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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

MCP 1602

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

MCP 1602

1. APPLICANT

Hellay Laboratories of 8/9 Monterey Rd DANDENONG VIC 3075 has submitted a standard notification statement with their application for an assessment certificate for MCP 1602.

2. IDENTITY OF THE CHEMICAL

MCP 1602 is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore, the exact molecular weight, low molecular weight species, spectral data and trace amounts of hazardous impurities have been exempted from publication in the Full Public and Summary Reports.

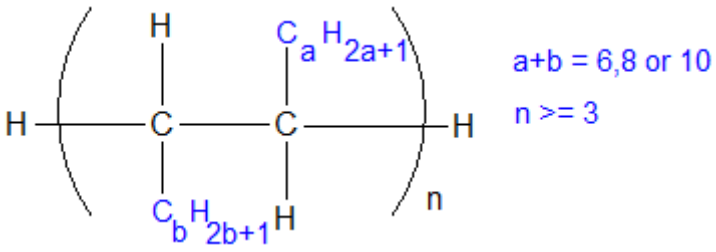
Chemical name: 1-dodecene, polymer with 1-decene and 1-octene, hydrogenated

Chemical Abstracts Service (CAS) Registry No.: 163149-28-8

Other names: Polyalpha olefins, PAO

Trade name: MCP 1602

Structural formula:



Molecular weight: < 1 000

Weight percentage of ingredients:

Chemical Name	*CAS No.*	*Weight %*
1-decene	872-05-9	2-98%
1-octene	111-66-0	2-50%
1-dodecene	112-41-4	2-50%
hydrogen	1333-74-0	< 1%

Method of detection and determination: gas chromatography

Spectral data: a gas chromatogram was provided

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa: odourless, clear liquid

Boiling Point: 369°C (at 760 mm Hg - ebulliometric method, ASTM D1120-72)

Specific Gravity: 0.822 at 25°C (ISO Recommendation R1183)

Vapour Pressure: 5.5×10^{-8} kPa at 25°C (vapour pressure balance)

Water Solubility: < 1 ppm (estimated and TLC, see comments below)

Fat Solubility: miscible with coconut fat at 20°C

Partition Co-efficient (n-octanol/water): log P_{OW} > 6 (estimated, see comments below)

Hydrolysis as a function of pH: not determined

Adsorption/Desorption: not determined

Dissociation Constant: not determined

Flash Point: 218°C at 100.9 kPa

Autoignition Temperature: 326°C at 100.6 kPa

Explosive Properties: not explosive

Reactivity/Stability: stable to light and heat; reacts with strong oxidisers

Comments on Physico-Chemical Properties

Water solubility and octanol/water partition coefficient are estimated from the relevant characteristics of MCP 1602. Estimation of the $logP_{ow}$ using molecular connectivity indices (1) was based on the dimer. The partition co-efficient for the trimer and greater carbon chain lengths will have higher coefficients. The water solubility of 3.0×10^{-8} to 1.4×10^{-6} g/L was estimated from the partition co-efficient. A "measured" water solubility of < 0.4 ppm was determined from a TLC method (solubility was below level of detection).

Hydrolysis, adsorption/desorption and dissociation constant were not determined because of the expected low water solubility and that they could not be measured analytically. The notifier also states in a report prepared by Stonybrook Laboratories Inc and submitted to Canadian authorities, that the polymer contains no functionalities that would be subject to hydrolysis, or dissociation, under the expected environmental conditions of use. If MCP 1602 was spilt into unbuffered water, which became saturated, the maximum pH change of this water would be +0.37 pH units. While the polymer cannot be measured analytically and adsorption/desorption cannot be determined, mobility through soil would be slow because of its expected strong adsorption to or association with soil because of its high log P_{OW}.

The solubility of the notified polymer in fat was determined using coconut fat, which the notifier claims is similar to the "standard fat" used in the OECD guidelines (OECD 116-7). The notified polymer and coconut fat were determined to be miscible liquids.

4. PURITY OF THE CHEMICAL

Degree of purity:	> 99%
Toxic or hazardous impurities:	toxic impurities are present at levels below 0.01%
Non-hazardous impurities (> 1% by weight):	none
Additives/adjuvants:	< 0.005%

5. USE, VOLUME AND FORMULATION

The notified chemical is intended to be used as a synthetic base stock for use in lubricating oils for consumer use (automotive oils) where it will comprise 60-80% of the finished oil. The notified chemical will also be used in industrial applications comprising 75-90% of the finished oil. The notified chemical is intended to be imported at a rate of < 1 000 tonnes per year for the first five years.

6. OCCUPATIONAL EXPOSURE

The notified chemical will be imported as a component of a finished oil in 200 L steel drums or in 20 000 L isocontainers. Exposure to transport workers is possible in the rare event of an accident.

Repackaging into 1 L or 4 L containers for consumer use may involve the use of any of a number of different pump types and may include those operated by hand, air or electrical means. Automated pumps will be used for repackaging the notified chemical from the isocontainers and the majority of the drums. Exposure to the notified chemical is expected to be low but some drips and spills may be expected on each transfer from opening of drums and when lines are connected or disconnected.

Manual pumps will be used for repackaging if the number of drums (and/or surrounding conditions) limit the use of automated pumps.

During use of the finished oil in the industrial setting as gear and hydraulic oils, individuals may be exposed to drips and spills on addition to and removal from the closed systems.

Disposal of waste oil is accomplished by a contractor at industrial sites. The oil is then either burned as fuel or disposed of by high temperature incineration. The oil is presumed to be pumped into a storage container for transport with exposure to drips and spills a possibility.

7. PUBLIC EXPOSURE

Public exposure to the notified substance is expected to be widespread as the automotive oil is sold direct to the public. Public exposure will occur when changing the oil at home. Dermal exposure to the automotive oil is the most likely exposure route. From its use as an industrial oil, minimal public exposure is expected.

The notified substance will be released into the environment when the used oil is disposed of or recycled. The oil is disposed of by incineration.

In the case of accidental spillage during transport, the public may be exposed to the notified chemical. However, the exposure will be minimal if the spills are contained and cleaned up by the recommended practices as outlined in the Material Safety Data Sheet (MSDS). MCP 1602 is lighter than water and is hydrophobic thus facilitating easy clean up of spills.

8. ENVIRONMENTAL EXPOSURE

Release

The notified polymer will be imported as part of a finished product, thus there will be no manufacture or reformulation processes in Australia.

The major source of environmental release of the notified polymer is in the unlikely event of an accident during transport and/or handling of the oil product. The oil can be contained with inert materials and the mixture can be shovelled into a suitable container for disposal.

The product containing the notified polymer will be repackaged into 1 and 4 L containers. This will be principally carried out by one oil company at one site. The notifier claims that if the equipment is operating properly and correct procedures are followed, no leakage or spillage during repackaging is anticipated. The equipment will be cleaned by either having air blown through the lines, or flushing them with water or a solvent (depending upon compatibility with other products). This resultant waste will be collected by a hazardous waste hauler and disposed of in accordance with applicable regulations.

The notifier has estimated the residue of polymer remaining in the 200 L drums to be less than 0.3 kg, and in the 20 000 L isocontainers to be less than 35 kg. This equates to approximately 805 kg per year with a maximum import of 460 tonnes. The drums and isocontainers will be collected by a reconditioner. Washings from the cleaning process will be passed to an on-site waste water treatment plant (in accordance with water authority regulations). The drums and isocontainers will be put back into circulation.

Residues in the 1 and 4 L containers used by the general public are estimated at less that 0.008 kg. The containers are made of recyclable plastic and consumers are encouraged to recycle them. However, many of these containers are likely to be disposed of to landfill.

The amount of notified polymer that may be lost to the environment during handling and use has been estimated by the notifier to be less than 70 kg per year. The notifier claims that the new synthetic oil product has a significantly longer life than mineral based oils, thus its draining interval is longer. This extended interval between oil changes results in less waste.

The industrial oils containing the notified polymer will be used in gear oils and hydraulic oils, both of which are closed systems with limited potential for environmental exposure. Hydraulic systems lose very little volume over the service life of the oil (2). Automotive oils will be supplied to automotive supply stores, automotive garages and automotive dealers. Release to the environment of the oils may occur due to engine leaks and during engine oil changes. Collected used oils will be either re-used/recycled/cleaned or burnt for their fuel value.

Fate

The notified polymer will be used in automotive and industrial oils and will share their fate. Therefore, most spent oil will be combusted, if used for fuel or recycled. A minor component will be released to the environment from spills and leaks, but this would be widely dispersed. If the notified polymer was washed off road surfaces, it would be expected to adsorb to soils or sediments adjacent the road.

Collection of waste oils is more easily accomplished from industrial and commercial users than from the small but significant quantity arising from the section of the community that changes its own (D-I-Y market) (2). The notifier has indicated that 236 tonnes of the polymer will be used in the oil product supplied for automotive lubricants. It is estimated from the ANZECC Report (2) that 35% of the oil used for automotive purposes will not be collected and could be disposed of in an inappropriate manner[1].

- ***biodegradation***

The ability of MCP 1602 to biodegrade was assessed using the Shake Flask Method (US EPA 560/6-82-003, CG-2000) with an unacclimated sewage/soil innoculum. Carbon dioxide evolution was measured. MCP 1602 was tested at two concentrations of 10 and 20 mg carbon/L, and gave 26.8% and 41.0% conversion to CO_2, respectively, after 28 days. Therefore, MCP 1602 cannot be classed as readily biodegradable. However, from the results, inherent biodegradability may be expected.

- ***bioaccumulation***

The bioaccumulation potential of the notified polymer was not determined. The notifier claims that it is not likely to bioaccumulate because the material is practically water insoluble and its log P_{OW} is at least 6.8. It is also expected not to degrade or to be mobile in landfills. The literature (3) suggests that its low water solubility (<< 0.002 mol/m^3) is likely to limit bioaccumulation.

9. EVALUATION OF TOXICOLOGICAL DATA

9.1 Acute Toxicity

Summary of the acute toxicity of MCP 1602

Test	*Species*	*Outcome*	*Reference*
acute oral toxicity	rat	LD_{50} > 2 000 mg/kg	(4)
acute dermal toxicity	rabbit	LD_{50} > 2 000 mg/kg	(5)
skin irritation	rabbit	slight irritant	(6)
eye irritation	rabbit	slight to moderate irritant	(7)
skin sensitisation	guinea pig	non-sensitiser	(8)

[1] No figures are available for how much automotive oil was collected for re-use, but an estimate of about 35% of all oil sold is not collected and possibly disposed of in an inappropriate manner. Therefore, this percentage will be specifically applied to automotive oils.

9.1.1 Oral Toxicity (4)

Ten young adult Sprague-Dawley rats (five/sex) were administered a single dose of 2 000 mg/kg of MCP 1602 by gavage. The rats were observed for 14 days. No deaths occurred. There was no apparent treatment-related bodyweight change, however, this was difficult to assess without a control group for comparison. Soft stools were recorded in four animals within the first day of treatment. One male had coloured nasal discharge on day 14. Upon autopsy one male had a dilated pelvis in the kidney and one female had no food in the gastrointestinal tract and stomach. The oral LD_{50} of MCP 1602 in rats was greater than 2 000 mg/kg.

9.1.2 Dermal Toxicity (5)

Ten New Zealand White rabbits (five/sex) were dermally treated with 2 000 mg/kg of MCP 1602 under occlusive dressing for 24 hours. The observation period was 14 days. No deaths occurred. Bodyweights were variable. Soft stools were noted in all animals, generally one day after exposure. Slight to moderate irritation was observed on the test site of all animals on day two. In all animals dermal irritation was not present by day 13. The dermal LD_{50} of MCP 1602 in rabbits was greater than 2 000 mg/kg.

9.1.3 Skin Irritation (6)

Six New Zealand White rabbits (three/sex) received 0.5 mL of MCP 1602 on the intact skin under occlusive dressing for one and four hours. Corrosion did not occur on either the one-hour or four-hour test sites. Slight irritation was noted in all animals exposed to MCP1602 for four hours. This irritation was in the form of erythema (grade 1) and was observed at 4.5 hours for five rabbits and at hour 52 for the other animal. The mean erythema and edema scores were 0.1 and 0.0 and the primary irritation index was 0.0 (see attachment 1 for Draize scales). MCP 1602 was considered a slight irritant to rabbit skin.

9.1.4 Eye Irritation (7)

Six New Zealand White rabbits (three/sex) received 0.1 mL of MCP 1602 into the conjunctival sac of one eye. No irritation of the cornea or iris was observed. Moderate conjunctival irritation was noted in all animals after one hour, in the form of redness (grade 2-1), chemosis (grade 1) and discharge (grade 3). Slight irritation was noted in 2/6 animals after 72 hours. The Draize scores after 1, 24, 48 and 72 hours were: 10.0, 3.7, 1.3 and 0.7, respectively (see attachment 1 for Draize scales). The mean days 1-3 EEC scores (combined mean score for the first three evaluation periods) for conjunctival redness and swelling were 0.7 and 0.2, respectively. MCP 1602 was a slight to moderate eye irritant in rabbits.

9.1.5 Skin Sensitisation (8)

The skin sensitisation potential of MCP 1602 was studied in Hartley albino guinea pigs using the Buehler Test. A primary irritation study was carried out on four animals using four concentrations of MCP 1602. Guinea pigs were subjected to a six hour topical application of MCP 1602 (neat) under occlusive dressing once a

week for three weeks. 2,4-dinitrochloro-benzene (DNCB) (0.05% w/v in acetone) was used as a positive control group. Two negative control groups were used. Ten to fourteen days after the completion of the induction procedure all animals were challenged with either a topical application of MCP 1602 or DNCB.

None of the MCP 1602-treated animals responded to the challenge dose. All DNCB-treated animals displayed signs of induction. MCP 1602 when applied dermally was found to be a non-sensitiser in guinea pigs.

9.2 Repeated Dose Toxicity (9)

Sprague-Dawley rats (ten/sex/group) were treated dermally with 0, 125, 500 or 2 000 mg/kg/day of neat MCP 1602 five days per week for four weeks. An additional ten rats per sex (satellite group) were treated with 0 or 2 000 mg/kg/day MCP 1602 for four weeks (five days/week) and observed for a further 14 days. The application site was not covered. Elizabethan collars were fitted to minimise ingestion of the test substance. Residual test material was not wiped off. Along with the normal array of systemic toxicity parameters, dermal irritation and chronic deterioration of the skin were assessed.

One animal (satellite, control, female) died after blood collection. Irritation of the neck, presumably caused by the collar, was observed in a number of animals (including controls). Red nasal discharge was noted in all animals. Chromodacryorrhea was noted in nearly half of the animals. Dermal irritation of the application site did not occur.

Males treated with 2 000 mg/kg displayed decreased bodyweight gain. This difference was significant for satellite males. Increased food consumption was occasionally noted for 2 000 mg/kg females, although these appear not to be treatment-related.

The only significant difference in haematology parameters was an increase (twice the control and other treated groups) in segmented neutrophils in 2 000 mg/kg males at week five. The male satellite group did not show a significant increase in segmented neutrophils.

Satellite males which had been treated with 2 000 mg/kg MCP 1602 had significantly altered alkaline phosphatase, albumin/ globulin ratio, calcium and phosphorus levels at week five but not week seven. Triglyceride concentrations were significantly increased in satellite, 2 000 mg/kg females at both weeks five and seven.

No significant differences were noted in organ weights of control and treated animals. One high dose male (week five) had a scab in the treatment area. No other apparent treatment-related gross pathological abnormalities were noted.

After four weeks of dermal exposure to 2 000 mg/kg MCP 1602 rats displayed increased incidences of the following skin conditions: hyperplasia of the sebaceous glands for 18/20 rats, hyperplasia/ hyperkeratosis of the epidermis for 17/20 rats and dermal inflammation in 7/20 rats. After two weeks recovery no satellite-treated

females displayed any dermal histomorphological changes. However, 4/10 satellite-treated males had epidermal hyperplasia / hyperkeratosis.

9.3 Genotoxicity

9.3.1 *Salmonella typhimurium* Reverse Mutation Assay (10)

Strains of *Salmonella typhimurium* (TA98, TA1537, TA1538, TA100 and TA1535) were cultured with 0.1-10.0 mL/plate of MCP 1602 in tetrahydrofuran. Tetrahydrofuran was the only 'preferred' solvent in which MCP 1602 was soluble. The assays were performed either in the absence or presence of rat liver S9. The rat liver microsomal fraction (S9) was prepared from male Sprague-Dawley rats that had been treated with Aroclor 1254. 2-amino-anthracene, 2-aminoacridine, N-methyl-N'-nitro-N-nitrosoguanidine and 2-nitrofluorene were used as positive controls. Positive controls were dissolved in dimethyl sulphoxide. Vehicular controls were also used.

Due to the toxicity of tetrahydrofuran, only the plate incorporation assay was performed. There were no dose-related or significant increases in the number of revertant colonies in any of the test strains used, either in the presence or absence of metabolic activation. The positive controls behaved as expected. Under the test conditions, MCP 1602 was not mutagenic in *S. typhimurium*.

9.3.2 Chromosomal Aberrations in Chinese hamster ovary (CHO) cells (11)

Chinese hamster ovary cells (CHO-WBL) were treated with MCP 1602 in tetrahydrofuran. This study was performed in three parts; preliminary toxicity range study, metaphase assay and independent metaphase assay. These experiments were performed both in the presence or absence of metabolic activation. For metabolic activation, a microsomal liver fraction (S9) was prepared from male Sprague-Dawley rats that had been treated with Aroclor 1254. Tetrahydrofuran was used as a negative control. Mitomycin C and cyclophosphamide monohydrate (CP) were dissolved in Hank's Balanced Salt Solution (HBSS) and used as positive controls for the experiments without and with metabolic activation, respectively.

In the preliminary toxicity range study doses of 0.0032, 0.0063, 0.013, 0.025, 0.05, 0.10, 0.20, and 0.40 μL/mL MCP 1602 were used. The highest dose used was limited by the solubility of the test substance in the culture medium. In both cultures containing the S9 fraction and those without it there were no signs of obvious cytotoxicity. In the S9 mixture there was no reduction in Mitotic Index (MI) relative to the negative control. Only a slight reduction (9%) in MI was noted at 0.1mL/mL without metabolic activation. At 0.40 μL/mL MCP 1602 was not cytotoxic to Chinese hamster ovary cells.

In the metaphase assay cells were harvested 16 hours after exposure to 0.05, 0.10, 0.20 and 0.40 μL/mL MCP 1602. For the S9 mixture, a slight reduction in the MI was noted relative to the negative control. There was no increase in frequency of chromosomal aberrations in MCP 1602 mixtures. The positive control (CP) resulted

in 35% aberrant cells. For the mixture without S9, no reduction in MI relative to the negative control occurred. There was no increase in frequency of chromosomal aberrations in MCP 1602 mixtures. The positive control (Mitomycin C) resulted in 17% aberrant cells.

In the repeat metaphase assay cells were harvested 16 and 40 hours after exposure to 0.05, 0.10, 0.20 and 0.40 μL/mL MCP 1602. No reduction in MI compared to negative controls occurred in these assays. There was no increase in frequency of chromosomal aberrations in MCP 1602 treated cultures at both 16 and 40 hours. The positive controls behaved as expected.

Whether in the presence or absence of metabolic activation, MCP 1602 did not cause *in vitro* chromosomal aberrations in Chinese hamster ovary cells.

9.4 Overall Assessment of Toxicological Data

The oral and dermal acute toxicities of MCP 1602 were low in rats and rabbits, respectively. Limit tests at doses of 2 000 mg/kg for these routes of exposure resulted in no deaths of the test species. An acute inhalational toxicity study was not presented. As the notified substance (an oil) is non-volatile and has a high boiling point it is not expected to be inhaled. MCP 1602 was considered a slight irritant to rabbit skin. Ocular exposure to MCP 1602 caused slight to moderate irritation to rabbits. Dermal exposure to MCP 1602 did not result in skin sensitisation in guinea pigs. Rats exposed dermally to repeated doses of 2 000 mg/kg had increased incidences of hyperplasia of the sebaceous glands, hyperplasia/ hyperkeratosis of the epidermis and dermal inflammation. In general, these symptoms subsided after two weeks. Males from this dose group had decreased bodyweight gain and altered serum chemistry parameters. MCP 1602 did not induce gene mutation in *Salmonella typhimurium*. There was no increased frequency of chromosomal aberrations *in vitro* in Chinese hamster ovary cells exposed to MCP1602. Based on the studies presented MCP 1602 is not genotoxic.

The notified chemical would not be classified as hazardous according to Worksafe Australia's *Approved Criteria for Classifying Hazardous Substances* (12) in relation to the toxicological data provided.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

Ecotoxicity studies were conducted using MCP-1602 according to OECD guidelines (see table below). Due to the low water solubility of MCP-1602, test solutions were prepared to either give the water accommodated fraction, or kept in suspension through an oil-water dispersion generation system. In the former, used for water flea and algae, the oil and water are mixed well prior to testing, allowed to settle, and then the water phase used in subsequent testing. In the latter, fish were added to tanks which were continually stirred through the test - dosing with MCP-1602 was done within one hour of addition of the fish to the test tank.

Test solutions were analysed and no MCP-1602 could be measured[2]. The results indicate that MCP-1602 would be considered non-toxic to the organisms tested, up to the level of its solubility.

Summary of ecotoxicity studies

Test	***Species***	***Result*** (nominal concentrations[a], w/v, mg/L)
acute toxicity - 96 hr acute, static	rainbow trout (*Oncorhynchus mykiss*)	LC_{50} > 5010[b]
acute immobilisation 48 hr acute, static	water flea (*Daphnia magna*)	EC_{50} > 5220[c,d]
reproduction 3 brood, chronic static-renewal	water flea (*Daphnia magna*)	$EC_{50\ (survival)}$ & $IC_{50\ (reproduction)}$ > 5400[c,e]
growth inhibition 72 hr	algae (*Scenedesmus subspicatus*)	EC_{50} > 5220[c,d]

[a] all test solutions were analysed and were below the limt of quantitation (LOQ)[2]; [b] Test was conducted in an oil-water dispersion generation system (see text for details), LOQ = 87 mg/L, test solutions were cloudy; [c] Test was conducted with water accomodated fraction - see text for details; [d] LOQ = 2 mg/L; [e] LOQ = 1.1 mg/L

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

MCP-1602 will be used as a base for automotive and industrial oil blends. The main exposure will be from inappropriate disposal of oil. A worst case scenario would be if all the uncollected oil was dumped into a sewer in some country centre. This would give a concentration of about 45.2 mg/L per day[3]. For a major city, the amount would only be about 452 µg/L per day. The predicted environmental concentrations are several orders of magnitude lower than the worst observed environmental concentration of EC_{50} = 5010 mg/L for rainbow trout. (Ecotoxicity tests showed that the polymer is expected to be non-toxic to aquatic organisms up to the limit of its solubility.)

However, with its use Australia wide (*ie* not concentrated in one town or city), and with good industrial and public practice, aquatic exposure to the polymer is expected to be significantly less and at concentrations well below these levels.

[2] One exception at the start of the fish test that either indicated that the test solution had not reached equilibrium, as the test laboratory suggested, or that good mixing had not occured. The EPA suspects mixing was poor, as MCP-1602 was not measured in any of the test concentrations at the end of the test either.

[3] Given 35% of the oil is not collected, then of the 236 000 kg of the notified polymer in automotive oil for home use, 82 600 kg would not be collected (i.e. 35% x 236 000 kg). This would be 226 kg/d (i.e. 82 600 kg/365 d). The dilution at a rural town could reasonably be expected to be about 5 ML, while for a major city, say Melbourne, it would be 500 ML. This would give final concentrations of the oil of 45.2 mg/L per day and 452 µg/L per day, respectively.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Based on the submitted toxicological data, the notified chemical is not expected to exhibit acute or chronic toxicity, is not likely to be a skin sensitiser and is not likely to be genotoxic. However, it is likely to be a slight skin and a slight to moderate eye irritant.

Exposure of transport and storehouse workers to the notified chemical is only likely to occur in the rare event of an accident.

Exposure of workers involved in repackaging the finished oil containing the notified chemical into 1 L and 4 L containers is expected to be low. Repackaging will involve mainly automated equipment so that exposure is only likely when connecting and disconnecting lines to 200 L drums or 20 000 L isocontainers. The notifier states that the likelihood of exposure is slightly greater when manually operated pumps are used but is still likely to be low. In this case the volumes are likely to be low as the purpose is to provide samples to send to customers.

Use of the oil in the industrial setting as gear and hydraulic oil involves manual addition to and removal from various systems. Exposure to drips and spills is possible. It is expected there will be a similar likelihood of exposure to used oil when it is pumped into and removed from tanks for disposal by incineration.

The main occupational health risk to workers involved in repackaging the imported oil containing the notified chemical and in the use as a gear and hydraulic oil is likely to be slight skin irritation. This can be minimised by the use of protective gloves and clothing as outlined below. Moderate eye irritation is a potential health risk but ocular exposure is likely to be rare. The health risk to other workers handling containers of the chemical is likely to be minimal. In the case of workers involved in disposal of used oil, the risk of adverse health effects from oil contaminants is likely to be greater than that due to the notified chemical.

The most likely health risk to members of the public is also expected to be skin and eye irritation during charging and draining of automotive engines which can be minimised by wearing hand and eye protection and practising good personal hygiene.

13. RECOMMENDATIONS

To minimise occupational exposure to the notified chemical the following guidelines and precautions should be observed:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 (13) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (14);

- Industrial clothing should conform to the specifications detailed in AS 2919 (15);
- Impermeable gloves or mittens should conform to AS 2161 (16);
- All occupational footwear should conform to AS/NZS 2210 (17);
- Spillage of the notified chemical should be avoided, spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the MSDS should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (18).

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

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2. Australian and New Zealand Environment Council 1991, "Used lubricating oil: Generation, recovery and reuse in Australia", prepared by Technisearch Ltd for the Waste and Resources Committee (WRAC).

3. Connel DW 1989, "General Characteristics of organic compounds which exhibit bioaccumulation", Chapter 3, *in* Connel D W (ed) *Bioaccumulation of xenobiotic compounds*, CRC Press, Boca Raton, USA. p. 56.

4. Rodriguez S C *et al.* 1995, *Acute oral toxicity of MCP 1602 in the Sprague-Dawley rat*, Study No. 66105, Stonybrook Laboratories Inc., Princeton, NJ, USA.

5. Rodriguez S C *et al.* 1995, *Acute dermal toxicity of MCP 1602 in the New Zealand White rabbit*, Study No. 66106, Stonybrook Laboratories Inc., Princeton, NJ, USA.

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8. McClurg A L, Sheldon D L and Bailey P T 1995, *Seven week epicutaneous delayed contact hypersensitivity study in guinea pigs (Buehler Sensitisation Test) of MCP-1602 (CRU#94578)*, Study No. 66111, Stonybrook Laboratories Inc., Princeton, NJ, USA.

9. Feuston M H, Schreiner C A and Mackerer C R 1995, *Four-week systemic toxicity study of MCP-1602 administered dermally to rats*, Study No. 66109, Stonybrook Laboratories Inc., Princeton, NJ, USA.

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Attachment 1

The Draize Scale for evaluation of skin reactions is as follows:

Erythema Formation	*Rating*	*Oedema Formation*	*Rating*
No erythema	0	No oedema	0
Very slight erythema (barely perceptible)	1	Very slight oedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

CORNEA

Opacity	*Rating*	*Area of Cornea involved*	*Rating*
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 50%	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

CONJUNCTIVAE

Redness	*Rating*	*Chemosis*	*Rating*	*Discharge*	*Rating*
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Swelling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

IRIS

Values	*Rating*
Normal	0 none
Folds above normal, congestion, swelling, circumcorneal injection, iris reacts to light	1 slight
No reaction to light, haemorrhage, gross destruction	2 severe