutation Assay with MCP 1756*, Project no., 66786, Microbiological Associates Inc, New Jersey.
5. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]*, Australian Government Publishing Service, Canberra.
6. Standards Australia 1987, *Australian Standard 2919-1987, Industrial Clothing*, Standards Association of Australia, Sydney.
7. Standards Australia 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding electrical and medical gloves)*, Standards Association of Australia Publ., Sydney.
8. Standards Australia/Standards New Zealand 1994, *Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear*, Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.
9. National Occupational Health and Safety Commission 1994, *National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]*, Australian Government Publishing Service, Canberra.