Report of the Independent Expert Panel

Accord Environmental Credentials Scheme for Industrial and Institutional (I&I) Cleaning Products

May 2011

Contents

Executive summary

This report details the findings of an Expert Panel[1] commissioned by Accord to review the Accord Environmental Credentials Scheme for Industrial and Institutional (I&I) Cleaning Products ('Scheme').

The Panel was asked to provide their expert opinion regarding the suitability of the Scheme criteria in differentiating I&I cleaning products with superior environmental characteristics.

Industrial and institutional cleaning products are those products formulated for maintaining hygienic conditions in workplaces, institutions, warehouses and industrial facilities. Although efficacy is the number one consideration for these products, this Scheme was developed to identify products with environmentally preferable characteristics, provide reassurance to consumers regarding the claims made in relation to the product, reward companies who are 'doing the right thing' – by providing a competitive advantage for environmentally advanced formulations, and to be part of a journey for companies adopting more sustainable whole-of-business practices.

Overall, the Panel found that the criteria for determining I&I products with environmentally preferable characteristics are sound and robust, and congratulates those involved in determining the Scheme and the criteria. The Scheme is science (evidence)-based, targeted and pragmatic in considering the reality of use for these products. Additionally, the adoption of a sound and transparent accreditation process (including the use of a third-party assessor), should add to the credibility of the Scheme.

The Panel also made a number of recommendations to Accord aimed at strengthening the Scheme.

[1] The Panel members were: Professor Barry Hart, Director, Water Science Pty Ltd and Monash University; Professor Michael R. Moore, University of Queensland, Water Quality Research Australia; Dr Margaret Hartley, Formerly Director, Office of Chemical Safety and Principal Scientific Advisor, Australian Government Department of Health and Ageing.

1. Introduction

This report details the findings of the Expert panel regarding the Accord Environmental Credentials Scheme for Industrial and Institutional (I&I) Cleaning Products ('Scheme').

Industrial and institutional cleaning products are those products formulated for maintaining hygienic conditions in workplaces, institutions, warehouses and industrial facilities. Although efficacy is the number one consideration for I&I cleaning products, this Scheme recognises the increasing demand for products with preferable environmental characteristics by defining the characteristics of such products.

The Panel was commissioned by Accord as an independent expert body of toxicologists and environmental scientists to review the Scheme and verify that it will differentiate I&I cleaning products with preferable environmental characteristics.

The Panel's terms of reference were:

1. To provide an expert opinion regarding the suitability of the Scheme criteria in differentiating I&I cleaning products with superior environmental characteristics,
2. To provide an expert opinion regarding the unresolved issue described in Note 4 to Table 1 in Document 1,
3. To comment on other issues of relevance to this review.

The Panel members were:

- Professor Barry Hart, Director, Water Science Pty Ltd and Monash University,
- Professor Michael R. Moore, University of Queensland, Water Quality Research Australia,
- Dr Margaret Hartley, Formerly Director, Office of Chemical Safety and Principal Scientific Advisor, Australian Government Department of Health and Ageing.

The following documents formed the main basis for this review:

- Document 1 (Doc 1): Accord Environmental Credentials Scheme for Industrial & Institutional Cleaning Products – Draft Criteria, Accord[2], Sydney, 2011.
- Document 2 (Doc 2): Background paper on the Scheme's operation and governance, Accord[2], Sydney 2011.

Two of the Panel members (Prof. Hart and Prof. Moore) met on 12 May 2011 in Sydney, where they received presentations from the Accord team, and produced a first-draft report following a review of the two documents noted above. This report was subsequently refined and finalised via further input from all Panel members and full panel discussion carried out by telephone.

[2] PO Box 290, Broadway NSW 2007

2. Background

This Scheme has been driven by Accord for its members in recognition of the changing landscape in terms of environmental awareness in the purchasers and consumers of I&I products.

The purposes of the Scheme are as follows:

- To identify products with environmentally preferable characteristics,
- To provide reassurance to consumers regarding the claims made in relation to the product,
- To reward companies who are 'doing the right thing' – by providing a competitive advantage for environmentally advanced formulations,
- To be part of a journey for companies adopting more sustainable whole-of-business practices.

At this stage, the Scheme is exclusively for I&I products. However, it is possible that in the future the Scheme may be considered for other market spaces.

A wholly internal process would lack credibility therefore the incorporation of external validation and audit processes are integral to the Scheme.

3. Review findings

3.1 General

The Panel believes that the primary focus of the Scheme - on the potential environmental (largely aquatic) effects of the products - is entirely appropriate given the uses of these products. Potential human health effects are covered by existing public health and workplace regulations governing safe use. Human health effects are therefore not a focus of this Scheme. However, human health effects from environmental exposures (post use) to I&I products are considered in this Scheme (see comments on section 6.3 below).

The Panel notes that the criteria in Doc 1 assume proper use of product according to the product label and manufacturer's instructions. The Panel believes that it is beyond the scope of any Scheme such as this to account for all potential misuse scenarios, including accidental and intentional unregulated release to natural waterways.

The Panel recognises that the primary means by which these products enter the environment is via sewerage systems. In these cases, the toxicity of the product as a whole is likely to be the sum of the toxicities of the component ingredients and their degradation products. Toxicity in this case will be driven by the level of exposure to the environmental receiver and the 'dose' (concentration) of the product.

The Panel expects that the third party assessor will take dilution factors into account as part of the normal use profile of the product when assessing potential toxicity. These dilution factors would include the dilution of the concentrated product prior to use and subsequent dilution in the receiving environment (e.g. sewerage system or river).

The Panel believes that the Scheme as outlined in that Doc 1 takes a highly conservative approach for products that will eventually enter the sewage treatment process. However, the Panel also notes that in specific circumstances products may enter the environment directly; these cases need to be considered individually in light of the potential consequences in the specific environment, which will be driven by ingredient half-life and aquatic toxicity. The Panel recommends that Accord consider requiring companies accredited by this Scheme to commit to discussing with the user/purchaser the end-destination of the product and make a recommendation to the user/purchaser accordingly regarding its potential impact in that environment. The development of a logic tree would assist with this. Additionally, the Panel recommends that the third-party assessor be required to indicate those products that are unsuited for direct-release scenarios.

The Panel notes that Doc 1 (page 2, Section 2) states: *'It is assumed that the manufacturer or supplier complies with all relevant environmental and human health regulations (including labour, anti-discrimination and safety regulations) and such stipulation is not duplicated through this scheme'.*

However, the Panel recommends that companies accredited via this Scheme also guarantee their full compliance with national and State and Territory public health, workplace and environmental regulatory frameworks or standards.

The Panel also suggests that, in light of the focus of the Scheme being primarily on the potential effects of I&I cleaning products in aquatic environments, that the preferred logo for the Scheme (as identified during the presentation by Accord) be changed to include a water-related graphic as opposed to a plant-based graphic.

3.2 Detailed review

This section covers the Panel's assessment of Doc 1. Overall, the Panel concluded that the criteria for determining I&I products with environmentally preferable characteristics are sound and robust.

The Panel suggests that the Scheme documentation should contain a logic tree showing the logic behind the development of the evaluation scheme.

3.2.1 General principles (Doc 1, Section 6.1)

The Panel agrees with Section 6.1.1 (Product Performance) that products need to be fit for purpose and to meet Australian Standards where appropriate.

The Panel also agrees with Section 6.1.2 (Product Ingredient Disclosure) that the third-party assessor cannot evaluate the product against these criteria without full product formulation disclosure (need to be fully informed).

The Panel raised the issue of potential company non-disclosure of certain key ingredients and recommended that Accord provide for this contingency in the Scheme.

3.2.2 Environmental criteria (Doc 1, Section 6.2)

In assessing Section 6.2.1 (Product Concentration), the Panel noted that the effect of product from an environmental perspective is a result of several stages of dilution (initial dilution of product for use; additional dilution as enters waste; final dilution of discharged

waste to environmental waters). Additionally, the effect of the product also needs to consider the persistence of product ingredients in the process of normal use.

The Panel suggests that if arguments are to be made on the relative toxic effects of product concentrates *versus* diluted product, a whole-of-use assessment should be made. The hazards associated with the concentrate only translate into environmental risk when dilution and degradation are taken into account.

It is the Panel's view that the broad scheme for assessing ingredients in terms of toxicity, persistence and bioaccumulation potential (Section 6.2.2) is sensible and is based upon international best practice (US EPA 'Design for the Environment' scheme).

The Panel understands that the four cut-off levels specified in Doc 1, Table 1 are based upon existing values from the Globally Harmonised System (GHS)[3] for the environmental classification and labelling of chemicals, and supports this approach. The GHS represents current international best regulatory practice.

The Panel believes it to be preferable that product toxicity is assessed on the product as a whole at point of use, but where this information is not available, use of individual chemical acute toxicity data is appropriate. The Panel considers that these approaches are at the conservative end of the environmental assessment spectrum since additional dilution and possible degradation of the product will occur before the product reaches the receiving environment. The Panel expects the third-party assessor to have suitable expertise in recognising where potential non-additive ingredient effects are occurring.

The Panel makes the following more specific comments on Table 1:

- The toxicity units should be changed from 'ppm' to mg L^{-1}.
- The Panel agrees with the use of bioaccumulation data, noting that there is little data available for bio-concentration of chemicals. However, we urge that any other available and relevant information relating to environmental impacts be considered in the assessment.
- The Panel notes that the Scheme requires the use of acute aquatic toxicity data (Table 1). Given the general lack of adequate chronic toxicity data, the Panel concludes that use of acute toxicity data is appropriate for situations when the product will end up in a sewerage system, and where multiple dilutions will also occur. However where the product is discharged to a natural waterway special investigation should be required. The Panel refers to their recommendations under Section 3.1 that companies accredited by this Scheme commit to discussing with the user/purchaser the anticipated end-destination of the product, and that the third-party assessor be required to indicate products unsuited to direct-release to the environment after use.
- Regarding Note 4 to Table 1, the Panel recommends that neither option 1 nor 2 be prescribed, but that the expertise of the third-party assessor be relied upon to make the decision regarding the acceptability of data sets for products containing ingredients with

[3] http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html; http://www.safeworkaustralia.gov.au/SafetyInYourWorkplace/HazardousSubstancesAndDangerousGoods/GHS/Pages/GHS.aspx

aquatic toxicity $\leq$1 mg L^{-1}. The Panel again notes the highly conservative nature of the criteria for products entering the sewerage system.

- The Panel agrees that for ingredients for which the K_{OW} is not an appropriate measure, for example surfactants, bioaccumulation potential is not required. This needs to be considered on a case-by-case basis.

The Panel agrees with the hierarchy of data preferences noting that Annex 1 specifies recognised tests for toxicity, persistence and bioaccumulation. The Panel recommends that in situations where chronic data is available, this should be used in preference to acute data.

The Panel agrees with the statement in Doc 1, Section 6.2.3 (Dyes and colorants), and supports the stipulation that minimum amounts of dye or colorant be used. The Panel further recommends that a specific statement be made regarding heavy metals in that manufacturers should specify that they are not present in the feedstocks.

The Panel agrees that the assessment of VOCs (Doc 1, Section 6.2.4) be determined in the product concentrate and not in the in-use product.

The Panel recognises the potential issues associated with introduction of phosphorus as a nutrient into the environment and the media attention attracted by these issues and agrees that a consideration of nutrients should be included in the Scheme (Doc 1, Section 6.2.5 Phosphorus). The Panel believes that the absolute 'no phosphorus' claim will be difficult to justify and recommends that Accord consider different terminology for products in which very low amounts ($\leq$0.5%) of phosphorus may be incidentally present.

The Panel also considered whether nitrogen – another important nutrient – be addressed in these criteria. The Panel concludes that nitrogen should not be introduced as an additional criterion because the process of wastewater treatment is highly effective at removing nitrogen.

The Panel agrees with the statement in Doc 1, Section 6.2.6 regarding sodium, but recommends changing the Rationale to only specify the ubiquitous nature of sodium in the environment.

Regarding Section 6.2.7 (Plant *vs* Animal *vs* Petrochemical-based raw materials), the Panel does not see the need for this criterion in this product-based Scheme, but considers that it may be included in a whole-of-business sustainability approach as it relates to environmental ethics.

The Panel agrees with the statement at Section 6.2.8 regarding ozone-depleting compounds.

The Panel believes that consideration of packaging (Doc 1, Section 6.2.9) is outside their Terms of Reference and additionally is a commercial decision, but agrees that recyclable packaging would be advantageous.

The Panel considered whether there are any additional environmental criteria that should be included, and concludes that there are not.

3.2.3 Human health criteria (Doc 1, Section 6.3)

The Panel recommends that the whole of Section 6.3 be removed from the main section of this document and included as an Appendix indicating that these issues have been considered but are regulated elsewhere. The Panel notes that potential human health effects

for direct users of the products are covered by existing workplace regulations governing safe use. Human health effects therefore do not form a primary focus of this Scheme. The same is true for public health standards governing safe access and use, as this Scheme applies to industrial and institutional uses and not general consumer use.

Therefore, the Panel recommends that the focus of human health criteria should not be direct users of the products but on human exposure to the chemical via the environment. The Panel notes that the main risk is for chemicals that are of low ecotoxicity but of high human/mammalian toxicity, and where toxicity occurs at very low to extremely low exposures. The Panel considers that for the most common scenario - discharge from sewage treatment plants into marine environments and potential concentration up the food chain – the environmental criteria proposed in Doc 1 (and particularly Table 1) cover persistence and bioaccumulation, and therefore mitigate risk via this pathway.

Finally, the Panel believes that the issue of industry moving to less toxic chemicals is one that goes to ethical business and sustainability matters and should be encouraged by Accord and the industry generally. Therefore, the Panel believes that the approach of Doc 1 Section 6.3 prohibiting or restricting substances with potentially serious or irreversible human health effects, including toxic and CMR substances, is sensible.

4. Accreditation process

While not directly in their Terms of Reference, the Panel considers that a sound and transparent accreditation process is vital to the credibility of this Scheme. External evaluation provides a platform for industry, users and the public to have full confidence in the reliability of the assessment process.

The Panel understands that this will be a largely web-based process and is supportive of this approach.

The Panel believes that it is in the interests of all involved if the assessment process occurs as expediently as possible.

The Panel believes the essential skills set required by the third-party assessor to be:

- independence – that is has no pecuniary interest in the products being assessed,
- skills in toxicology, ecotoxicology and environmental toxicology,
- currency of knowledge regarding the products being assessed,
- risk assessment skills – as a platform for appropriate use of datasets,
- external accreditation of members of the company (eg. DABT).

The Panel supports the governance cycle as outlined in the Figure in Doc 2.

The Panel also noted that the annual probity audit will provide confidence that the process is robust and independent, and free from any potential influence by Accord.

The Panel is highly supportive of the assessment decision tree (Doc 2, Fig. 5.15). The Panel believes that the presence of iterative loops within the process between assessor and companies is useful for informing both parties, and in maintaining the externality of Accord to the decision. However, the Panel also suggests that the decision tree could be improved with

inclusion of greater specification of the filtering/gating mechanism (to exclude products at different stages of the assessment process), and recommends that the third-party assessor develop these improvements.

The Panel emphasises the need for mandatory notification by the company of any change to formulation, and not just 'significant' changes as noted in Figure 5.15 because the latter would place an unnecessary and inappropriate burden on companies to decide what is 'significant'.

The Panel believes that reaccreditation should occur in a 3 to 5 year cycle, with the third-party assessor recommending the period after which reaccreditation should occur based on the original application and any new toxicological information. There should also be the flexibility to re-assess products when new information challenges the validity of the initial assessment.

5. Conclusions and recommendations

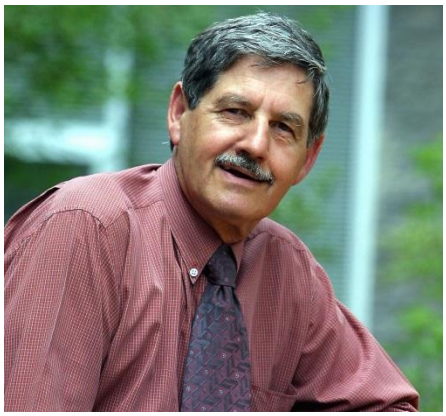
The Panel considers that the Scheme and its management is a worthwhile endeavour, which proactively places the industry on the front foot with regard to concerns about the safety of the environment and ethical business practice. It challenges companies to aspire to improved environmental credentials and carries with it inherent adoption of world best practice in sustainability and environmental management. The evidence-based and independent third-party assessment is robust and should meet environmental audit requirements.

The Panel recommends that:

1. The Scheme documentation should contain a logic tree showing the logic behind the development of the evaluation scheme.
2. Companies accredited by this Scheme commit to discussing with the user or purchaser of their products the end destination of the product and make a recommendation to the user or purchaser accordingly regarding its potential impact in that environment.
3. The third-party assessor should indicate products that are unsuited to direct-release scenarios.
4. Companies accredited via this Scheme should guarantee their full compliance with national and State and Territory public health, workplace and environmental regulatory frameworks and /or standards.
5. Accord provide contingency action for potential company non-disclosure of certain key ingredients in the Scheme.
6. A whole-of-use assessment should be made in considering the relative toxic effects of product concentrates *versus* diluted product.
7. Product toxicity should be assessed on the product as a whole at point of use, and where this information is not available, use of individual chemical acute toxicity data is appropriate.
8. A specific statement should be made regarding heavy metals with manufacturers required to specify that they are not present in the feedstocks used in the I&I products.

9. Neither option 1 nor 2 in Note 4 to Table 1 be adopted, but that the expertise of the third-party assessor be relied upon to make the decision regarding the acceptability of data sets relating to products containing ingredients with aquatic toxicity $\leq$1 mg L^{-1}.
10. Accord consider using terminology different to 'no phosphorus' for products in which very low amounts ($\leq$0.5%) of phosphorus may be incidentally present.
11. In Section 6.2.6 (sodium), the Rationale be changed to only specify the ubiquitous nature of sodium in the environment.
12. The whole of Section 6.3 be removed from the main section of this document and included as an Appendix indicating that these issues have been considered and are regulated elsewhere.
13. The focus of human health criteria should be on human exposure to the chemical via the environment and not direct users of the products.
14. The focus on ethical and sustainable business practices that prohibit or restrict substances with potentially serious or irreversible human health effects, (including CMR substances) in I&I products is sensible.
15. The assessment decision tree could be improved with the inclusion of greater specification of the filtering/gating mechanism (to exclude products at different stages of the assessment process) - the third-party assessor could develop these improvements.
16. Re-accreditation should occur on a 3 to 5 year cycle, with the third-party assessor recommending the period after which reaccreditation of particular products should occur.

Professor Barry T Hart - Biography



Professor Barry Hart is Director of environmental consulting company – Water Science Pty Ltd, established after he retired from Monash University. He has been appointed an Emeritus Professor by Monash University. Previously he was Director of the Water Studies Centre at Monash University and Deputy Director Research of the CRC for Freshwater Ecology.

Professor Hart has established an international reputation in the fields of ecological risk assessment, environmental flow decision-making (particularly using Bayesian Network models), water quality and catchment management and environmental chemistry (heavy metal and nutrient biogeochemistry). He has published over 175 refereed papers and 12 books, and is on the editorial board of 5 international journals. He has received several awards, including the Limnology Medal (1982) from the Australian Society for Limnology, the Environmental Chemistry Medal (1996) and Applied Chemistry Medal (1998) from the Royal Australian Chemical Institute, and in 2003 a Centenary Medal for services to water quality management and environmental protection.

He is well known for his sustained efforts in developing knowledge-based decision making processes in natural resource management in Australia and south-east Asia (particularly with the Mekong River Commission). Currently, he is involved in projects in China and PNG.

Professor Hart is currently a member of the Murray Darling Basin Authority and President and Board Chair of Greening Australia (Victoria). He also chairs the Commonwealth Environmental Water Scientific Advisory Committee, Gippsland Lakes & Catchment Taskforce, Science Advisory Committee for the Victorian Strategy on Healthy Rivers, Estuaries and Wetlands (VSHREW), DSEs Environmental Flows Technical Audit Panel, Melbourne Water's Waterways Advisory Committee, and the Fitzroy River Basin Scientific Advisory Committee. He has recently been appointed to the External Stakeholder Advisory Panel (ESAP) for the Hidden Valley gold mine in PNG.

Previously, he was a member of the Victorian Environment Assessment Council, the Scientific Reference Committee for the Victorian Government's Land & Biodiversity White Paper, the Expert Advisory Taskforce for the Victorian White Paper (Securing Our Water Future Together), the Victorian Environment Protection Authority Board, the Victorian Catchment Management Council, the Great Barrier Reef Water Quality Partnership Science Advisory Panel, EPA Victoria's Science Futures Panel, Yarra Coordinating Committee, the Alligator Rivers Region Technical Committee and the Gippsland Integrated Natural Resources Forum. He has recently completed 5 years as Technical Advisor to PEAK an independent Advisory Committee overseeing the sustainability of the Porgera Gold mine in PNG.

For more detail see – www.waterscience.com.au

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MICHAEL R. MOORE

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Michael is a registered Toxicologist, (British Toxicological Society, Eurotox & Institute of Biology) and founder Member and Registrar of the Australasian College of Toxicology and Risk Assessment (ACTRA). He is chair of the board of Water Quality Research Australia. (WQRA) and holds the positions of: Honorary Professor, 'smartWater', Griffith University; Emeritus Professor at the University of Queensland; Adjunct Professor in Queensland University of Technology (Research Affiliate in the Centre for Research Excellence in Sun & Health): and Adjunct Professor in the Faculty of Science, Sunshine Coast University.

He gained a PhD in Medicine and was awarded a Doctorate in Science in the field of Biochemistry in Medicine. He trained in Clinical Pharmacology in the Royal Postgraduate Medical School in London and was a foundation director of the Australian Centres for Human Health Risk Assessment. He was Director of Queensland Health Scientific Services and worked previously in the University of Glasgow, where he was Reader in Medicine and Therapeutics contemporaneously being a Director of Monklands and Bellshill NHS Hospital Trust in Scotland and Justice of the Peace in Cumbernauld and Kilsyth. He has written several books, numerous book chapters and over 500 refereed research publications.

His fields of interest include the toxicology of metals, risk assessment, water quality, air quality, cyanobacterial toxins and disorders of porphyrin metabolism.

BRIEF BIOGRAPHY: DR MARGARET HARTLEY

Margaret Hartley has been Chief Executive Officer of the Australian Academy of Technological Sciences and Engineering (ATSE) since January 2009. She leads the Academy in delivering its strategic goals of driving technological science and engineering solutions to key problems facing Australia today.

Dr Hartley's background in regulatory toxicology and population health policy and epidemiology has led to an extensive career with the Australian Government prior to joining ATSE. Her responsibilities have included Principal Scientific Adviser to the Australian Government Department of Health and Ageing, Director of the Office of Chemical Safety, and nine years as Australia's Chemical Regulator, leading and managing risk assessment of chemicals and cosmetics. She was also an expert advisor to the Government on chemical security and chemical diversion control regulations.

Margaret is an advisor to the World Health Organization and chaired the Harmonisation of Chemicals Risk Assessment Methodologies Project. She has represented the Australian Government at the WHO, OECD, UNEP, APEC and in establishing bilateral regulatory cooperative arrangements between Australia and Canada, NZ and the USA. She has served on many regulatory and advisory committees in Australia and overseas including the National Drugs and Poisons Scheduling Committee and the UK Health Protection Agency's Scientific Advisory Group of the Global Health Protection Forum.