



ChemCentre Response to DWER Issues Paper

Waste not, want not: valuing waste as a resource

ChemCentre appreciates the opportunity to make a submission to the DWER Issues paper and welcomes all queries that may be raised from the items listed below.

Background

Legislative framework for waste-derived materials

The Department of Water and Environmental Regulation is seeking public comments on potential waste legislation reforms in Western Australia and has released an issues paper.

The issues paper outlines possible reforms to support use of waste-derived materials and encourage the use of fit-for-purpose waste-derived materials and WA's move to a circular economy.

The reforms aim to provide greater certainty about when waste-derived materials will trigger licensing and levy obligations.

About ChemCentre

Established in 1890, ChemCentre is Western Australia's leading chemical and forensic science service provider. We play a key role in matters of public and environmental health, justice, safety and security and provide high quality, independent chemical information, applied research, expert opinions, advice, investigative support and complex analytical services to government agencies, industry and research groups. We apply technical knowledge to practical problems to achieve effective outcomes for communities, government, and industry. These unique skills have created an organisation with an uncompromising attitude to quality and our experience in providing qualitative and quantitative data can stand up to legal scrutiny and assist government in addressing regulatory issues.

Importance of expert input to the process

Science is at the heart of decisions around the use of waste as a resource. ChemCentre scientists have been involved in studies of waste material ranging from compost to pyritic shale and over the years have undertaken research funded by industry, MRIWA and CRC CARE (Cooperative Research Centre for Contamination Assessment and Remediation of the Environment). These studies include the LEAF protocol which will be discussed in full later, but also defining new standards for compost to increase market potential, the potential use and management of landfill bioreactor systems and investigations relating to acid generation formation in the Pilbara.

ChemCentre contends that it is important to have the ability to investigate the specifics of a waste and the intended use, to add greater flexibility to a legislated process. The legislation

will need to have a definition of a “safe material” and chemical investigation is an important means of determining the nature of the waste derived material.

Understanding of the effects of chemicals on the environment can evolve over time. For instance, PFAS and other components of fire-fighting foams are now identified as a concern in the environment. The involvement of experts in the design and interpretation of studies is essential.

Testing of waste material to establish suitability for reuse (LEAF)

The LEAF approach is a powerful means to establish the suitability of waste material for reuse in the natural environment. ChemCentre has practical and theoretical expertise in the LEAF protocol and has used it to assess the potential to beneficially reuse industrial waste materials.

The US EPA describes the [Leaching Environmental Assessment Framework](#) (LEAF):

The Leaching Environmental Assessment Framework (LEAF) is a leaching evaluation system, which consists of four leaching methods, data management tools, and scenario assessment approaches designed to work individually or to be integrated to provide a description of the release of inorganic constituents of potential concern (COPCs) for a wide range of solid materials. The LEAF Methods have been designed to consider the effect of key environmental conditions and waste properties on leaching.

The US EPA discusses the benefit of this framework (*LEAF 1313, LEAF 1314, LEAF 1315 and LEAF 1316*) in relation to beneficial use of materials.

LEAF may be useful in estimating the environmental impacts from utilization of secondary materials, primarily as construction materials. Leaching data from LEAF or other relevant leaching tests can be used in EPA’s [Methodology for Evaluating Beneficial Uses of Industrial Non-Hazardous Secondary Materials](#), which presents a voluntary approach for evaluating potential adverse impacts to human health and the environment from a wide range of industrial non-hazardous secondary materials and their associated beneficial uses.

ChemCentre noted in its response to the DWER Consultation Paper “Environmental Protection Regulations 1987” and DWER Request for Submissions – “Review of Thresholds for Uncontaminated Fill”, that protocols such as the Australian Standard Leach Procedure (AS4439) are deficient. The main limitation of the ASLP is that it only provides leaching data for one pH value chosen out of two or three, and therefore may not provide rigorous information on the long-term leaching behaviour of the material. Additionally, the tests are biased for acidic conditions which may give conservative values for constituents present as cations in solution, and which also may underestimate the concentrations of anionic substances under neutral to alkaline pH conditions as occurs in Western Australian soils. Leaching tests need to be done under the full range of pH conditions that waste materials experience to provide a higher level of confidence in predicting contaminants in leachate. Other limitations of the current ASLP test are A) it does not consider how the concentrations of constituents in leachate will vary as the liquid to solid ratio changes and B) it provides no information about the release rate of constituents from solid wastes. This information would be required to determine the mass flux of contaminants that could be leached from solid waste materials into the environment.

ChemCentre has been actively working with DWER, MRIWA, DBCA and industry on validating the LEAF protocol for Western Australian conditions. We have recently completed a MRIWA and industry funded project, “Establishing Leaching Environmental Impact Assessment Tools

in the Development of a WA Framework for By-product Re-use and Classification”, that will better inform the development of LEAF guidelines and frameworks for re-use and classification of waste derived materials. Further information can be found on the [ChemCentre website](#).

Policy Framework

Chemcentre believes that the legislative response could be best informed by the outcomes from the end-of-waste framework developed in 2014 by the former Department of Environmental Regulation. The framework includes a series of guidance documents and environmental standard as listed on pages 8 and 9 of the issues paper under discussion.

In our submission to the Application for the use of waste-derived materials (case-by-case determination), ChemCentre commented:

ChemCentre regards this initiative as a significant step forward in ensuring the safe use of waste-derived materials to benefit the environment, improve agricultural productivity and divert potentially useful materials from increasingly scarce and costly landfill.

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