Report

WASTE AUTHORITY OF WESTERN AUSTRALIA

REVIEW OF THE REGULATORY FRAMEWORK FOR THE MANAGEMENT OF CONSTRUCTION AND DEMOLITION AND INERT WASTE IN AUSTRALIAN JURISDICTIONS

November 2011

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18 November 2011

Mr Peter Fitzpatrick
Chair
Waste Authority of Western Australia
Locked Bag 104
BENTLEY DELIVERY CENTRE WA 6983

Dear Mr Fitzpatrick,

Re: Review of the Regulatory Framework for the Management of Construction and Demolition and Inert Waste in Australian Jurisdictions

We are pleased to submit this report presenting our review of legislation and practices for the management of construction and demolition and inert wastes across all Australian jurisdictions.

Should you wish to discuss any matters concerning this report please do not hesitate to contact Ms Alison McRae or Dr Julie Moriarty 03 9690 0522.

Yours sincerely,

PJRamsay.

Peter J Ramsay & Associates

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USE OF REPORT

The preparation of this report has been undertaken for the purpose of providing a review of the regulation of the use and disposal of Construction and Demolition waste, inert waste and asbestos waste, and the application of a landfill levy in Australian jurisdictions on behalf of the Western Australian Waste Authority and this report cannot be used for any other purpose.

This report is prepared solely for the benefit of the Waste Authority. This report is provided on the condition that it or any part of it, will not be made available to, or relied upon by any other party for any purpose except with the prior written consent of Peter J Ramsay & Associates Pty Ltd (which consent may or may not be given at its discretion). Peter J Ramsay & Associates Pty Ltd consents to the Waste Authority making this report available to other parties for the purpose of showing the scope of, and the recommendations provided in, this report, however those third parties cannot rely on the contents of this report.

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EXECUTIVE SUMMARY

Peter J Ramsay & Associates was engaged by the Western Australian (WA) Department of Environment and Conservation (DEC), on behalf of the Waste Authority, to review the regulation of the use and disposal of Construction and Demolition (C&D) waste, inert waste and asbestos waste, and the application of landfill levies in Australian jurisdictions.

The purpose of this review is to assist the WA Government in understanding how the current regulatory framework for the use of C&D waste, inert waste, clean fill and Virgin Excavated Natural Materials (VENM) in WA compares with other jurisdictions in Australia. The review also examines how the landfill levy is applied across jurisdictions, and how waste asbestos is regulated and managed.

The approach to the review involved examining state or territory legislation and guidelines, reviewing state or territory strategic and implementation plans, reviewing supporting documentation relevant to waste management practices, and clarifying legislation and guidelines with the relevant regulatory body for that jurisdiction.

In all Australian jurisdictions, the overarching legislation regarding waste management and practices was found to be similar: all jurisdictions consider that the disposal of waste to land has the potential to cause environmental harm, all have special management and disposal practices for waste asbestos, and almost all jurisdictions use the imposition of a landfill levy as an economic instrument to drive waste avoidance. However, the details and implementation of the legislation, including definitions and classification, vary widely between jurisdictions.

As an example, fill material (uncontaminated soil) has various definitions and waste classifications throughout Australia. In New South Wales (NSW) fill material is termed VENM, and is classified as a waste for reporting and disposal purposes. However, in Queensland fill material is termed Clean Earth which is not considered a waste, and consequently is disposed of as fill material and is not regulated or reported.

Disposal of waste is also regulated slightly differently between jurisdictions. Victoria and South Australia (SA) consider all disposal of waste to land as environmentally significant, whereas the Australian Capital Territory (ACT) considers it environmentally significant only when waste is disposed to land at a rate in excess of 5 000 tonnes per year. In contrast, NSW does not regulate the disposal of C&D waste and/or VENM to land if the waste is generated and disposed of outside the regulated area of NSW, and disposal is less than 20,000 tonnes per annum.

There are also differences between jurisdictions in how a waste disposal levy is imposed. NSW, Victoria, SA, WA and the ACT all have waste disposal levies, although the ACT levy is not administered through its environmental agency and only applies to commercial and asbestos waste. Queensland is proposing to introduce an environmental levy on 1 December 2011, but this levy will not apply to municipal solid waste and asbestos. There is a minimal levy in Tasmania which is administered by local authorities, and in the Northern Territory there is a levy which only applies to waste tyres in certain local government areas. Furthermore, NSW and SA have a flat rate for all waste types, but the levy varies by locality, whereas Victoria has a landfill levy which varies by both waste type and locality.

There are also differences in the regulation of C&D waste end uses across jurisdictions. For example, the end use of C&D waste is highly regulated and prescriptive in NSW, whereas the regulation of such activities in Victoria is not, and Victorian legislation relates primarily to prescribed industrial wastes. Specifically, NSW requires exemptions for the end use of C&D waste, whereas Victoria relies only on contractual agreements between the contractor and the recycler to ensure that the product meets engineering specifications. For example, NSW has a general exemption for aggregate derived from C&D waste to be used as road base, whereas Victoria relies on contractual agreements with VicRoads to ensure that the road base meets engineering specifications. In other jurisdictions, some activities relating to the recycling of C&D wastes are regulated, but in most circumstances the end uses are not regulated by the environmental agency.

In all jurisdictions, waste asbestos has special disposal requirements, and recycling/reuse of waste asbestos is considered illegal. Asbestos waste is leviable in all jurisdictions except Tasmania, the Northern Territory and Queensland.

LIST OF ABBREVIATIONS

ACM	Asbestos Containing Material
ACT	Australian Capital Territory
ANZECC	Australian and New Zealand Environment and Conservation Council
AOP	Approved Operational Purpose
ASS	Acid Sulphate Soils
C&D	Construction and Demolition
C&I	Commercial and Industrial
CCA	Copper Chrome Arsenate
COAG	Council of Australian Governments
CPI	Consumer Price Index
DEC	Western Australia Department of Environment and Conservation
DECCEW	Australian Capital Territory Department of Environment, Climate Change, Energy and Water
DERM	Queensland Department of Environment and Resource Management
DPIPWE	Tasmania Department of Primary Industries, Parks, Water and the Environment
DSP	Dredging Spoil
ENM	Excavated Natural Material
EMPC Act	*Environmental Management and Pollution Control Act* 1994 (Tasmania)
EMPCWM Regulations	Environmental Management and Pollution Control (Waste Management) Regulations 2010 (Tasmania)
EPA	Environmental Protection Authority
EP Act 1997	*Environment Protection Act* 1997 (ACT)
EP Act 1993	*Environment Protection Act* 1993 (SA)
EP Act 1994	*Environmental Protection Act* 1994 (Queensland)
EP Act 1970	*Environment Protection Act* 1970 (Victoria)
EP Act 1986	*Environmental Protection Act* 1986 (Western Australia)
EP Regulation 2008	Environmental Protection Regulation 2008 (Queensland)
EP Regulations 2009	Environment Protection Regulations 2009 (SA)

EP Regulations 1987	Environmental Protection Regulations 1987 (WA)
EPHC	Environment Protection and Heritage Council
EPL	Environment Protection Licence
EPSPE Regulations	Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Victoria)
EPWM Policy	Environmental Protection Waste Management Policy 2000 (Queensland)
EPWM Regulation	Environmental Protection Waste Management Regulation 2000 (Queensland)
ERA	Environmentally Relevant Activity
GPS	Global Positioning Satellite
HDPE	High Density Polyethylene
HTC	High Temperature Creosote
IPWEA	Institute of Public Works Engineering Australia
IWRG	Industrial Waste Resource Guidelines
IWRP	Industry Waste Reduction Plan
LOSP	Light Organic Solvent Preservative
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
MW	Megawatts
MWARR	Metropolitan Waste and Resource Recovery (Melbourne)
NEPM	National Environment Pollution Measure
NRETAS	Department of Natural Resources, Environment, The Arts and Sport (NT)
NSW	New South Wales
NT	Northern Territory
OEH	NSW Office of Environment and Heritage
PASS	Potential Acid Sulphate Soils
PEC	Pigmented Emulsified Creosote
PET	Polyethylene Terephthalate
PIW	Prescribed Industrial Waste

POEO Act	*Protection of the Environment Operations Act* 1997 (NSW)
POEO (Waste) Regulation	Protection of the Environment Operations (Waste) Regulation 2005 (NSW)
RCG	Recycled Crushed Glass
RDF	Refuse Derived Fuel
RPP	Recovered Products Plan
SA	South Australia
SA EPA	South Australian Environment Protection Authority
SEPP	State Environment Protection Policy
TAMS	Department of Territory and Municipal Services
TZW	Towards Zero Waste Strategy (Victoria)
VENM	Virgin Excavated Natural Material
VIC EPA	Victorian Environment Protection Authority
W2REPP	Environment Protection (Waste to Resources) Policy 2010 (SA)
WA	Western Australia
WARR Act 2001	*Waste Avoidance and Resource Recovery Act* 2001 (NSW)
WARR Act 2007	*Waste Avoidance and Resource Recovery Act* 2007 (WA)
WARR Regulation	Waste Avoidance and Resource Recovery Regulations 2008 (WA)
WARR Strategy	Waste Avoidance and Resource Recovery Strategy (NSW)
WRAR Act	*Waste Reduction and Recycling Act* 2011 (Queensland)
WRAR Strategy	Waste Reduction and Recycling Strategy 2010-2020 (Queensland)
WaSIP	Waste Sustainability Improvement Payment
WDF	Waste Derived Fill
WM Act	*Waste Minimisation Act* 2001 (ACT)
WMP	Waste Management Policy
WMPCA Act	*Waste Management and Pollution Control* Act 2009 (NT)
WMPCA Regulation	Waste Management and Pollution Control (Administration) Regulations 2010
WRAPP	Waste Reduction and Purchasing Policy (NSW)

1. INTRODUCTION

On 27 September 2011, Peter J Ramsay & Associates was engaged by the Western Australian (WA) Department of Environment and Conservation on behalf of the Waste Authority, to review the regulations regarding the use and disposal of Construction & Demolition (C&D) and inert waste, and the application of a landfill levy to C&D and inert waste in Australian jurisdictions.

The purpose of this review is to help the Western Australian Government understand how the current regulatory framework for the use of C&D waste, inert waste, clean fill and Virgin Excavated Natural Materials (VENM) in Western Australia compares with other jurisdictions in Australia. The review will also show how the landfill levy is applied across jurisdictions, and how waste asbestos is regulated and managed.

2. BACKGROUND

Waste management practices refer to how waste is classified and collected, how waste is disposed of or reused, and how waste is managed as a resource.

Under the Australian Constitution, waste management practices in Australia are primarily the responsibility of the respective state or territory. In recent times, there has been an effort to co-ordinate waste management practices across the eight jurisdictions of Australia (New South Wales, Victoria, South Australia, Western Australia, Queensland, Tasmania, the Australian Capital Territory and the Northern Territory) through the National Waste Policy (2009), which was developed by the Environment Protection and Heritage Council (EPHC). This national policy was later accompanied by a supporting implementation plan in July 2010. The National Waste Policy was endorsed by the council of Australian Governments (COAG) on 5 November 2009.

The regulatory framework, principles and practices across Australian jurisdictions have some similarities. All are based on key higher level environmental protection acts, which are supported by regulations. Many jurisdictions also have secondary acts, with objectives to promote waste minimisation and resource recovery. Underpinning these acts is the waste hierarchy which encourages waste minimisation and avoidance, followed by reuse then recycling, and lastly disposal. Strategic plans in each jurisdiction to support these principles have been developed under the umbrella of the National Waste Policy.

Despite efforts to co-ordinate waste management practices between the eight jurisdictions in Australia, differences still occur in waste classification and reporting, waste tracking, the imposition of waste levies, the setting of waste targets, waste management methodologies, and the permissible end use of specific waste streams. Mechanisms to support waste management (e.g. financial incentives, stewardship) also differ between jurisdictions.

Regulations regarding the categorisation of waste streams are an important factor in understanding the management practices across jurisdictions. As an example, the C&D waste stream may comprise large quantities of fill material, and therefore how the jurisdiction classifies fill material will have a significant impact on the landfill disposal rates in that jurisdiction.

Landfill disposal levies also have a significant impact on disposal rates, and are a key economic instrument used by many jurisdictions to drive waste avoidance. The levy also encourages the resource recovery sector by making resource recovery alternatives more viable.

3. SCOPE

The scope of the review was to:

- Research and review how C&D waste, inert waste, clean fill, waste asbestos and VENM is defined and categorised in each Australian jurisdiction;
- Research and review permissible end uses for C&D waste, products from processed C&D waste, inert waste, clean fill and VENM in each Australian jurisdiction;
- Research and review if and how the collection, processing, recycling and disposal of C&D waste is regulated in each Australian jurisdiction; and
- Research and review if and how a landfill levy is applied (or exempted) for different categories of waste, including C&D waste, inert waste, clean fill, asbestos and VENM.

4. AUSTRALIAN CAPITAL TERRITORY

4.1 Legislative Approach

The Australian Capital Territory (ACT) Department of Environment, Climate Change, Energy and Water (DECCEW) administers the waste regulatory framework through the ACT's primary environment protection legislation, the *Environment Protection Act* 1997 (the EP Act 1997). This act is supported by the Environment Protection Regulation 2005. The key subordinate legislation for waste management is the *Waste Minimisation Act* 2001 (the WM Act) which provides the framework for waste minimisation and reuse, in accordance with the waste hierarchy. The WM Act enables the environmental management authority to instigate industry waste reduction plans (IWRPs) which are intended to support specific industries to meet territory wide waste minimisation targets. Supporting legislation for the WM Act is the Waste Minimisation Regulation 2001.

The ACT Government sustainable waste strategy 2010-2025 sets targets to minimise waste. This strategy is implemented by ACTNOWaste, which is a business unit of the ACT Government Department of Territory and Municipal Services (TAMS). ACTNOWaste also encourages the resource recovery industry to maximise the recovery and recycling of wastes in the ACT and surrounding regions. Other responsibilities include management of waste acceptance and disposal facilities.

4.2 Definition and Categorisation of Waste

According to the ACT publication *Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes* June 2000, DECCEW categorises non-liquid waste into four categories on a risk basis according to the risk that the disposed waste will have on the environment. These four categories are listed in descending order of hazard as:

- Hazardous waste;
- Industrial waste;
- Solid waste; and
- Inert waste.

Hazardous waste poses the greatest risk to the environment and requires treatment prior to disposal. Industrial waste poses a lesser risk, and has special disposal requirements. Solid waste, such as putrescible waste from the Municipal Solid Waste (MSW) stream requires some care in disposal due to the potential for landfill gas generation and leachate discharge. Inert waste is the waste least likely to pose a threat to the environment.

Table 1 indicates how the ACT defines and categorises C&D waste, inert waste, VENM, clean fill and waste asbestos.

Table 1 Waste Type Classifications in the ACT

Waste Type	Classification
C&D Waste The ACT publication *Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes* June 2000 defines construction and demolition waste as "Building and demolition waste (e.g. bricks, concrete, paper, plastics, glass, metal and timber), being material resulting from the demolition, erection, construction, refurbishment or alteration of buildings or from the construction, repair or alteration of infrastructure-type development such as roads, bridges, dams, tunnels, railways and airports, and which: (a) is not mixed with any other type of waste, and (b) does not contain any asbestos waste."	Inert
Inert Waste The ACT publication *Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes* June 2000 defines inert waste as the "waste type [which] is the least likely to undergo environmentally significant transformations; therefore, it should not release significant quantities of greenhouse gases or leachates contaminated with nutrients and/or chemicals". Inert waste includes: • VENM; • C&D waste; • Asphalt; • Used tyres; • Biosolids; and • Office and packaging waste.	Inert
Clean Fill The ACT does not use the term 'clean fill'.	N/A
Waste Asbestos The ACT publication *Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes* June 2000 defines asbestos as "a generic name for a group of naturally occurring mineral silicates of the amphibole or serpentine series that are characterised by fibres or bundles of fine single crystal fibrils. Naturally occurring asbestos fibres typically have length-to-width ratios of the order of 100 or higher. Included in the definition are the following minerals: chrysotile, crocidolite, amosite, anthophyllite, tremolite and actinolite." Asbestos waste is defined as "any waste that contains asbestos as defined in these standards." Stabilised asbestos waste in bonded matrix, and asbestos fibre and dust waste (e.g. waste resulting from the removal of thermal or acoustic insulating materials or from processes involving asbestos material, and dust from ventilation collection systems) are considered industrial waste.	Industrial
VENM According to the ACT publication *Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes* June 2000, VENM is "virgin excavated natural material (e.g. clay, gravel, sand, soil and rock) that is not mixed with any other waste and that: (a) has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphidic ores or soils, or (b) consists of excavated natural materials that meet such criteria as may be approved by the Environment Management Authority.	Inert

4.3 Regulation of Construction and Demolition Waste

The ACT regulates those activities which are deemed to pose substantial environmental risk. These activities are listed in Schedule 1 of the EP Act 1997 as either class A or class B activities, where Class A activities have greater risk of harm to the environment, and hence involve a higher level of regulation. Under Section 42 of the EP Act 1997, a person must not conduct an activity listed in Schedule 1 as a Class A activity or a class B activity unless the person holds an environmental authorisation in relation to that activity.

Activities relevant to the C&D industry which require environmental authorisations include:

- The operation of a commercial landfill facility that receives, or is intended by the operator to receive, more than 5 000 tonnes of waste per year; and
- The operation of a facility for the crushing, grinding or separating of materials (including sand, gravel, rock, minerals, slag, road base, concrete, bricks, tiles, asphaltic material, metal or timber) into different sizes, if the processing facility is designed to produce more than 10,000 tonnes of processed materials per year.

ACTNOWaste requires that a Waste Management Plan be included as part of the building approvals process involving the demolition of any building, or alteration/refurbishment of a building, depending on the type of building, ad extent of demolition. A Waste Management Plan must include information about the:

- Extent of the demolition work to be undertaken;
- The type and amount of waste that will be generated by the demolition; and
- The location to which the waste will be taken for reuse, recycling or disposal.

4.4 Permissible End Uses and Products

According to the ACT publication *Sustainable Waste Strategy 2010-2025 (Draft)*, the ACT recovered an estimated 90% of the construction and demolition waste stream in 2008–09. The primary driver for the high recycling rate has been the high landfill disposal fees, and the numerous Material Recovery Facilities (MRFs) which work closely with the C&D industry, and specialise in the sorting of construction and demolition waste into valuable resource streams for use locally (building and road construction) and regionally.

In the ACT, there are no regulations regarding end uses of recycled waste; however the end uses need to comply with relevant engineering specifications to demonstrate that the product can meet design requirements. The latter environmental activity discussed in 4.3, for production of aggregates, suggest that the reuse of C&D waste as aggregates, subject to the conditions of the environmental authorisation, is permissible.

This end use, and other end uses for C&D wastes, which are known to be permissible since they are listed in an ACT Government ACTNOWaste publication, *Waste Minimisation in the Construction and Demolition Industry*, but do not have regulations attached to them, are listed in Table 2.

Table 2 Known Permissible End Uses in the ACT of Some Specific Waste Types

Waste	End Use and/or Product
C&D Waste	
Concrete: unset	Washed and used on future projects.
Concrete: set	Crushed and used for future concrete works or as road base fill.
Bricks and Tiles	Cleaned and used on future projects, or crushed and used as backfill or gravel.
Aluminium and Steel	Retained for use on future projects, sold on as second-hand product or recycled into new products.
Gypsum plaster board	Retained large sheets for use on future projects, recycled into new plasterboard/gyprock product or used as a soil conditioner or for composting.
Timber/Green Waste:	Retained large beams/sheets/etc. for use on future projects, reprocessed into other timber building and landscaping products. Untreated materials can be used as firewood or chipped and used as mulch either on-site or at other projects.
Glass	Retained large sheets for use on future projects, crushed and used as aggregate in concrete, recycled into new products.
Carpet	Retained large pieces for use on future projects, sold on as second-hand product, used on-site to prevent erosion, dust mobilisation and weed invasion. Natural fibre carpets can be shredded and used as fill in garden beds or composted.
Inert Waste	
C&D Waste	See end uses for C&D waste.
Asphalt	It is understood from clarification with ACTNOWaste that waste asphalt and bituminous material can be used in the manufacture of roadbase. The application of the road base to land is not subject to environmental regulations, but the road base would need to meet engineering specifications.
Used Tyres	It is understood from ACTNOWaste that used tyres are transported to NSW for recycling.
Office and packaging waste	Not known at time of writing this report.
Biosolids	Not known at time of writing this report.
Clean Fill	N/A as ACT does not use this terminology.
VENM	The end use of VENM is unrestricted. At a facility which accepts in excess of 100m³ of soil, all fill used must be virgin excavated material (e.g. clay, gravel, sand, soil or rock) that is not mixed with any other waste.

4.5 Landfill Levy

The ACT DECCEW does not levy for waste disposal; ACTNOWaste operates the one landfill in ACT through Thiess services. There are disposal charges for commercial, asbestos and domestic waste, being for 2011-2012:

- Commercial and MSW waste: $121.90 per tonne;
- Asbestos waste: $136.80 per tonne; and
- Domestic/self haul: $68.67 per tonne.

4.6 Disposal Requirements for Asbestos Waste

Requirements for disposal of asbestos are listed in the ACT EPA Publication *Requirements for the Transport and Disposal of Asbestos Contaminated Wastes*, May 2010. Requirements include:

- Asbestos waste in any form must be disposed of only at a landfill site that may lawfully receive the waste;
- Disposal of asbestos waste in any form must be by way of burial;
- Before disposal of the asbestos waste, arrangements must be made with the occupier of the landfill site for the purposes of ensuring that the asbestos waste will be covered: initially to a depth of at least 0.5 m, and finally to a depth of at least 1 m (in the case of stabilised asbestos waste in bonded matrix) or 3 m (in the case of asbestos fibre and dust waste) beneath the planned final land surface of the landfill site;
- The burial of asbestos waste must be done on the same day it is received at the landfill site; and
- The asbestos waste must not be compacted before it is covered, and must not come into contact with earthmoving equipment at any time.

5. NEW SOUTH WALES

5.1 Legislative Approach

The New South Wales (NSW) Office of Environment and Heritage (OEH) administers the waste regulatory framework through the primary environment protection legislation in the state, the *Protection of the Environment Operations Act* 1997 (the POEO Act), together with the *Waste Avoidance and Resource Recovery Act* 2001 (the WARR Act 2001) and the *Protection of the Environment Operations* (Waste) Regulation 2005 (the POEO (Waste) Regulation). These key statutes contain the requirements for managing, storing, transporting, processing, recovering and disposing of waste. Supporting the key legislation are various guidelines relevant to specific areas of the waste regulatory framework.

To facilitate the beneficial reuse of waste materials, the POEO (Waste) Regulation makes provisions to exempt the use of certain waste materials from the regulatory requirements of applying waste to land, or the thermal treatment of waste. These exemptions prescribe specifically in which circumstances the residue waste has beneficial reuse opportunities, and how the beneficial reuse can be applied. The legislative approach in NSW in this regard is very prescriptive.

The Waste Avoidance and Resource Recovery Strategy (the WARR Strategy) is a requirement of the WARR Act 2001, and was developed with the primary objective to increase resource recovery across NSW, without compromising the beneficial uses of the environment. Under the WARR Strategy, a number of programs have been established to ensure NSW reaches its waste avoidance targets over the next five years.

The NSW Government Waste Reduction and Purchasing Policy (WRAPP) requires all state government agencies and state owned corporations to develop and implement a WRAPP plan to reduce waste in four areas:

- Paper products;
- Office equipment and components;
- Vegetation material; and
- Construction and demolition material.

The purchase decisions of these groups are based on the principles outlined in Waste Reduction and Purchasing Plans (WRAPP) and the Council Sustainable Choice Program.

Furthermore, there is a Waste and Sustainability Improvement Payment (WaSIP) program in place which offers financial incentives to 72 councils for meeting program requirements, including a requirement for Councils to put in place policies and procedures to ensure that all new developments consider waste management and resource recovery during construction and demolition.

5.2 Definition and Categorisation of Waste

In NSW, waste is categorised into groups that pose similar risks to the environment and human health. This categorisation facilitates waste management and appropriate disposal. Six waste classes are used:

- Special waste;
- Liquid waste;
- Hazardous waste;
- Restricted solid waste;
- General solid waste (putrescible); and
- General solid waste (non-putrescible).

NSW no longer categorises waste as inert. Prior to 2008, the categories for non-liquid waste in NSW were: hazardous, industrial, solid and inert (*Environmental Guidelines: Assessment, Classification & Management of Liquid & Non Liquid Wastes, NSW EPA* May 1999). In this guideline, inert waste is defined as "the least likely to undergo environmentally significant transformations; therefore it should not release significant quantities of greenhouse gases or leachates contaminated with nutrients and/or chemicals". Table 1 of this guideline lists wastes which are considered inert waste, and these included:

- VENM (now in general solid waste, non-putrescible category);
- Building and demolition waste (e.g. bricks, concrete, paper, plastics, glass, metal and timber) which is not mixed with other types of waste and does not contain asbestos waste, (now in general solid waste, non-putrescible category);
- Asphalt waste resulting from road construction etc.,(now in general solid waste, non-putrescible category);
- Used, rejected and unwanted tyres (now classified as special waste since it has unique regulatory requirements);
- Office and packaging waste (e.g. paper, plastics, glass, cardboard, metal and timber) (now in general solid waste, non-putrescible category); and
- Biosolids categorized as restricted use 1 or unrestricted use, in accordance with criteria set out in the NSW biosolids guidelines, *Environmental Guidelines: Use and Disposal of Biosolids Products*, December 2000 (now in general solid waste, non-putrescible category).

According to the OEH publication, *Waste Classification Guidelines,* December 2009, where waste is mixed with other waste types, the waste stream needs to be classified according to the waste type which poses the greatest risk to the environment. Table 3 indicates how NSW defines and categorises: C&D waste, VENM and waste asbestos. NSW no longer uses the terms “clean fill” or “inert” in a regulatory context.

Table 3 Waste Type Classifications in NSW

Waste Type	Classification
C&D Waste C&D waste is defined as "unsegregated material (other than material containing asbestos waste) that results from: • The demolition, erection, construction, refurbishment or alteration of buildings other than: chemical works, mineral processing works, container reconditioning works, or waste treatment facilities; or • The construction, replacement, repair or alteration of infrastructure development such as roads, tunnels, sewage, water, electricity, telecommunications and airports, and includes materials such as: bricks, concrete, paper, plastics, glass and metal, and timber, including unsegregated timber, that may contain timber treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP) but does not include excavated soil (for example, soil excavated to level off a site prior to construction or to enable foundations to be laid or infrastructure to be constructed)."	General Solid Non-putrescible
Waste Asbestos Asbestos is defined as "the fibrous form of those mineral silicates that belong to the serpentine or amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophyllite, chrysotile (white asbestos), crocidolite (blue asbestos) and tremolite. " Asbestos waste is defined as "any waste that contains asbestos." Asbestos waste falls under the special waste category as it has its own unique regulatory requirements.	Special
VENM Virgin excavated natural material means natural material (such as clay, gravel, sand, soil or rock fines): • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities; • That does not contain sulphidic ores or soils, or any other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette. By definition, VENM cannot be 'made' from processed soils. Excavated material that has been stored or processed in any way cannot be classified as VENM. A material can only be classified as VENM if it has been excavated from an area that is not contaminated with other waste materials or manufactured chemicals. Past land uses are a useful first indicator of likely contamination. The possibility that a previous land use has caused contamination of a site must be considered when assessing whether an excavated material is VENM. Classification as VENM requires certainty that the material concerned is not contaminated. Where it is uncertain whether an excavated material can be classified as VENM, a chemical assessment can determine if the material is contaminated. There is no chemical criteria for VENM, but standard practice is to consider site history and compare the chemical composition against the Australian background soils ranges, specified by the Australian New Zealand Conservation Council (ANZECC) background levels, and the National Environment Pollution Council background ranges. For reporting purposes at landfills, VENM is listed as C&D waste.	General Solid (Non-putrescible)

5.3 Regulation of Construction and Demolition Waste

New South Wales regulates those activities which are deemed to have the potential to cause environmental harm by releasing contaminants to air, land, and water. These activities are called scheduled activities, and require an environment protection licence (EPL). Schedule 1 of the POEO Act provides a list of activities which OEH considers scheduled activities, and hence are required to comply with specified environmental standards.

The activities which are relevant to C&D waste include:

- Energy recovery where energy is recovered from general waste, and involves processing more than 200 tonnes per year;
- Recovery of general waste where the premises has on site at any time more than 2 500 tonnes or 2 500 cubic metres or waste, whichever is the lesser, and involves processing more than 120 tonnes of waste per day or 30,000 tonnes of waste per year;
- Waste disposal (application to land) where waste is disposed by application to land. This does not apply to:
  - Sites which take less than 200 tonnes per annum of C&D waste and/or VENM generated inside the regulated area (the regulated area is an area extending from Wollondilly to the Queensland border and west to the Blue Mountains, as defined in Schedule 1 of the POEO Act);
  - Sites outside the regulated area which take no more than 20,000 tonnes per annum of waste C&D and/or VENM which is generated outside the regulated area;
  - Sites where only VENM is applied to land;
- Thermal treatment of general waste; and
- Non thermal treatment of general waste if it processes more than 30,000 tonnes per year on-site, or has onsite at any given time 2 500 cubic metres of waste (whichever is the lesser).

Reuse of C&D materials, e.g. bricks which are cleaned and reused in another building or project, or the recycling of particle board to make more particle board, does not require any regulatory approvals. However, where C&D materials are processed and applied to land as fill or soil conditioner, or if they are processed to be used as a fuel, regulatory approvals are required under Clause 51 of the POEO (Waste) Regulation.

To facilitate the beneficial recycling of waste materials, OEH is able to exempt from certain regulatory requirements the use of waste as fuel or its application to land (as fill or as a soil enhancer). These exemptions are known as resource recovery exemptions and are only issued where the proposed use of the waste material is beneficial and does not cause harm to the environment or human health, and the resource recovery opportunity is bona-fide rather than a means of waste disposal.

An exemption may be a general exemption or a specific exemption. A general exemption may be given by way of notice published in the Gazette. A specific exemption may be given after an application is made to OEH.

The OEH publication, *Guidance Note for the Use of Non-standard Fuels* 2005*,* which was written to support the objectives of the WARR Act 2001, provides guidance for using some waste products as a non-standard fuel. Unused and uncontaminated timber offcuts or scrap wood have already been assessed for use as a fuel providing they meet agreed (generally standard) conditions.

OEH have general exemptions for some processed C&D wastes to be applied to land or used as fuel, without applying for specific regulatory approval, as long as the processed wastes meet the criteria set out in the general exemption.

Current general exemptions for use of processed C&D materials are:

1. Cement plaster for:
    a. application to land when incorporated within road making material; or
    b. use as an alternative input into thermal processes for non-energy recovery purposes in the manufacture of building products;
2. Soil or sand substitute that is derived from the processing of mixed construction and demolition waste including residues from the processing of skip bin waste through a batch or continuous process. The resultant soil or sand substitute must have a typical maximum particle size of 9.5 millimetres and can only be applied to land for the purposes of construction or landscaping;
3. Excavated natural material (ENM), which is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has been excavated from the ground and contains at least 98% (by weight) natural material, does not include material that has been processed or contains acid sulphate soils (ASS) or potential acid sulphate soils (PASS). ENM does not meet the definition of Virgin Excavated Natural Material in the POEO Act but meets the chemical criteria set out in the exemption, and can only be applied to land as engineering fill or used in earthworks;
4. Recovered aggregate**,** meaning material comprising of concrete, brick, ceramics, natural rock and asphalt which is processed into an engineered material, and where the chemical concentration or other attribute of the recovered aggregate does not exceed the criteria outlined in the *Recovered Aggregate Exemption* 2010 can only be applied to land for road making activities, building, landscaping and construction works; and
5. Ground plasterboard can be used as a soil amendment to modify the properties of soils, as long as the soil conditioner meets the requirements set out in the exemption.

Specific exemptions are granted after application to the OEH, and after the OEH is satisfied that there is no higher reuse available for the waste type and the exemption will not cause harm to the environment. These specific exemptions are not publically available; however, according to the WARR Strategy 2007, exemptions in December 2007 were being considered for Benedict Sand and Gravel, for a proposed wood waste co-generation project, and Blue Circle Southern Cement (now Boral) for non-standard fuel investigations (including wood waste). Reprocessing of asphalt or bitumen materials for use as road making material requires a specific exemption; however, it is understood that OEH are currently writing a general exemption for this waste type and end use.

Furthermore, there is a *Specification for Supply of Recycled Material for Pavements, Earthworks and Drainage* 2010, prepared by Manager Roads & Transport Directorate, IPWEA (NSW), which sets engineering standards for road and drainage materials, produced using recycled materials.

5.4 Permissible End Uses and Products

End uses of specific wastes currently permissible under legislation are shown in Table 4.

Table 4 Known Permissible End Uses in NSW of Some Specific Waste Types

Waste	End Use and/or Product
C&D Waste	
Wood waste	Reuse, and use as a non-standard fuel. For example, in December 2007, Benedict Sand and Gravel were in the planning stages for a proposed wood waste co-generation project, and Boral Southern Cement, were in the planning stage for non-standard fuel investigations (including wood waste). Under Appendix 1 of the Non-Standard Fuels Guidelines, unused and uncontaminated timber offcuts and scrap wood are approved as a substitute fuel, and OEH considers that they can be used in most fuel burning applications provided that they meet agreed (generally standard) requirements. If the waste stream does not meet the criteria set out in the nonstandard fuels guideline, a specific approval from OEH will need to be granted.
Particleboard	Can be recycled to make new particleboard. Since this is not applied to land, reuse is unrestricted.
Gypsum plaster board	Uncontaminated plasterboard can be recycled for use in new plasterboard or the gypsum used in agricultural soil conditioners. The former end use is unrestricted whereas the latter end use is subject to the conditions of the general exemption.
Ceramics (e.g. tiles and roof tiles)	Crushed to form an aggregate for drainage material or rock base for driveways. This end use is subject to the conditions of the *Recovered Aggregate General Exemption* 2010.
Concrete	Concrete is crushed and blended to produce an aggregate used in pavement construction, concrete production and various civil construction works. This end use is subject to the conditions of the *Recovered Aggregate General Exemption* 2010.
Bricks	Bricks are cleaned and reused in another building or project, crushed into brick chips for use as a landscape material or crushed into finer particles for use in manufacturing road-base, track and drainage material, fill sand or new bricks. The latter two end uses are subject to the conditions of the *Recovered Aggregate General Exemption* 2010.
Waste soil and rock	Waste soil and rock which can contain 2% general waste. Providing it meets the specifications of ENM, it can be used for engineering fill.
VENM	See end uses for VENM.
Inert Waste	
C&D Waste	See end uses for C&D waste.
Asphalt	Crushed and recycled by feeding back in to asphalt mix for road construction. This can be used if it meets the conditions of the recovered aggregate exemption. If it does not meet the requirements of the exemption, specific approval is required. It is understood that OEH is currently writing a general exemption specifically for application of recycled asphalt to land.
Used Tyres	There is a general exemption for waste tyres: The *Waste Tyre Civil Engineering Exemption* 2008 applies to used, rejected or unwanted tyres, including shredded tyres, tyre pieces, or tyre crumb, and contains at least 98% tyre material. Subject to chemical composition constraints, the waste tyre can only be applied to land for use in civil engineering structures and road making activities (using industry recognised standards such as the Building Code of Australia). Waste tyres can also be used as an alternative fuel, under the non-standard fuels guidelines. This requires a specific exemption from OEH. Although it is not publically available which facilities have been granted a specific exemption for the use of waste tyres as a nonstandard fuel, OEH have granted approvals for this particular end use. For example, the Boral Cement (formerly Blue Circle Southern Cement) Berrima plant have been approved to use up to 30 000 tonnes of waste tyres per year as a fuel.
Office and packaging waste	These could be used to generate fuel, as long as they meet the criteria set out in the *Non-Standard Fuels Guideline* 2005. Packaging glass could also be used to make aggregate for road base under the *Recovered Glass Sand Exemption* 2010.
Biosolids	There is a general exemption for biosolids application to land as a soil enhancer.

Clean Fill	N/A as NSW does not use this terminology.
VENM	The end use of VENM is unrestricted. VENM is required for daily cover at a landfill, and is also required to be used for rehabilitation of contaminated land in site audit situations under the *Guidelines for the NSW Site Auditors Scheme (2nd edition)*. Under these guidelines, site redevelopment needs to consider the aesthetic nature of the environment, and therefore ENM, which can contain 2% waste, cannot be used. VENM can also be used as fill, engineering fill and landscaping.

5.5 Landfill Levy

In NSW, the Waste and Environment Levy (the levy) is applied to waste received at licensed waste disposal facilities. The levy rate is set to increase annually over the period to and beyond 2014.

The levy applies in the regulated area of NSW which is made up of the Sydney Metropolitan Area, the Extended Regulated Area, which is the Illawarra and Hunter regions, and as of 1 July 2009, the Regional Regulated Area, which includes the north coast local government areas from Port Stephens to the Queensland border, as well as the Blue Mountains and Wollondilly local government areas.

Facilities that are used solely for the purposes of recovering, recycling or processing waste, other than liquid waste, do not have to pay the levy.

The Levy rates in 2011-12 for all solid wastes are listed below:

- Sydney metropolitan area: $82.20 per tonne;
- Extended regulated area: $78.60 per tonne; and
- Regional regulated area: $31.10 per tonne.

Rates include Consumer Price Index (All Groups Index) adjustments for Sydney, issued by the Australian Statistician. The levy rates are scheduled to rise progressively to about $120 per tonne in today's dollars in the Sydney Metropolitan Area and the Extended Regulated Area, and $70 per tonne in the Regional Regulated Area by 2015–2016.

Deductions from the waste and environment levy provide an incentive for waste facilities to move recycled and processed material into the marketplace. A deduction can only be claimed when waste is:

- Transported from a waste facility to another place for lawful reuse; or
- Transported to another facility for lawful recycling, processing, recovery or disposal; or

- Where waste is used for an approved operational purpose by the occupier (*approved operational purpose (AOP) deduction*). This includes using VENM for final capping works at the facility, and the placement of VENM below the natural water table to rehabilitate a sandmine. To be eligible for an AOP deduction, final capping works or disposal of VENM below the water table must be specified in the EPL for the facility. Note that VENM for daily cover is not considered an AOP, and hence is not deductible.

Wastes which are exempted from the levy are:

- Dredging spoil (DSP), where DSP must be from the excavation of material to provide and/or increase the dimensions of a waterway, or ensure that existing channels, berths or construction works are maintained at their design specifications. DSP can be from either the C&D or Commercial and Industrial (C&I) waste stream;
- Wastes collected for approved community services; and
- Wastes collected for emergency incidents (can be from MSW,C&I,C&D waste streams).

5.6 Landfill Requirements for Disposal of Inert Waste

Schedule 1 of the POEO Act specifies activities that require a NSW EPL. This listing includes landfill or application sites within the Sydney metropolitan or extended regulated areas.

Under the POEO Act, C&D waste which is generated outside the regulated area can be disposed to land outside the regulated area without requiring an EPL if the waste received is less than 20,000 tonnes per annum. Furthermore, disposal of C&D waste and/or VENM in quantities less than 200 tonnes per annum does not require an EPL if the waste is disposed of inside the regulated area or if the waste is generated inside the regulated area. However, local councils may require such sites to have development consent under the *Environmental Planning and Assessment Act* 1979, and may set conditions of consent. This would vary between local government areas.

The POEO Act also sets out general post-closure requirements for waste facilities, and the POEO (Waste) Regulation 2005 sets out a number of specific requirements in relation to landfill sites. These include bi-annual volumetric surveys, waste tracking and record keeping. Under the POEO (Waste) Regulation, Clause 15, the occupier of a waste facility who is required to pay contributions and receives over 5 000 tonnes of solid waste per year must ensure that there is an approved weighbridge installed at the waste facility.

The most significant document relating to the operation and on-going management of landfills in NSW is the NSW EPA publication *Environmental Guidelines: Solid Waste Landfills*, released in January 1996 (the NSW Landfill Guidelines). These guidelines were developed to establish a consistent and environmentally responsible approach to the management of NSW landfills. The adopted approach is performance-based, focusing on achieving the most environmentally beneficial outcomes rather than prescribing actions and standards.

In order to ensure that the solid inert landfill is only taking receipt of inert wastes, the operator of the landfill should have a screening process to establish that soil and other inert material received is not contaminated, and this screening process must be capable of screening out non solid inert wastes greater than 200 millilitres per tonne or 200 grams per tonne.

The NSW Landfill Guidelines specify a number of goals for the main environmental issues associated with landfill operation. Goals are presented for water and air pollution, land management and conservation, and hazards and loss of amenity. These goals are primarily qualitative and do not make reference to any specific criteria. The NSW Landfill Guidelines then set out the strategies that have been adopted to enable the environmental goals to be achieved.

According to the NSW Landfill Guidelines, if a landfill is only receiving relatively inert materials such as building and demolition wastes which have no potentially hazardous characteristics, the potential environmental impacts are generally restricted to dust, noise and sedimentation, which can be readily controlled. All licensed inert landfills, however, will still need to comply with all aspects of environmental impacts.

The NSW guidelines do not specify that all landfills be lined, and OEH evaluates this requirement on a case by case basis through the licence condition of the landfill. Factors governing whether the landfill is lined depend on the locality of the landfill, the rainfall of the area, the proximity of the landfill to water bodies and the types of wastes received.

It is understood from conversations with OEH that there are new landfill guidelines due to be released in 2012, and the tendency is to specify that all new landfills be lined.

5.7 Requirements for Disposal of Asbestos Waste

Under Clause 43 of the POEO (Waste) Regulation, asbestos waste must be disposed of at a landfill approved to receive asbestos waste. At the time of disposal, asbestos waste must be covered with VENM or another approved material to a depth of 0.15 m and at the end of each day to a depth of 0.5 m. For final capping, bonded asbestos and asbestos contaminated soils must be covered to a depth of 1 m. Friable asbestos must be covered to a depth of 3 m.

6. NORTHERN TERRITORY

6.1 Legislative Approach

The Environmental Protection Authority (EPA) division of the Department of Natural Resources, Environment, The Arts and Sport (NRETAS) administers the Northern Territory's waste regulatory framework through the *Waste Management and Pollution Control Act* 2009 (the WMPC Act).

Together with the Waste Management and Pollution Control (Administration) Regulations 2010 (the WMPCA Regulations), it provides the overarching legislation to provide for the protection of the environment through encouragement of effective waste management and pollution prevention and control practices in the Northern Territory (NT).

6.2 Definition and Categorisation of Waste

According to the *Guide to Environment Protection Approvals and Licences,* February 2010 waste types are categorised according to source. These waste categories are:

- MSW;
- C&I;
- C&D;
- Green waste; and
- Listed waste.

Listed wastes are specified in Schedule 2 of the WMPCA Regulation and include tyres and asbestos.

According to the NRETAS publication, *Asbestos Disposal in the Northern Territory*, asbestos is defined as "a naturally occurring mineral fibre that was widely used in building materials up to 1985. The most commonly found building materials that contain asbestos are asbestos cement products, e.g. fibro sheeting (flat and corrugated), water, drainage and flue pipes, roofing shingles and guttering". All removal of asbestos-containing material must be undertaken in compliance with the *National Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002 (2005)].*

Also, according to the NRETAS Publication *Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory* September 2010 (the NT Landfill Guidelines), “Inert wastes are wastes that are non-biodegradable, non-flammable, non-chemically reactive and have no potentially hazardous content once landfilled. Inert waste must not be contaminated or mixed with any other material. NRETAS considers 'inert waste' to be natural materials such as clay, soil and rock,concrete, brick or demolition product that are free of: combustible, putrescibles, degradable or leachable components; hazardous substances or materials (such as municipal solid waste) likely to generate leachate via biological breakdown; any products or materials derived from hazardous waste treatment, stabilisation or disposal practices; materials such as clinical and listed waste that present a risk to human health if excavated and; contaminated soil or other contaminated materials. ”

There is no definition for C&D waste, VENM, or clean fill in the WMPC Act. C&D waste is categorised as inert waste. Landfills require daily cover, but there is no requirement for the chemical composition of the soil.

6.3 Regulation of Construction and Demolition Waste

The NT regulates those activities which are deemed to have the potential to cause environmental harm by releasing contaminants to air, land, and water. These activities are listed in Schedule 2 of the WPMC Act, and are required to have an environmental protection approval, or a licence.

An environment protection approval is required to develop a landfill. This is required for all new landfills, regardless of the size of the community. This includes constructing, installing or carrying out works in relation to premises for disposing of waste by burial, other than:

- Domestic waste generated by a domestic residence and disposed of on the land on which the premises are situated;
- Domestic waste from temporary construction camps;
- Waste generated by pastoral activities that is disposed of on the land on which the pastoral activities are carried out;
- Waste rock, rubble and other inert materials used for the purpose of reclaiming land; and
- Waste of a prescribed class.

An EPL is required to operate a landfill. An EPL is required for inert landfills that service a population of more than 1 000 people and landfills of any size that accept listed waste.

6.4 Permissible End Uses and Products

There is no data on C&D recovered waste, and all recycled materials in the NT are from the MSW waste stream. Thus no comment can be made on permissible end uses of the C&D waste stream at the time of writing this report.

6.5 Landfill Levy

There is no landfill levy in the NT, however municipal councils at major landfills in Darwin and Alice Springs impose a levy on tyres.

6.6 Landfill Requirements for Disposal of Inert Waste

Under Schedule 2 of the WMPC Act, a landfill which services a population of more than 1 000 people is required to have an EPL. The NT Landfill Guidelines provides guidance as to how landfills should be managed and regulated in the Northern Territory. These guidelines are based on Victorian Guidelines and are quite prescriptive.

It is understood from discussions with NRETAS, however, that, because of the remoteness of some of the communities in the NT, the small population of the NT, and the extreme climatic conditions (especially in the wet season) the NT Landfill Guidelines are often neither relevant nor practical. For this reason, NRETAS published an accompanying set of guidelines, *Waste Management Guidelines for Small Communities in the Northern Territory* 2009. Although it was written specifically for landfills in communities of less than 1 000 people (which are not required to be licenced) some of the recommended practices are practical for landfills in larger communities also. In this guideline, best practice is considered to cover the landfill with 0.15 m designated fill cover regularly. It is understood from NRETAS that inert wastes can be approved for use as daily cover.

Landfills are not required to be lined, nor are they required to have weighbridges.

All landfills require a closure and post closure plan detailing the revegetation program and ongoing management and maintenance requirements for the site. All species used in revegetation programs should be sourced from local provenance.

6.7 Requirements for Disposal of Asbestos Waste

Schedule 2 of the WMPCA Regulation defines asbestos waste as a listed waste, and thus an EPL is required for facilities which collect, handle and dispose of asbestos, regardless of serviceable population size. The EPL requires compliance with the NRETAS Publication, *Asbestos Disposal in the Northern Territory*. Requirements for asbestos disposal include:

- All landfills which accept asbestos must have a designated area or trench (monocell) for the acceptance of ONLY asbestos contaminated material (ACM);
- Each load of asbestos waste must be covered with a suitable inert material immediately after it has been deposited;
- The licensee must keep records of the volume and GPS coordinates of all asbestos disposed of by burial. These records are to be made available to an Authorised Officer upon request;
- Asbestos fibre and dust waste shall be deposited to a depth of at least 3 m;
- Stabilised asbestos waste in a bonded matrix must be deposited to a depth of at least 1 m;
- Asbestos waste must not come into direct contact with compaction or earthmoving equipment;
- Asbestos fibre and dust wastes must be buried to a depth of at least three metres below compacted material, and covered finally by orange marker mesh identifying that asbestos is buried below; and
- Stabilised asbestos wastes in a bonded matrix must be buried to a depth of at least one metre below compacted material, and covered finally by orange marker mesh identifying that asbestos is buried below.

7. QUEENSLAND

7.1 Legislative Approach

The Queensland Department of Environment and Resource Management (DERM) administers Queensland's waste regulatory framework through the state's primary environment protection legislation, the *Environmental Protection Act* 1994 (the EP Act 1994). Together with the Environmental Protection Regulation 2008 (the EPA Regulation 2008), it provides the overarching legislation to regulate the removal, collection, transport, deposit, storage and disposal of waste. These are supported by the Environmental Protection (Waste Management) Policy 2000 (the EPWM Policy) and the Environmental Protection (Waste Management) Regulation 2000 (the EPWM Regulation), which co-ordinate and clarify waste management practices in Queensland and provide environmental safeguards for waste.

In order to promote the beneficial reuse of waste materials, Queensland has provisions to apply for beneficial use approvals for waste residue. These can be granted as a general or specific approval, however they are not as extensive as those in NSW, and most are done on a cases by case basis.

In order to meet waste reduction targets, in December 2010 Queensland's Waste Reduction and Recycling Strategy 2010–2020 (the WRAR Strategy) was introduced. This strategy sets clear targets to reduce waste generation and disposal, shifting the focus of waste disposal to resource reuse and efficiency, as outlined by the waste hierarchy. The *Waste Reduction and Recycling Act* (the WRAR Act), which became law on 12 October 2011, was introduced to underpin the strategy, including promoting waste reduction and resource recovery and diverting potential resources from landfill. This regulatory approach is consistent with the framework used in other states. Waste Reduction and Recycling Regulations will soon be developed to support the WRAR Act.

7.2 Definition and Categorisation of Waste

In Queensland, waste is categorised primarily into two groups, general waste and regulated waste. General waste comprises MSW, C&I and C&D waste. Regulated waste is waste that is of a type, or contains a constituent of a type, mentioned in Schedule 7 of the EP Regulation 2008. Regulated waste includes asbestos, tyres and treated wood.

Table 5 indicates how Queensland defines and categorises: C&D waste, inert waste, clean fill (called clean earth), waste asbestos and VENM.

Table 5 Waste Definition and Categorisation in Queensland

Waste Type	Classification
C&D Waste There is currently no definition for C&D waste in the regulations, however, it is understood that a definition of C&D waste will be included in the new Waste Reduction and Recycling Regulations. The Queensland WRAR Strategy, defines C&D waste as "waste that is generated as a result of building, refurbishing, renovating or demolishing structures, buildings and infrastructure such as roads, bridges and docks, and includes material such as timber, clean soil, concrete, asphalt, plasterboard, steel, bricks, ceramic and clay tiles, and aluminium."	General
Inert Waste There is no definition for inert waste in Queensland.	N/A
Clean Earth and Clean Earthen Material In Queensland, there is no definition for clean fill or VENM, but instead the terms "clean earth" and "clean earthen material" are used. In Schedule 2, Section 60 of the EP Regulation 2008, clean earth is defined as "earth that has trace elements and contaminant levels within the interim ecologically-based investigation levels for urban land use under the document '*Schedule B(1)—Guidelines on the Investigation of Soil and Groundwater'*, forming part of the *National Environment Protection (Assessment of Site Contamination) Measure 1999*. The regulations define Clean Earthen Material as: "(a) bricks, pavers, ceramics or concrete that does not contain embedded steel reinforcing rods, pulverised to size of no more than 100 mm; or (b) clean earth."	Not considered a waste
Waste Asbestos There is no regulatory definition for waste asbestos. Asbestos is considered a regulated waste, in accordance with Schedule 7 of the EP 2008 Regulation.	Regulated Waste
VENM This term is not used in Queensland, instead the term clean earth and clean earthen material is used.	N/A

7.3 Regulation of Construction and Demolition Waste

Queensland regulates those activities which are deemed to have the potential to cause environmental harm by releasing contaminants to air, land, and water. These activities are called environmentally relevant activities (ERAs) and require a development approval under the *Sustainable Planning Act* 2009, or are required to operate under a code of environmental compliance.

Schedule 2 of the EP Regulation 2008 provides a list of activities which DERM considers ERAs and hence are required to comply with specified environmental standards.

The activities which are relevant to C&D waste include:

- Crushing, milling, grinding or screening of general waste other than putrescible waste (which may include recovered concrete, steel and other recovered metals, plastics and timber) in excess of 5 000 tonnes per year to extract resources for reuse or recycling;
- Operating a waste disposal facility for disposing of more than 50 tonnes per year of general waste or regulated waste (whether alone or in combination with general waste). The relevant activity does not include using clean earthen material as fill;
- Operating a waste transfer station to sort and move waste of more than 3 tonnes or 30 cubic metres per year; and
- Operating a tyre recycling facility for receiving and reprocessing of tyres in excess of 1 000 tyres per year.

Furthermore, recycling of waste is regulated through Part 6A of the EPWM Regulation, and Chapter 8 of the Waste Reduction and Recycling Bill 2011, which gives provisions for the approval of waste to be used as a resource. This approval, called a beneficial use approval, changes the status of the material from a waste to a resource that is to be used for a beneficial purpose. The holder of a beneficial use approval is obliged through approval conditions to manage the resource in a way that prevents environmental harm.

Similar to NSW there are two types of approvals, a general beneficial use approval and a specific approval. A general approval is an approval for a resource, or stated type of resource, of which anyone can have the benefit. A specific beneficial use approval is an approval of a resource, or stated type of resource, of which only a stated person has the benefit. The *Guidelines for the Approval of a Resource for Beneficial Use EM 1719,* September 2011, is a Queensland DERM publication which provides guidelines on how to determine whether the reuse of waste requires a general or specific approval.

It is stated in Part 7, Section 68E of the EPWM Regulation and Section 172 of the Waste Reduction and Recycling Bill that a public register of all beneficial use approvals is required to be kept. However, it is understood through discussions with DERM that this public register does not currently exist.

7.4 Permissible End Uses and Products

There are two ERAs which are relevant to C&D waste, and inert waste types, which indicate Queensland allows for their reuse, subject to the conditions of the respective ERAs. These are for aggregate production from crushing of concrete, bricks, ceramics etc., and for rubber products and playground fill derived from shredded tyres. Regulatory approval for reuse of other C&D and inert wastes, by way of a general or specific beneficial use approval, was provided by DERM, and these are referenced in Table 6.

End uses for other wastes are known to be permissible end uses since they are listed in a Queensland Government policy document, *Guidelines to the Recycling Policy for Buildings and Civil Infrastructure* July 2009. All known permissible end uses are listed in Table 6.

Table 6 Known Permissible End Uses in Queensland of Some Specific Waste Types

Waste	End Use and/or Product
C&D Waste	
Wood waste	Timber is reused or crushed and shredded for compost (excluding arsenic treated timbers and by-products). Plywood and particle board is crushed and shredded for compost as well as used as a fuel source for furnaces.
Window glass and sheet glass	Crushed and used as aggregates in concrete and asphalt.
Ceramics (e.g. tiles and roof tiles)	Crushed to form an aggregate for drainage material or rock base for driveways. The recycling of ceramics for this end use is deemed an ERA and hence is subject to compliance conditions.
Concrete	Crushed for concrete rubble/aggregates as drainage material, pipe bedding, erosion control, pavements, road carparks, driveways etc. The recycling of concrete for this end use is deemed an ERA and hence is subject to compliance conditions.
Bricks	Bricks can be reused for landscape treatments as paving, dry stack walls; crushed for brick rubble/aggregates, decorative and as drainage material, pipe bedding, erosion control, pavements, roads, carparks, driveways etcetera. Recycling of bricks is deemed an ERA and hence is subject to compliance conditions.
Inert Waste	
Clean earthen material	See end uses for clean earthen material.
C&D Waste	See end uses for C&D waste.
Asphalt	Recyclable asphalt mixed with new asphalt during production of hot mix paving for road use, pot holes, and low use trafficable roads. Asphalt is typically 95% aggregate and 5% tar.
Used Tyres	Tyre recycling (not including retreading) is considered an ERA under Schedule 2 of the EP Regulation 2008, which is regulated by the state and may include shredding to produce a material used in manufacture of rubber products or playground fill. Specific exemptions have been granted for use of waste tyres in civil construction projects, bank stabilization and platforms for swimming pools.

Office and packaging waste	Landscape treatments – as mulch, compost, shredded for animal bedding. We are also aware that DERM are receptive to beneficial use applications for using paper waste as a non-standard fuel.
Clean Earth and Clean Earthen Material	This has unrestricted use as Queensland does not consider this material a waste. Also, disposal of clean earthen material is not considered an ERA, and hence rehabilitation of a quarry (for example) with clean earthen material, is unregulated.
VENM	Not used in Queensland. See Clean Earth and Clean Earthen Material.

7.5 Landfill Levy

Queensland waste will be leviable starting 1 December 2011, and will apply in a zone which runs along the east coast of the state. Waste generated in this zone must pay the levy, even if the waste is disposed of outside the zone. Wastes generated and disposed outside the zone do not have to pay the levy.

An initial rate of $35 per tonne of waste disposed will apply to commercial and industrial waste, construction and demolition waste, and contaminated and acid sulfate soils. Municipal solid waste, which includes household kerbside and self-haul waste, and wastes from park and street bin maintenance, will not attract levy payments. Clean earthen material, and correctly managed asbestos, will also not be leviable.

Regulated waste from non-domestic sources, which includes acids, oil, batteries, tyres, food processing and clinical waste, will be leviable, and higher levels of levy will apply depending on whether it is lower hazard or higher hazard as prescribed by regulation. The levy rates are shown in Table 7.

Table 7 Levy Rates in Queensland 1 December 2011

Waste Stream	Levy per tonne of waste disposed
Commercial and industrial waste	$35
Construction and demolition waste	$35
Contaminated and acid sulfate soils	$35
Lower hazard regulated waste	$50
Higher hazard regulated waste	$150
Municipal solid waste	No levy
Correctly managed asbestos	No levy
Clean Earthen Material	No levy

Exempt wastes, which will not be leviable (other than MSW, clean earthen material and asbestos) will also include:

- Disaster management waste;
- Contaminated soil, if the soil is being disposed of by or for the State or a local government as part of measures to reduce a risk to public health or the environment;
- Dredge spoil; and
- Waste collected by or for the State or a local government to remediate the results of a person having committed an offence against the general littering provision or the illegal dumping of waste provision.

A person who conducts a recycling activity may make an application (a residue waste discounting application) asking to approve a discounted rate for the waste levy to residue waste identified in the application. Residue waste means the waste from a recycling activity that is commonly disposed of to landfill after the recoverable components have been removed from material. For example, in metal recycling, the residue waste is the mainly non-metal component that results from recycling products such as motor vehicles, whitegoods, televisions and computers that have reached the end of their useful life.

7.6 Landfill Requirements for Disposal of Inert Waste

The DERM Guidelines *Landfill Siting, Design, Operation and Rehabilitation* 2010 (the QLD Landfill Guidelines) provide guidance as to how landfills should be managed in Queensland. The QLD Landfill Guidelines address similar design and operational aspects as guidelines in NSW and Victoria. However, similar to Victoria, the QLD Landfill Guidelines are prescriptive and provide detailed information and criteria for many aspects of landfill operations. The guideline focuses primarily on both putrescible and non-putrescible landfill facilities designed to accept more than 20,000 tonnes, but less than 75,000 tonnes per year of waste (medium size landfills). However, operators of smaller or larger landfill facilities can follow most of the guideline's requirements although some guideline requirements cannot be applicable to smaller or non-putrescible landfill facilities.

According to the QLD Landfill Guidelines, a non-putrescible waste landfill is a landfill which accepts waste containing 5% or less of putrescible waste component (i.e. a commercial and industrial waste landfill or construction and a demolition waste landfill). Furthermore, if the landfill is only taking disposal of separated non-putrescible (inert) parts of construction and demolition waste, then a leachate management system and a passive venting system for landfill gas is not required. Also, groundwater and surface water protection measures for smaller facilities and C&D facilities will be assessed on a case by case basis, depending on factors such as proximity to waters, disposal rate, risks from landfill gas migration and host soil characteristics. In particularly, non-putrescible waste landfills may (but not necessarily) require a passive venting system if larger landfills are located very close to residencies or at environmentally sensitive locations, or when landfill gas is found or suspected to be migrating off-site at unacceptable levels.

Since gas treatment or odour controls are generally not required for non-putrescible landfills, these landfills must have more stringent control requirements on the waste received. Periodic waste composition surveys to check compliance with the waste acceptance criteria are therefore recommended at least three times per year. A weighbridge must be also installed to facilitate accurate waste record keeping.

Criteria for the operation of non-putrescible landfills include:

- The minimum separation of non-putrescible wastes to the watertable is 2 m;
- Clean earth or clean earthen material, potential waste acid sulfate soil or separated non-putrescible (inert) parts of construction and demolition waste can be disposed below the watertable;
- A non-putrescible landfill must be more than 100 metres from surface waters and the '100 year flood plain';
- A non-putrescible landfill must be more than 200 metres from a noise or dust sensitive place;

- A non-putrescible landfill must be more than 100 metres from an unstable area;
- A non-putrescible landfill must be more than 1 500 metres from an aerodrome for piston-engined propeller-driven aircraft; and
- A non-putrescible landfill must be more than 3 000 metres from an aerodrome for jet aircraft.

If contaminated soil is used as coverage material at the landfill facility, it must not exceed the maximum contaminant levels and allowable leaching contaminant levels outlined in the QLD Landfill Guidelines.

7.7 Requirements for Disposal of Asbestos Waste

Under Schedule 3 of the EP Act 1994, disposal of unbonded asbestos waste, or more than 5 tonnes of bonded asbestos waste is considered a notifiable activity. As such the environmental agency is required to be notified within 22 working days of the activity taking place. Disposal of asbestos waste can take place at a non-putrescible landfill, and must be disposed of as a special burial of waste. This requires that earth moving equipment pushes the wastes to the bottom of the working face or into an excavated hole, and immediately covers it with earth or other waste material.

8. SOUTH AUSTRALIA

8.1 Legislative Approach

In South Australia (SA), the South Australian EPA (SA EPA) regulates the waste and resource recovery industry through the provisions of the *Environment Protection Act* 1993 (the EP Act 1993), together with the Environment Protection Regulations 2009 (the EPA Regulations 2009). The objective of the EP Act 1993 is to promote the reduction, reuse and recycling of material and natural resources, minimise waste, and to regulate the generation, storage, transportation, treatment and disposal of waste. In addition, SA EPA has specific powers in relation to conditions of approval for activities that require approval under the *Development Act* 1993.

The Environment Protection (Waste to Resources) Policy 2010 (W2REPP) helps the EP Act 1993 meet its waste objectives by specifying waste management policy with regards to waste collection, treatment, transport and disposal.

SA EPA has a general exemption for waste derived fill (WDF) derived from C&D waste to be applied to land (*Standard for the Production and Use of Waste Derived Fill*, January 2010). SA EPA also has guidelines to apply for a specific exemption to use waste residue as an alternative fuel (*Standard for the Production and Use of Refuse Derived Fuel*, June 2009). However, according to the W2REPP, Section 4, waste or treated waste is not considered waste if:

- It constitutes a product that meets specifications or standards published from time to time or approved in writing by the Authority; or
- If no specification or standard is published or approved, it constitutes a product that is ready and intended for imminent use without the need for further treatment to prevent any environmental harm that might result from such use.

Thus, SA EPA is prescriptive with regards to the beneficial reuse of aggregate used for fill material, provides guidelines for waste to be approved for use as an alternative fuel, and is less prescriptive for all other beneficial uses of waste material, providing the reuse meets engineering specification and does not cause harm to the environment.

The *Zero Waste Act* 2004 is an Act to establish a statutory corporation, Zero Waste SA, with the function of reforming waste management in SA. The SA EPA works with the waste and resource recovery industry and other agencies, such as Zero Waste SA to promote sustainable waste management practices, minimise waste and encourage resource recovery. SA's waste strategy primarily implemented by Zero Waste SA, combined with targets for specific waste streams, aims to achieve the state's waste reduction targets.

The charter of Zero Waste SA is to develop a waste strategy for the state which includes setting objectives, principles and priorities for the management of waste generated or disposed of in the State, undertaking an analysis of waste generation levels and waste management practices within the state of SA and, as a result of the analysis, to include targets or goals for waste reduction and waste diversion from landfill.

8.2 Definition and Categorisation of Waste

In SA waste is classified on a management basis according to which landfill the waste is best suited to be disposed. Waste categories are:

- MSW;
- C&D (inert and mixed);
- C&I (general and listed);
- Listed (including hazardous); and
- Special waste (including radioactive, quarantine and E-waste).

Table 8 indicates how SA defines and categorises: C&D waste, inert waste, clean fill (called waste fill in SA), waste asbestos and VENM.

Table 8 Waste Definition and Categorisation in South Australia

Waste Type	Classification
C&D Waste The SA EPA publication *EPA 842/09: Waste definitions* September 2009, categorises C&D waste into two subcategories: C&D mixed and C&D inert, and defines C&D as "the solid inert component of the waste stream arising from the construction, demolition or refurbishment of buildings or infrastructure but does not contain Municipal Solid Waste, Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste or Radioactive Waste". The SA EPA publication 842/09 notes that, "C&D waste (Inert) should be such that the entire composition of the C&D materials is Inert Waste with no contamination by foreign material. As such it is acknowledged that - with the aim of no contamination - there may be some negligible components of foreign material contained in the waste (as a guide, 0−5% maximum by volume per load). C&D waste (Inert) includes bricks, concrete, tiles and ceramics, steel and inert soils. Foreign material includes green waste, plastics, electrical wiring, timber, paper, insulation, tins, packaging and other waste associated with construction or demolition of a building or other infrastructure. Foreign material must not be Municipal Solid Waste, Liquid, Listed, Hazardous or Radioactive Waste. C&D Waste is considered C&D Waste (Mixed) if it contains significant foreign materials from construction and demolition activities that would render the load of waste no longer inert (as a guide, 5−25% maximum by volume per load). Foreign material includes green waste, plastics, electrical wiring, timber, paper, insulation, tins, packaging and other waste associated with construction or demolition of a building or other infrastructure. Foreign material must not be Municipal Solid Waste, Liquid, Listed, Hazardous or Radioactive Waste. Where waste from construction and demolition sites contains predominantly foreign materials or domestic waste, such as waste from household clean-ups collected by commercial skip bins, this is defined as Commercial and Industrial Waste (General)." Timber is not included in C&D waste in SA.	C&D inert C&D mixed
Inert Waste In the SA EPA publication *842/09*, solid inert waste is defined as waste "that has no active chemical or biological properties. These wastes do not undergo environmentally significant physical, chemical or biological transformation and have negligible potential to cause environmental harm. " The EP Regulations 2009 defines inert waste as "solid waste that has no active chemical or biological properties and is not subject to biological or chemical breakdown". Inert waste is not a category of waste in SA, it is rather a definition to sort between C&D inert, and C&D mixed.	N/A

Waste Type	Classification
Waste Fill In SA, "clean fill" material is now called "Waste fill". The EP Regulations 2009 define waste fill as "waste consisting of clay, concrete, rock, sand, soil or other inert mineralogical matter in pieces not exceeding 100 millimetres in length and containing chemical substances in concentrations (calculated in a manner determined by the Authority) less than the concentrations for those substances set out in [Part 1 3(1) of the EP Regulations 2009] but does not include waste consisting of or containing asbestos or bitumen."	C&D Inert
Waste Asbestos The SA EPA publication *842/09* defines asbestos as "the fibrous form of mineral silicates belonging to the serpentine and amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophyllite, chrysotile (white asbestos), crocidolite (blue asbestos), tremolite, or any mixture containing one or more of the mineral silicates belonging to the serpentine and amphibole groups." Asbestos-containing material is defined as "any material, object, product or debris that contains asbestos". Asbestos Waste means waste asbestos-containing material (ACM) including all removed ACM, as well as disposable items used during asbestos removal work, such as plastic sheeting and disposable coveralls, respirators and cleaning rags. Asbestos waste is categorised as a listed waste.	Listed
VENM SA does not use the category VENM, but instead uses waste fill. See waste fill for definition and categorisation.	N/A

8.3 Regulation of Construction and Demolition Waste

In Schedule 1 of the EP Act 1993 waste treatment and disposal is listed as a prescribed activity of environmental significance, and hence anyone undertaking waste treatment or disposal requires a licence in accordance with Section 36 of the EP Act 1993. Thus regulation of waste disposal and treatment is treated in the licence conditions of the facility.

According to the SA EPA Guidelines *Environmental Management of Landfill Facilities* January 2007, disposal of C&D waste must be at a landfill licensed to accept C&D waste. In the case of C&D inert waste, the waste cannot contain more than 5% by volume contaminants, and must not include any listed, hazardous or radioactive waste. The W2REPP bans disposal to landfill of tyres, cardboard and paper waste aggregate for resource recovery, glass packaging aggregate for resource recovery, metals other than metal products which cannot be easily separated, polyethylene terephthalate (PET) and high density polyethylene (HDPE) packaging aggregated for resource recovery. This is because SA recognizes that these waste materials have higher potential end uses than landfill disposal.

SA EPA has a standard for producing WDF from C&D waste; however, physical contaminants should be removed prior to processing and assessment to determine suitable chemical quality. WDF produced from C&D Waste may include aggregate, crushed bricks and concrete, recycled bitumen, and inert soils and must not contain other wastes.

WDF must be similar to virgin solid mineralogical materials naturally present in the soil profile, such as inert soil, rock, sand and silt. The WDF can be used to beneficially supplement or replace the virgin materials provided it does not cause harm to the environment or human health. The *Standard for the Production and use of Waste Derived Fill* sets standards for production of WDF from processed C&D waste.

The guidelines for use of WDF is equivalent to a general exemption in NSW for waste applied to land except that waste from an industrial facility e.g. foundry sand and recovered fines can also be used. If WDF meets the chemical criteria of waste fill, then it has unrestricted use (so long as site history doesn't suggest an issue). However, if WDF does not meet the chemical criteria of waste fill, then it has restricted reuse, and needs specific approval from the SA EPA (through an SA EPA appointed auditor).

Recycling facilities receiving and processing waste into WDF require authorisation from the EPA as a waste or recycling depot [activity 3(3) of Schedule 1 of the EP Act 1993]. Recycling facilities must ensure that the WDF is fit for purpose and will not cause harm prior to transfer to a reuse site. Appropriate quality assurance and quality control testing and assessment must occur at the site at which the WDF is produced to demonstrate suitability. A recovered products plan (RPP) must be submitted to the EPA that describes how the licensee will ensure this occurs. The risks associated with the product and requisite controls will depend on aspects such as the source, the chemical and physical nature and consistency of the material, the geophysical characteristics and risk of harm occurring at the proposed destination.

Another activity which is relevant to C&D waste is fuel burning, where the rate of heat released exceeds 5 MW. This activity would apply to a facility which is using waste as a fuel.

The *Standard for the Production and Use of Refuse Derived Fuel* was drafted to support the objects of the EP Act 1993 and in order to complement the W2REPP. Facilities that accept waste for the purposes of producing refuse derived fuel (RDF) will be licensed under activity 3(3) of Schedule 1 of the EP Act 1993. Facilities that use RDF will require a licence for their main activity and possibly for activity 8(2) Fuel Burning. Currently, the only facility which uses waste as a fuel in SA is Brighton Cement in Port Adelaide. Brighton Cement uses C&I waste (primarily timber and plastics).

Apart from the WDF and RDF guidelines, there are no other guidelines regulating recycling and reuse of C&D wastes. Often specific approvals need to be obtained from SA EPA.

8.4 Permissible End Uses and Products

Although there are only regulations governing two specific end uses of wastes, end uses for other wastes are known to be permissible since they are listed in a SA Government document, *The Zero Waste SA - SA 2009-2010 Recycling Activity Report,* June 2011. These are listed in Table 9.

Table 9 Known Permissible End Uses in South Australia of Some Specific Waste Types.

Waste Type	End use and/or Product
C&D Waste	
Clays, fines, rubble & soil:	Road base, batters/bunds, compost (bulking agent), quarry rehabilitation material or construction fill.
Concrete	Crushed as aggregate for road base, drainage or construction fill.
Bricks	Primarily crushed for road base, drainage or fill but also directly reused.
Inert Waste	
Waste Fill	See end uses for Waste Fill.
C&D Waste	See end uses for C&D waste.
Asphalt	According to *Zero Waste SA - SA 2009-10 Recycling Activity Report*, June 2011, asphalt is recycled to produce road base and quarry rehabilitation material.
Used Tyres	The best use for used tyres is re-treading, provided that the casings are of good quality and meet Australian safety standards. A number of retreaders operate in SA, and approximately 30% of all waste tyres are re-treaded. Re-treads are now widely considered safe for general use; the transport industry is a major user of re-treaded tyres. Another end use of tyres is Rubber Crumb, which is produced by buffing the tyre during the retreating process, or by a number of other technologies used in tyre disposal, including cryogenics and shredding. The rubber crumb can be used for the production of: new tyres, athletic field surfaces, rubberised bitumen and asphalt, rubber/plastic products, moulded extruded rubber products, surface coatings and playground surfaces. There has also been some use of tyres as a base for landscaping in raised garden beds and cascading rock gardens.
Wood waste	Timber derived from C&I waste in the Adelaide metropolitan area is being re-processed and converted into an alternative fuel at Brighton cement in Port Adelaide.
Waste Fill	Waste fill has unrestricted use (so long as site history doesn't suggest an issue). If it does not meet the chemical criteria of waste fill, then it has restricted reuse, and needs specific approval from SA EPA (through an SA EPA appointed auditor).
VENM	SA uses the terminology waste fill instead of VENM.

8.5 Landfill Levy

A levy is payable by the licence-holder of a waste depot for all waste received that is to be disposed of at that depot. There is no levy on waste fill material. The levy is not applicable at recycling depots or transfer stations, only when the waste is disposed of. The levies for the financial year 2011 to 2012 for solid wastes (per tonne) are:

- For a non-metropolitan depot disposing of non-metropolitan waste (non-metro rate) $17.50;
- For a metropolitan depot disposing of non-metropolitan waste brought to the depot by or on behalf of a wholly non-metropolitan council (non-metro rate) $17.50; and
- Any other case (metro rate) $35.00.

These levies will be subject to increases each financial year, based on the Consumer Price Index (CPI).

8.6 Landfill Requirements for Disposal of Inert Waste

The EP Regulations 2009, together with the SA EPA Publication *Environmental Management of Landfill Facilities (Municipal Solid Waste and Commercial and Industrial General Waste)* January 2007, provide guidance for landfill operational practices in South Australia. There are no guidelines specifically for solid inert landfills.

According to the EP Regulations 2009 a landfill which receives in excess of 10,000 tonnes of waste per year must have a weighbridge. According to SA EPA, there are no inert landfills in South Australia, and if there were, they would not be required to be lined. Daily and intermediate covers for landfills are required through the licence on a case by case basis.

The W2REPP formally bans whole tyres from being disposed to landfill. If waste tyres are unsuitable for recycling or other uses, they can be shredded into pieces not larger than 250 mm in any direction and can be deposited at a waste depot licensed to dispose of shredded waste tyres. The waste levy applies to tyres disposed of at landfills.

9. TASMANIA

9.1 Legislative Approach

The EPA division of the Department of Primary Industries, Parks, Water and the Environment (DPIPWE) administers Tasmania's waste regulatory framework through the state's primary environment protection legislation, the *Environmental Management and Pollution Control Act* 1994 (the EMPC Act). Together with the Environmental Management and Pollution Control (Waste Management) Regulations 2010 (the EMPCWM Regulations), it provides the overarching legislation to regulate the removal, collection, transport, deposit, storage and disposal of waste.

Legislation is also supported through the *Land Use Planning and Approvals Act* 1993 which imposes conditions on premises where activities take place which are deemed by the authority to pose a risk to the environment. In such cases, the premises are required to hold a permit to undertake the activity. Schedule 2 of the EMPC Act designates those activities which require permits, and sets a framework to ensure that the activity will not cause harm to the environment.

The legislation is also supported by the Tasmanian Waste and Resource Management Strategy 2009, and the Strategic Plan 2009-2012, which discourages waste generation and promotes reuse and resource recovery, in accordance with the waste hierarchy.

This regulatory approach is consistent with the framework used in other states.

9.2 Definition and Categorisation of Waste

In Tasmania, according to the *DPIWE Landfill Sustainability Guide,* Sept 2004 (the TAS Guidelines), waste is categorised primarily into four groups:

- Solid Inert Waste (including Clean Fill);
- Potentially Contaminated Waste;
- Putrescible Waste; and
- Controlled Waste.

Potentially contaminated waste includes fill material (which does not meet the criteria of clean fill) and various grades of contaminated soil. Controlled waste includes asbestos and tyres. Table 10 indicates how Tasmania defines and categorises: C&D waste, inert waste, clean fill, waste asbestos and VENM.

Table 10 Waste Definition and Categorisation in Tasmania

Waste Type	Classification
C&D Waste The Tas Guidelines define building and demolition waste as that waste coming from "building and demolition works, including bricks, concrete, glass, plastics, metal, and timber." Treated timber is not considered a solid inert waste.	Solid Inert
Inert Waste The Tas Guidelines define inert waste as "Wastes that do not undergo environmentally significant physical, chemical or biological transformations and have no potentially hazardous content once landfilled. Inert waste must not be contaminated or mixed with any other material."	Solid inert
Clean Fill The Tas Guidelines define clean fill as "Soil, rock, concrete, asphalt or similar non-putrescible material that is not contaminated by other waste; and does not contain contaminated levels exceeding limits for fill material set by the Director in Bulletin 105, *Classification and Management of Contaminated Soil for Disposal*."	Solid Inert
Waste Asbestos There is no formal definition for waste asbestos. Asbestos waste is categorised as a controlled waste.	Controlled
VENM Tasmania does not use the term VENM.	N/A

9.3 Regulation of Construction and Demolition Waste

Under Schedule 2 of the EMPC Act, activities which have the potential for significant environmental impact are designated level 2, and are therefore required to have a permit to operate. Activities which are relevant to the C&D industry are:

- Waste treatment and disposal facilities, and transfer stations receiving more than 100 tonnes per year. These facilities are exempt if storage is temporary, or if the facility is only used for disposal of clean fill;
- Materials handling facilities for processing (by crushing, grinding, milling or separating):
  - Chemicals or rubber at a rate of 200 tonnes or more per year; or
  - Rock, ores or minerals at a rate in excess of 1 000 cubic metres per year; and
- Fuel burning, where matter combusts at a rate exceeding one tonne per hour.

Thus, the disposal of waste at a landfill, waste treatment facility or transfer station is regulated through the permit conditions of that facility. Landfills only accepting clean fill (for rehabilitation of quarries, for example) do not require a permit. Facilities which recycle gravel and rubble, or asphalt from the C&D waste stream, are regulated through their permit conditions. Likewise, facilities which shred waste tyres to produce rubber products are also regulated. The generation of waste to produce thermal energy would also be regulated by the permit conditions of the facility.

According to Section 9 of the EMPCWM Regulations, a person must not use land, or cause land to be used, for the disposal of general waste other than with approval, or in an approved manner. Disposal is permitted for the deposit of soil, rock, concrete, bituminised pavement or similar non-putrescible and non-water-soluble material that is not contaminated by other wastes and does not contain contaminant levels exceeding limits set by the Director. Disposal of wood sawdust, shavings and chips from untreated and uncontaminated timber is also approved.

9.4 Permissible End Uses and Products

The exemption for aggregate material derived from soil, rock, concrete, bituminised pavement or similar C&D waste to be applied to land indicates that this end use is permitted and unrestricted, provided it meets the conditions of the exemption outlined in Section 9 of the EMPCWM Regulations.

Furthermore, the listed activities in Schedule 2 which could apply to the recycling of rubber tyres, and to the recycling of C&D rubble, and C&D waste asphalt, indicates that Tasmania would allow for their reuse, subject to the conditions of the respective permits. These end uses are aggregate production from crushing of C&D rubble, recycled asphalt from waste asphalt, and for rubber products and playground fill derived from shredded tyres respectively.

No other permissible end uses of C&D wastes are known at the time of writing this report.

9.5 Landfill Levy

There is no EPA administered landfill levy. However, it is understood that the three regional waste groups (The Southern Waste Strategy Authority, The Northern Tasmanian Waste Management Authority, and the Cradle Coast Authority) all charge a waste levy of approximately $2 per tonne for disposal to landfill.

9.6 Landfill Requirements for Disposal of Inert Waste

The primary landfill guideline in Tasmania is the Tas Guidelines. While the Tas Guidelines itself is not a legally enforceable document, permit conditions (which are legally enforceable) are likely to be derived from the acceptable standards and recommendations described within it.

According to the Tas Guidelines, landfills which are able to accept solid inert waste and fill only are called Category A Landfills, and are often also referred to as solid inert landfills. Criteria for the operation of Category A landfills in Tasmania include:

- Depth between waste and water table at seasonal peak is 2 metres;
- The minimum distance between a solid inert landfill and a permanent watercourse (excluding farm dams) is 50 m;
- The minimum distance between a solid inert landfill and an aerodrome is 10,000 m;
- The minimum distance between a solid inert landfill and a residence is 300 m;
- Liners are not required for inert landfills;
- Weighbridges are not required;
- Daily cover is not required for a solid inert landfill;
- Weekly cover of 0.3 m of soil is required;
- Intermediate cover of 0.3 m is required;
- Final cover requirements include: 0.3 m of clean fill material and 0.5 m of a final layer including topsoil. Clay capping and a drainage layer are only required on a case by case basis; and
- Stockpile of cover material must be kept on site which is sufficient for two weeks of operation.

10. VICTORIA

10.1 Legislative Approach

The primary legislation for waste management in Victoria is the *Environment Protection Act* 1970 (the EP Act 1970). Under the EP Act 1970, the Victorian EPA (VIC EPA) can create subordinate legislation, such as waste management polices (WMPs), state environment protection policies (SEPPs) and regulations.

The key subordinate legislation for the regulation and management of hazardous wastes, known as 'prescribed industrial wastes' (PIW) in Victoria's environment protection laws, is provided through the Environment Protection (Industrial Waste Resource) Regulations 2009. The new regulations came into effect on 1 July 2009. Guidance to support these regulations is provided in the Industrial Waste Resource Guidelines (IWRG).

Legislation is also supported through the Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (the EPSPE Regulations), which places conditions on those premises considered by VIC EPA to pose a risk to the environment, thus ensuring that they are operating in a way which does not cause harm to the environment.

Victoria primarily regulates PIW, and the end use of most other wastes (aside from disposal) is largely not regulated. Providing the waste could not cause harm to the beneficial uses of the environment (air, water and land), and meets the specifications for what it was designed (e.g. engineering specifications) then the reuse is not regulated. Where the proposed reuse can cause harm to the environment, then approval for its use must be sought from VIC EPA on a case by case basis.

In 2005 Sustainability Victoria launched *Sustainability in Action: Towards Zero Waste Strategy* (TZW), to support Victorians to generate less waste and maximise opportunities for material recovery. The strategy sets four state wide targets for waste reduction, resource recovery and littering, and specific targets and actions for Victoria's municipal and business sectors to deliver more sustainable use of resources by 2014.

The *Metropolitan Waste and Resource Recovery (MWARR) Strategic Plan* 2009 has been developed to further deliver on key targets and intentions of TZW for metropolitan Melbourne. The Metropolitan Waste Management Group, a Victorian State Government statutory body responsible for coordinating and facilitating the delivery of municipal solid waste management across metropolitan Melbourne, is responsible for delivery of the MWARR Strategic Plan.

10.2 Definition and Categorisation of Waste

In Victoria, waste is categorised into four groups according to their disposal/reuse determination. These are:

- Fill material;
- Solid inert waste from an industrial source;
- Putrescible waste from an industrial source; and
- Prescribed industrial waste (PIW) (including contaminated soil).

Almost all of Victoria's waste regulations pertain to PIW.

Table 11 indicates how Victoria defines and categorises: C&D waste, inert waste, clean fill, waste asbestos and VENM.

Table 11 Waste Definition and Categorisation in Victoria

Waste Type	Classification
C&D Waste Construction & Demolition waste has no definition in the regulations but, according to the *IWRG 600.2 Waste Categorisation* December 2010, C&D is categorised as a "Solid inert waste from an industrial source"**,** and described as **"**Building/demolition material, e.g. concrete, bricks, dry timber, plastic, glass, metals, bitumen;" Contaminant concentrations do not exceed those specified in *IWRG* 621 *Soil Hazard Categorisation and Management,* June 2009*.*	Solid Inert Waste from an Industrial Source
Inert Waste According to *IWRG 600.2 Waste Categorisation* December 2010, "Solid inert waste is hard waste that has a negligible activity or effect on the environment. The waste may be either a municipal or industrial waste." This would include, waste arising from building and demolition activities including concrete, bricks, dry timber, plastic, glass, metals, bitumen and shredded tyres, providing that contaminant concentrations do not exceed those specified in *IWRG 621*.	Solid Inert Waste from an Industrial Source
Clean Fill Clean fill, which is referred to as fill material in *IWRG 600.2*, consists of "soil (being clay, silt and/or sand), gravel and rock of naturally occurring materials." Clean fill is used to describe naturally occurring material such as soil, sand and rock. Soil may be classified as clean fill, when: • An assessment will demonstrate that the material is not contaminated; or • Contaminant levels are below those specified in *IWRG 621*; or • Any elevated level of metals (such as arsenic) or other constituents can be demonstrated to be of natural origin. Where it can be demonstrated that the constituents of concern are naturally elevated, Vic EPA does not consider these soils to be 'contaminated' and therefore can be classified as fill material, or clean fill. According to the *IWRG 623, Clean Fill Guidelines-Draft for Comment*, May 2011, clean fill must not contain: • Domestic waste; • Industrial waste such as concrete, brick, asphalt, pipe, plastics, metal or wood; • Organic matter;	Fill Material

• Category A, B, or C prescribed industrial waste, or soil with contaminant levels above the 'fill material' thresholds in Table 2 of *IWRG 621*; • Acid sulphate, soil and rock; and • Asbestos or asbestos-contaminated soil.	
Waste Asbestos There is no explicit definition for waste asbestos. Disposal and transport of asbestos waste is regulated under *IWRG 611.1. Asbestos Transport and Disposal,* July 2009.	Prescribed Industrial Waste
VENM This term is not used in Victoria in a regulatory context, which instead uses the term "clean fill".	N/A

10.3 Regulation of Construction and Demolition Waste

Under the EP Act 1970, premises which have the potential for significant environmental impact are regulated by the EPSPE Regulations. These regulations designate certain industrial or commercial activities (scheduled categories) as scheduled premises, and are therefore subject to works approvals (for construction or modification of facilities or processes) and/or licences (for operating conditions, discharge limits, monitoring and reporting requirements).

Scheduled premises are listed in Schedule 1 of the EPSPE Regulations, and those which are relevant to the C&D industry are:

- Landfills used for the discharge or deposit of solid wastes; and
- Premises which recover energy from waste at a rated capacity of at least 1MW.

Deriving energy from waste is considered a scheduled activity, and regulation is provided through a specific works approval and licence conditions.

Disposal of C&D materials is regulated through the landfill licensing requirements, and the material classification guidelines. C&D materials sent to landfill must be classified correctly as C&D materials. Where the C&D material does not meet the chemical criteria specified in *IWRG 621 Soil Hazard Categorisation and Management* June 2009, then the C&D materials cannot be disposed of at a solid inert landfill.

The Worksafe Victoria publication, *Recycling Construction And Demolition Material Guidance On Complying With The Occupational Health And Safety (Asbestos) Regulations 2003,* January 2007, provides information to assist industry to meet its obligations under the *Occupational Health and Safety (Asbestos) Regulations* 2003. The guidance material describes an auditable procedure to verify that asbestos-containing material have been removed from C&D materials prior to recycling.

Because of the inert, uncontaminated nature of the C&D waste stream, application to land of recycled C&D waste is considered to pose minimal risk to the environment and hence there is currently no VIC EPA legislation for the recovery and reprocessing of uncontaminated C&D waste for application to land. Requirements for C&D recycled wastes (through contractual agreements between the recycler and the purchaser, e.g. VicRoads) are that they meet engineering specifications. The recycled waste also needs to be fit for purpose and will not impact the environment, but there are no regulations specific to the use of recycled waste.

Programs such as TZW and MWARR are in place through Sustainability Victoria to help Victoria to meet its waste management and reduction targets, by maximising opportunities for material recovery. The *Sustainability in Action: Towards Zero Waste Strategy* launched in 2005, supports Victorians to generate less waste. The landfill levy is a market tool to encourage this.

10.4 Permissible End Uses and Products

According to Sustainability Victoria's waste minimization program, TZW, the C&D sector resource recovery rate increased to 80% in 2009-2010. The improved recovery reflected growing integration between Victoria's construction, demolition and recycling industries, as well as the increasing use of recycled concrete in the construction of roads, pavements and other civil infrastructure. According to *A Taste of Waste*, a publication from the Victorian Government Metropolitan Waste Management Group, May 2011, "Construction and Demolition (C&D) materials like bricks, concrete, paving slabs, tiles, sand, gravel are recycled into building materials such as road base, drainage media and recycled bricks."

Because Victoria does not regulate recycling in the C&D industry, it has been difficult to obtain specific information regarding permissible end uses of C&D wastes during the writing of this report. A list of known permissible end uses is tabulated in Table 12.

Table 12 Known Permissible End Uses in Victoria of Some Specific Waste Types.

Waste	Product and/or End Use
C&D Waste	
Tiles Gravel, Sand Concrete ,Bricks	Crushed as aggregate for road base, drainage, recycled concrete, recycled bricks.
Inert Waste	
Clean Fill	See end uses for clean fill.
C&D Waste	See end uses for C&D waste.
Used Tyres	These are banned from Victorian landfills because of their higher reuse potential. Vic EPA publication 1107 *Correct Disposal and Reuse Options for Used Tyres* recommends reuse as a second-hand tyre where safe to do so, reuse in retreats, reuse for the production of rubber products such as tyres, hose or underlay, use as safety barriers at racing venues and similar activities, use by farmers to weigh down covers on silage stacks, energy recovery at EPA-licensed premises, disposal to EPA-licensed landfill (shredded tyres only), bulking material in civil engineering works, unless specifically approved by Vic EPA. End-of-life tyres are used as a fuel in the Boral cement kiln at Waurn Pond in Victoria, which uses 1.5 million used tyres annually, or 50% of Victoria's supply.
Clean Fill	
Fill	Use as fill material, e.g. site filling/levelling. No licence required. However, reuse must not give rise to environmental (including aesthetic) and health impacts.
VENM	
N/A	Victoria uses the terminology clean fill instead of VENM.

10.5 Landfill Levy

The landfill levy was introduced in Victoria in 1992, and sets different levy rates per tonne for regional Victoria and metropolitan Melbourne. There is also a separate levy category for each of the three waste streams (municipal, industrial and prescribed) and a separate rate set for each category of prescribed waste. Current levy landfill rates, as of October 2011, are shown in Table 13.

Table 13 Current Victorian Landfill Levy Rates ($ per tonne of waste)

Year	Rural		Metropolitan & Provincial Centres		All Regions		
	Municipal waste	Industrial waste	Municipal waste	Industrial waste	Asbestos	Prescribed industrial waste category C	Prescribed industrial waste category B
2010–11	15	25	30	30	30	70	250
2011–12	22	38.50	44	44	30	70	250

Note: Metropolitan & provincial centres refers to landfills located within municipalities listed in Schedule C to the Act 'Rural' refers to landfills located within all other municipalities in Victoria.

The following premises are not subject to the landfill levy:

- Privately owned landfills that only receive wastes that consist of substances that were owned by the owner of the landfill before they became wastes; and
- Municipal council owned landfills that only receive the municipal wastes of an area with a population of less than 5 000.

A levy must be paid for all wastes that are deposited onto land at the premises, as defined in the licence. The landfill levy applies to all wastes that are received at transfer stations and recycling facilities on the landfill premises (as defined in the licence). Transfer station/recycling facility wastes that are levied and then removed from the licensed premises for recycling may be eligible for a recycling rebate.

All landfill cover material brought onto the licensed premises from external sources is subject to the levy. Where soils classified as fill material, according to *IWRG600.2, Waste Categorisation,* December 2010, are used as cover, the municipal levy rate applies. Where materials other than 'fill material' are used as cover, then the appropriate levy rate for that type of waste should apply. For example, if Category C contaminated soil is used, then the Category C prescribed industrial waste levy rate is applicable. However, in order for materials other than 'fill material' to be used as cover material, the licence holder must have obtained written approval from Vic EPA. A fixed rebate of 15% of all waste deposited onto land at the premises (from external sources) is provided for in the EP Act 1970. The rate for the cover rebate is fixed at the municipal rate, irrespective of the type of waste used for cover.

Materials imported onto site which are used in the construction of the 'containment vessel for waste' (i.e. cell liners, bund walls, final cap, gas collection or leachate management systems) are exempt from the levy and should not be included in the calculation of levy liabilities or disposal tonnages reported.

Where materials received as waste are received and are designated as being directly suitable for the construction of roads external to the licensed disposal area, i.e. do not require processing for the removal of unsuitable materials, then the material used is exempt from the levy (it is understood that this levy exemption is currently flagged for review by the VIC EPA).

Landfill cover material sourced from on-site excavations and wastes from a natural disaster are also not subject to the levy.

10.6 Landfill Requirements for Disposal of Inert Waste

A comprehensive legislative framework is in place in Victoria for the management of landfills and the protection of the environment from landfill activities. The overarching framework is set out in the Vic EPA Publication *1323.2 Landfill Licencing Guidelines,* August 2011 (the VIC Landfill Guidelines), which sets out objectives relating to landfill facilities. The key supporting document within this framework is the VIC EPA Publication *788.1 Best Practice Environmental Management – Siting, Design, Operation and Rehabilitation of Landfills,* September 2010 (the VIC BPEM). The VIC BPEM applies to municipal and non-hazardous waste landfills, and sets out a classification system for these landfills. The document addresses all stages of the life of a landfill.

The VIC BPEM considers a similar range of aspects as the NSW Landfill Guidelines. These include liner and leachate systems, groundwater monitoring, landfill gas collection, waste placement and cover, contingency planning and site after use. However, the VIC BPEM is more prescriptive than the NSW Landfill Guidelines as it lists very specific outcomes required for each aspect. In addition, the VIC BPEM provides significantly more detail for each aspect, including suggested measures to achieve the required outcomes, references to useful documentation and background information relating to the aspect and outcomes.

In Victoria, all new landfills are required to be lined, and all landfills which are subject to the landfill levy and located in a municipality listed in Schedule C of the EP Act 1970 are required to use a weighbridge. According to the VIC Landfill Guidelines, the depth of the daily cover layer is dependent on the type of waste being deposited at the landfill. The default depth for daily cover is 0.30 metres, however, at premises which take only solid inert wastes, the daily cover depth is 0.15 metres.

The VIC Landfill Guidelines defines criteria for low risk landfills, including solid inert landfills. These criteria include:

- The minimum separation of solid inert wastes to watertable is 2 m;
- Fill material can be disposed below the watertable;
- A solid inert waste landfill must be at least 100 m from surface waters;
- A solid inert waste landfill must be at least 200 m from buildings and structures;
- A solid inert waste landfill must be at least 1 500 m from an aerodrome for piston-engine propeller-driven aircraft;
- A solid inert waste landfill must be at least 3 000 m from an aerodrome for jet aircraft;
- The final cap must consist of 0.3 m of earthen cover, 0.5 m of low-permeability clay, 0.5 m of soil sub-base and a layer of topsoil/mulch; and
- Storage ponds and other drainage measures should be designed to contain and control rainfall run-off for a 1-in-10-year storm event.

The VIC EPA requires on-going aftercare of a licensed landfill once it has closed until such time that the site has stabilised and no longer poses a threat to the environment. Furthermore, the VIC BPEM states that the long term performance requirement for an established phytocap in a low risk rural landfill is 274,000 litres per hectare per year. The detail of the cap construction is also detailed in the VIC BPEM.

Lastly, tyres which are made wholly or partly of natural or synthetic rubber or similar material are banned from landfill in Victoria unless the tyres have been shredded into pieces not exceeding 250 mm in size in any dimension.

10.7 Requirements for Disposal of Asbestos Waste

Under the Environment Protection (Industrial Waste Resource) Regulations 2009 the disposal of waste asbestos, whether of industrial or domestic origin, is controlled by VIC EPA. The VIC EPA Publication*, IWRG 611.1 Asbestos Transport and Disposal* July 2009, provides guidelines as to how asbestos waste is transported and disposed.

Disposal must only be at a site licensed by VIC EPA to accept waste asbestos. Licence conditions require waste asbestos to be handled and covered in such a manner that no dust is generated. Specifically, before compacting, the asbestos should be covered with a layer of soil at least 0.3 m thick or with a layer of waste at least 1 m thick.

11. WESTERN AUSTRALIA

11.1 Legislative Approach

The Western Australian DEC administers the waste regulatory framework through the state's primary environment protection legislation, the *Environmental Protection Act* 1986 (the EP Act 1986). The object of the EP Act 1986 is to protect the environment, and one of its five guiding principles is the principle of waste minimisation. Legislation is also supported through the Environmental Protection Regulations 1987 (the EP Regulations 1987), which designates those premises considered by WA DEC to pose a risk to the environment, and sets a framework to ensure that the designated premises (called prescribed premises) are operating in a way which does not cause harm to the environment.

The key subordinate legislation for waste management in WA is the Waste Avoidance and Resource Recovery Act 2007 (the WARR Act 2007), which provides the framework for waste minimization and reuse, in accordance with the waste hierarchy. The WARR Act 2007 establishes the Waste Authority, which has the designated authority to promote sustainable waste management practices, minimise waste, and encourage resource recovery. The Waste Authority also has the responsibility to develop and implement WA's waste strategy, and to levy waste being disposed at landfills. Supporting legislation for the WARR Act 2007 is the Waste Avoidance and Resource Recovery Regulations 2008 (the WARR Regulations 2008).

The *Waste Avoidance and Resource Recovery Levy* Act 2007, and its supporting Waste Avoidance and Resource Recovery Levy Regulations 2008, provides legislation on how to impose the waste disposal levy on landfills.

11.2 Definition and Categorisation of Waste

Waste types are categorised on a management basis, in accordance with the type of landfill to which they can be disposed. These waste categories are:

- Clean fill;
- Inert;
- Putrescible;
- Hazardous;
- Intractable; and
- Special.

Hazardous wastes are typically wastes which need to be treated prior to disposing to landfill. Intractable wastes are those wastes which are difficult to dispose of or treat safely, and need to be disposed of in very secure landfills. Special wastes can be disposed of subject to special conditions (e.g. asbestos and biomedical waste).

Table 14 indicates how WA defines and categorises: C&D waste, inert waste, clean fill, waste asbestos and VENM.

Table 14 Waste Definition and Categorisation in Western Australia

Waste Type	Classification
C&D Waste According to the WA DEC publication *Landfill Waste Classification and Waste Definitions* 1996, C&D waste is defined as materials in the waste stream which arise from construction, refurbishment or demolition activities of buildings, or infrastructure-type development such as roads, bridges, dams, tunnels, railways, and airports. Building and demolition waste includes bricks, concrete and associated unavoidable small quantities of paper, plastics, glass, metal and timber that should be recovered). C&D waste is not mixed with any other type of waste (specifically green and food waste), and does not contain any asbestos.	Inert Waste Type I
Inert Waste Inert waste is defined as "Wastes that are largely non-biodegradable, non-flammable and not chemically reactive." Inert wastes are subdivided into three separate classes: • Type I - Inert Wastes are as listed below and contain contaminants in concentrations less than the specified criteria. Examples of Type 1 inert wastes are: – Building and demolition waste (as defined in C&D waste above); – Asphalt waste (e.g. resulting from road construction and waterproofing works); – Biosolids categorised for unrestricted use; – Casting sand (that does not contain leachable components which would require disposal in a higher class of landfill); – Blasting sand or garnet (including that used for stripping tributyl tin containing paints); • Type II - Wastes consist of non-biodegradable organic materials such as tyres and plastics, which are flammable and require special management to reduce the potential for fires. Examples of Type II inert wastes are used, rejected or unwanted tyres (including shredded tyres or tyre pieces); and • Type III - Waste materials are from DEC licensed secondary waste treatment plants, subject to appropriate assessment and approval of that waste and the specified landfill.	Inert
Clean Fill According to the WA DEC publication *Landfill Waste Classification and Waste Definitions* 1996, clean fill is defined as "material that will have no harmful effects on the environment and which consists of rocks or soil arising from the excavation of undisturbed material. For material not from a clean excavation, it must be validated to have contaminants below relevant ecological investigation levels (as defined in the document *Assessment Levels for Soil, Sediment and Water, Department of Environment, 2003*)".	Clean Fill

Waste Type	Classification
Waste Asbestos According to the WA DEC publication *Landfill Waste Classification and Waste Definitions 1996*, "Asbestos waste is categorised as a special waste, which means it is regarded as hazardous but which, with special management techniques, may be disposed of safely within specified classes of landfill." Asbestos waste is a Type I Special Waste.	Type I Special Waste
VENM According to the WA DEC *Landfill Waste Classification and Waste Definitions* 1996, Virgin excavated natural material is classified in the clean fill category and is defined as "(clay, gravel, sand, soil and rock), or such material that is mixed with: • Waste that has been excavated from areas that are not contaminated as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals, and does not contain sulfidic ores or soils (e.g. acid-sulfate soils and peats); or • Materials not from a 'clean excavation' that have been validated to meet relevant ecological investigation levels."	Clean Fill

11.3 Regulation of Construction and Demolition Waste

Under the EP Act 1986, premises which are considered by the authority to have the potential for significant environmental impact are designated prescribed premises, and thus are subject to a works approval or licence conditions under Section 62A of the EP Act 1986.

Prescribed premises are listed in Schedule 1 of the EP Regulations 1987, and those which are relevant to the C&D industry are:

- Premises at which waste building or demolition material (for example, bricks, stones or concrete) is crushed or cleaned at a rate in excess of 1 000 tonnes per year;
- Premises at which waste, excluding medical waste, clean paper and cardboard, is incinerated at a rate in excess of 100 kg per hour;
- A solid waste facility (other than a soil blending and composting facility) at which solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land at a rate in excess of 1 000 tonnes per year;
- A solid waste depot at which waste in excess of 500 tonnes per year is stored, or sorted, pending final disposal or reuse;
- A class I inert landfill site at which waste in excess of 500 tonnes per year (as determined by reference to the waste type set out in the document entitled *Landfill Waste Classification and Waste Definitions 1996* published by the Chief Executive Officer and as amended from time to time) is accepted for burial;
- Premises at which gaseous, liquid or solid fuel with a sulphur content of less than 0.25% is burnt in a boiler at a rate greater than 2 000 kg per hour for the supply of steam or in power generation equipment; and

- Premises at which gaseous, liquid or solid fuel with a sulphur content of greater than 0.25% is burnt in a boiler at a rate greater than 500 kg per hour for the supply of steam or in power generation equipment.

Thus, disposal of C&D waste is regulated through the landfill licensing requirements, and the material classification guidelines.

11.4 Permissible End Uses and Products

The use of recycled C&D waste is largely unregulated by DEC, and it is generally the responsibility of town planning and local councils to approve the use of these products, if applied to land. Deriving energy from waste is considered a prescribed activity, and regulation is provided through specific works approval and licence conditions. It is understood that there are currently no facilities generating energy from waste in WA, but there is a pending application for a waste to energy facility at Kwinana which is being considered for approval. The proposed waste stream however is from the C&I and MSW sectors.

Recently, the Shire of Augusta-Margaret River began construction on the first of two roads which will use 100 tonnes of recycled crushed glass (RCG) in the asphalt surface. This was the first public demonstration site in regional WA to use RCG recovered from local kerbside collections as an alternative to virgin materials in road construction.

Since the regulation of the end use of recycled waste has been largely delegated to local government, it has been difficult to obtain any more information regarding permissible end uses. In WA, the recycling/recovery rate of C&D waste was 17% in 2006/2007 (*Australian Government National Waste Report* 2010), which suggests that currently there are not many end uses for C&D wastes being implemented, other than disposing to landfill.

11.5 Landfill Levy

All licensed landfills in the Perth metropolitan area, and non-metropolitan landfills which receive waste from the Perth metropolitan area, are subject to the levy. The levy for inert landfills is calculated based on volume. Currently the levy is $12 per cubic metre with a small correction. Inert landfills in the nonmetropolitan area must pay the levy only on the waste received from the metropolitan area. Clean fill and treated contaminated soils (according to DEC policy) used for cover and final landscaping after the completion of landfill operations is exempt up to a depth of 0.5 m. Recyclable materials which are collected and stored on-site are exempt from the levy (subject to approval from DEC). Green waste recycled for use offsite is exempt from the levy.

Green waste for post-closure rehabilitation (up to a depth of 0.15 m) can be claimed as an exemption.

Rebates for recyclable materials, which have already been subject to the levy, can be claimed, and awarded subject to the approval of DEC.

11.6 Landfill Requirements for Disposal of Inert Waste

Under the EP Regulations 1987, landfills which dispose of inert wastes are considered class I landfills, and are required to be licensed if they receive more than 500 tonnes of waste per year. The landfill guidance document, the WA DEC Publication *Best Practice Environmental Management – Siting, Design, Operation and Rehabilitation of Landfills* 2005 (the WA BPEM) is only applicable to class III (putrescible) landfills, and there are no guidance documents for class I landfills. According to DEC, class I landfills are not required to be lined, and weighbridges are not required. The depth and type of daily cover is specified in the licence conditions on a case by case basis.

11.7 Requirements for Disposal of Asbestos Waste

Under Part V of the EP Act 1986 all asbestos material must be disposed at a disposal site licensed to accept asbestos waste.

Guidance for disposal of asbestos waste is provided in the DEC publication, *Disposal of Material Containing Asbestos*. Prior to disposal, asbestos material must be:

- Separated from other material for disposal where that is reasonably practicable;
- Wrapped or contained in a manner that prevents asbestos fibres entering the atmosphere during transportation by road; and
- Labelled or marked with the words “CAUTION ASBESTOS” in letters no less than 50 mm high.

Daily and intermediate cover are regulated on a licence by licence basis.

12. SUMMARY

The following tables provide summaries of the key legislation in each jurisdiction examined in this review, the regulatory requirements for landfill licencing and landfill levies, and the landfill requirements for landfills which accept only inert wastes.

Table 15 Key Legislation in each Jurisdiction

Jurisdiction	Environmental Authority	Key Legislative Documents
ACT	Department of Environment Climate Change Energy and Water (DECCEW)	*Environment Protection Act* 1997 Environment Protection Regulation 2005 *Waste Minimisation Act* 2001 Waste Minimisation Regulation 2001
NSW	Office of Environment and Heritage (OEH)	*Protection of the Environment Operations Act* 1997 *Waste Avoidance and Resource Recovery Act* 2001 Protection of the Environment Operations (Waste) Regulation 2005
NT	Department of Natural Resources, Environment, The Arts and Sport (NRETAS)	*Waste Management And Pollution Control Act* 2009 Waste Management and Pollution Control (Administration) Regulations 2010
Queensland	Queensland Department of Environment and Resource Management (DERM)	*Environmental Protection Act* 1994 Environmental Protection Regulation 2008 Environmental Protection (Waste Management) Policy 2000 Environmental Protection (Waste Management) Regulation 2000 *Waste Reduction and Recycling Act* 2011
SA	Environment Protection Authority (EPA)	*Environment Protection Act* 1993 Environment Protection Regulations 2009 Environment Protection (Waste to Resources) Policy 2010
Tasmania	Department of Primary Industries, Parks, Water and the Environment (DPIPWE)	*Environmental Management and Pollution Control Act* 1994 Environmental Management and Pollution Control (Waste Management) Regulations 2010

Victoria	Environment Protection Authority (EPA)	*Environment Protection Act* 1970 Environment Protection (Industrial Waste Resource) Regulations 2009 Environment Protection (Scheduled Premises and Exemptions) Regulations 2007
WA	Department of Environment and Conservation (DEC)	*Environmental Protection Act* 1986 Environmental Protection Regulations 1987 *Waste Avoidance and Resource Recovery Act* 2007 Waste Avoidance and Resource Recovery Regulations 2008 *Waste Avoidance and Resource Recovery Levy Act* 2007 Waste Avoidance and Resource Recovery Levy Regulations 2008

Table 16 Regulatory Requirements for Licensing of Landfills for Receipt of C&D Waste and Fill Material

Australian Jurisdiction	Landfill Licencing Requirements
ACT	Needs to be licensed if receiving more than 5 000 tonnes of waste per year.
NSW: Regulated Area	Licence not required if receiving less than 200 tonnes of only C&D waste and/or VENM per annum from inside or outside the regulated area.
NSW: Unregulated Area	Licence not required if receiving less than 20,000 tonnes of only C&D waste and/or VENM per annum from outside the regulated area.
NSW: All Areas	Licences not required if only receiving VENM.
NT	Environment Protection Approval not required if using waste rock, rubble and other inert materials to reclaim land.
Queensland	Licence not required if only receiving clean earthen material as fill.
SA	No licence exemptions.
Tasmania	Permit not required if only receiving clean fill.
Victoria	No licence exemptions.
WA	Needs to be licensed if receiving more than 500 tonnes of waste per year.

Notes: The regulated area in NSW is defined in Schedule 1 of the POEO Act. Roughly it extends from Wollondilly in the south to the Queensland border, and west to the Blue Mountains.

Table 17 Landfill Levy Rates for the Year 2011-2012

Australian Jurisdiction	Levy Application	
ACT	No environmental levy. Private landfill fee	Commercial Waste $121.90/tonne Asbestos Waste: $136.80/tonne Domestic Waste $68.67/tonne
NSW	Sydney Metropolitan Area Extended Regulated Area Regional Regulated Area	All waste: $82.20/tonne All waste: $78.60/tonne All waste: $31.10/tonne
NT	No levy. Municipal councils levy on tyres in Alice Springs and Darwin.	
Queensland	C&I, C&D Waste, Contaminated soil Low hazard regulated waste High hazard regulated waste MSW, asbestos, clean earthen material	$35/tonne $50/tonne $150/tonne No levy
SA	Metropolitan waste: Non-metropolitan waste: Waste fill all areas	$35/tonne $17.50/tonne No levy
Tasmania	No environmental levy. Council districts have a volunteer levy	$2/tonne
Victoria	Rural Areas	Municipal: $22/tonne Industrial:$38.50/tonne
	Metropolitan and Provincial	Municipal:$44/tonne Industrial:$44/tonne Asbestos:$30/tonne
	All Areas	Prescribed Category C: $70/tonne Prescribed Category B: $250/tonne
WA	Perth metropolitan area	Inert $12/m^3 (with small admin correction) Putrescible: $25.76/tonne
	Outside Perth metropolitan area	No levy

Note: NSW Extended Regulated Area includes the Hunter and Illawarra Regions. The NSW Regional Regulated Area extends from Port Stephens to the Queensland border, and also includes Wollondilly and the Blue Mountains Local Government Areas.
In Victoria 'Metropolitan & provincial centres' refers to landfills located within municipalities listed in Schedule C to the EP Act 1970 (refer Appendix 1). 'Rural' refers to landfills located within all other municipalities in Victoria.

Table 18 Landfill Requirements for Inert Wastes

Australian Jurisdiction	Lining Required	Cover Requirements	Weighbridge Requirements
NSW	Evaluated on a case by case basis. OEH leaning towards requiring all landfills in regulated area are lined.	0.15 m daily cover 0.3 m intermediate cover	Required if receive > 5 000 tonnes/year
NT	No	0.15 m regular cover	Not required
Queensland	No	Not specified. Putrescible landfills require 0.2 m of clean earth material	Not required
SA	No	Case by case basis via licence conditions	Required if receiving > 10,000 tonnes/year
Tasmania	No. Clay liner required for putrescible landfills	No daily cover 0.3 m weekly cover	No
Victoria	Yes	0.15 m	Required for municipalities listed in Schedule C of the EP Act 1970.
WA	No	Case by case basis via licence conditions	Recommended in the WA BPEM at major landfill sites but not required

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