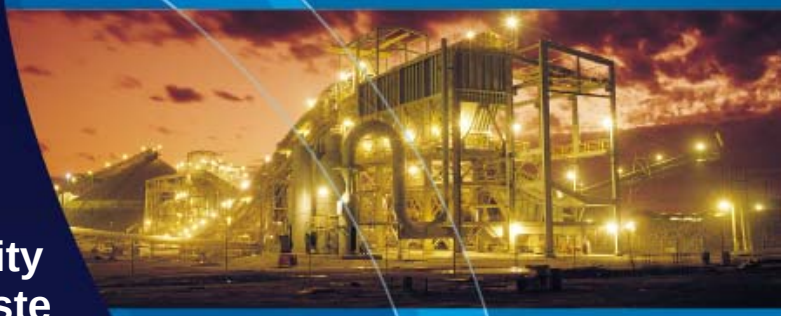
GRD

GRD Limited is a construction and development company



Submission to the Productivity Commission Inquiry into Waste Generation and Resource Efficiency In Australia

February 2006

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SUBMISSION TO THE PRODUCTIVITY COMMISSION INQUIRY INTO WASTE GENERATION AND RESOURCE EFFICIENCY IN AUSTRALIA

GRD LIMITED

FEBRUARY 2006

1. Introduction

GRD Limited, an Australian construction and development company which, through its subsidiary Global Renewables, has developed the UR-3R sustainable urban waste management solution and built the world's first UR-3R Urban Waste Management Facility at Eastern Creek, Sydney, is pleased to make this submission to the Productivity Commission's Inquiry Into Waste Generation and Resource Efficiency in Australia.

We note that the objective of the Inquiry is to identify policies that will enable Australia to address market factors and externalities associated with the generation and disposal of waste, including opportunities for resource use efficiency and recovery throughout the product life cycle (from raw material extraction and processing to the product design, manufacture, use and end of life management).

Our submission is based on seven years of research and experience by GRD and its subsidiaries GRD Minproc and Global Renewables in developing the UR-3R sustainable urban waste solution and in building and operating the Eastern Creek Facility which combines the most advanced technology for the optimum management of municipal solid waste and maximum recovery of resources from the urban waste stream. Global Renewables is also the preferred bidder for the Lancashire Waste Management Partnership Private Funding Initiative (PFI) Project in the United Kingdom and for the Western Region Waste Management Group Project in Melbourne.

In researching the potential benefits of the UR-3R process, Global Renewables in 2004 commissioned Nolan ITU Pty Ltd to identify and communicate the economic, environmental and social benefits of the technology in a triple bottom line assessment conducted as an independent study. This is the first time that such a complete assessment of Australian waste management systems has been undertaken. A copy of the Nolan ITU Report is attached and comprises a vital part of the GRD submission.

Despite the magnitude of the challenges in waste management in Australia, which have been identified by the Nolan-ITU Study and by a number of reviews or inquiries by several State Government environmental, sustainability or waste management agencies, there is little public or political awareness of the economic, environmental and social cost of Australia's present piecemeal approach to the management of the waste produced by our consumer society.

GRD Limited congratulates the Federal Treasurer, the Minister for Environment and the Productivity Commission for their initiatives in launching this Inquiry into Waste Generation and Resource Efficiency in Australia.

For clarity of presentation, our submission is arranged into the following sections:

1. Introduction
2. The challenges and opportunities for urban waste management in Australia
3. GRD's credentials to address the issues involved in the most effective management of the urban waste stream
4. The five key issues critical to the scope of the Inquiry to the extent that GRD has the experience to contribute ie:
    - 4.1) The economic, environmental and social benefits and costs of optimal approaches for resource recovery and efficiency and waste management, taking into account different waste streams and waste related activities;
    - 4.2) Institutional, regulatory and other factors which impede optimal resource efficiency and recovery, and optimal approaches to waste management, including barriers to the development of markets for recovered resources;
    - 4.3) The adequacy of current data on material flow, and relevant economic activity, and how data might be more efficiently collected and used to progress optimal approaches for waste management and resource efficiency and recovery;
    - 4.4) The impact of international trade and trade agreements on the level and disposal of waste in Australia; and
    - 4.5) Strategies that could be adopted by government and industry to encourage optimal resource efficiency and recovery.

We will also address another issue which we believe is critical to the ability of Federal and State Governments to manage the challenges and realise the opportunities in transforming our waste to resources, namely the low level of awareness of the issues involved among the public, and therefore in political debate.

Attached to the submission, as noted above, is a copy of the report by Nolan ITU *The National Benefits of Implementation of the UR-3R Process, a Triple Bottom Line Assessment.*

2. The Challenges and Opportunities of Urban Waste Management

In Australia's urban consumer economy, 80 percent of saleable products become waste within six months, and most municipal solid waste goes to landfill where it can generate leachates and methane gas for many decades. This has adverse long-term environmental and economic impacts, mainly through production of virile greenhouse gases (methane is 21 times worse than carbon dioxide as an agent contributing to atmospheric warming), contamination of groundwater and quarantining from other uses of land contaminated by waste.

Each Australian household generates an average of more than 850 kilograms of municipal solid waste every year, putting us in the highest quartile of waste generators globally.

In Australia, as is the case throughout the Western world, the management of waste sits alongside energy supply, environmental management and water supply in terms of its importance to sustainability and strategic planning.

But in Australia, more than in many other parts of the world, much of our waste continues to be hidden from sight in landfill and there is only limited public and

political awareness of the problems of waste management compared with the problems of energy, environment, and water supply.

At present in Australia, waste management is regulated by State authorities and managed by local councils guided by State waste management agencies and the landfill levies are low by global standards. This is at odds with the emerging global trend towards banning recyclables and putrescibles to landfill and instead recovering the useful resources contained within this substantial 'urban ore body'.

"Urban Resource Conservation"

Global Renewables has integrated world's best resource recovery processes, creating the UR-3R Facility to provide sustainable waste management

Though voluntary timetables have been adopted to phase out landfill disposal of waste in Australia, there are no strong drivers, or even guidelines to indicate how these timetables might be adopted.

New South Wales and Victoria have embraced the concept of resource recovery from municipal waste processing, but the other States have been slow in taking up this opportunity.

Beyond Australia (as Table 1 below illustrates) the world is well advanced with changes in favour of resource recovery from municipal waste processing.

Table 1

EU	All EU countries must, pursuant to the 1999/3 EC Landfill Directive, reduce the amount of biodegradable waste disposed to landfill by 50% by 2010.
Germany	Ban on landfilling of material with greater than 5% organic content from 2005.
UK	Landfill tax of £15/t from 2004, rising by £3/t annually to a maximum of £35/t. 25% of all household waste to be recycled/ composted in England and Wales by 2010.
Sweden	Ban on putrescible waste landfilling from 2002.
Austria	Ban on landfilling of material with greater than 5% organic content from 2004.
Belgium	Plans to ban direct landfilling of combustible waste.
Denmark	Plans to ban the landfilling of combustible waste.
USA	California, Washington and North Carolina have adopted medium term zero waste policies.
Canada	British Columbia and Ontario have adopted medium term zero waste policies.
China	Plans to reduce landfilling and incineration to meet significant 2008 Olympic and 2010 World Expo diversion targets.

Seen from a different perspective, every day Australians commit 50,000 tonnes of non-renewable resources, complex materials, toxic wastes and essential biomass to wasteful disposal (excluding building materials). That is equivalent to filling a football field with a 20m layer of waste every day or filling every football field in the country with urban waste in a decade.

The waste industry, driven by public health concerns, environmental and aesthetic considerations is actually concealing this huge volume of waste in landfills and disused quarries where the direct environmental impacts are managed but the enormity of the systematic wastefulness of our society remains hidden from public view and the long term (detrimental) environmental impacts are not accounted for.

3. GRD Limited's Credentials

In the 1990's GRD Limited, which has its foundations as a business in mining and in contract services to the mining industry, recognised the problems and the opportunities, created by the growing volume of urban waste. In 1998 the company began investing in research to find solutions for the problem through its contracting subsidiary,
GRD Minproc.

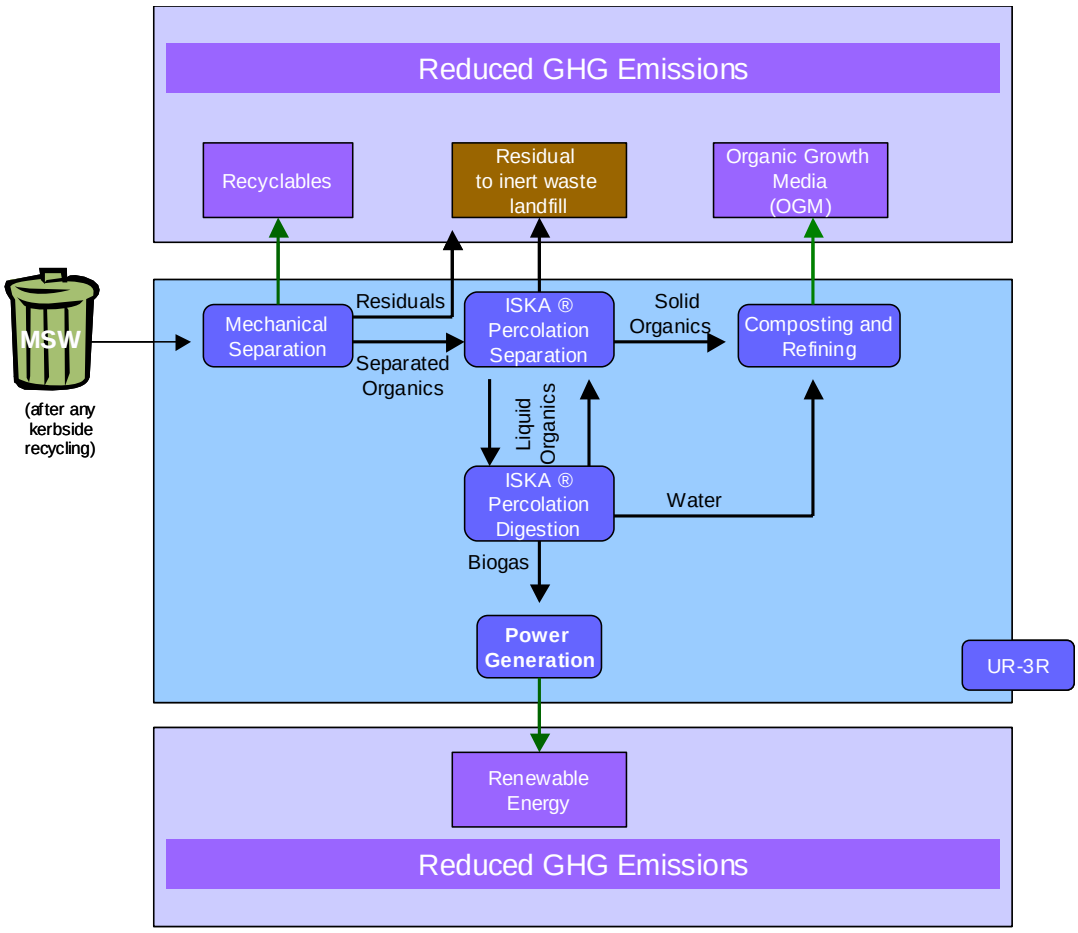
In April 2000, following the completion of a two-year global search and evaluation of the world's best alternative waste treatment technologies, GRD established Global Renewables to implement the development of UR-3R facilities in Australia.

In 2002 Global Renewables contracted with the New South Wales Waste Management Authority, WSN Environmental Solutions (formerly Waste Service NSW), in a public private partnership to build, own and operate the Eastern Creek UR-3R Facility, which began operating in September 2004.

The Eastern Creek UR-3R Facility is designed to process 260,000 tonnes of municipal solid waste per annum (12 percent of Sydney's waste) through integrated sorting, biological digestion and composting processes.

The plant will produce biogas sufficient to produce 17,000 megawatt hours of green energy (enough to power 2,250 households), 300,000 tonnes of Emission Reduction Units pa (carbon credits equivalent to taking 50,000 cars off the road), and more than 60,000 tonnes of compost products in addition to recyclable products (paper, glass, steel, plastics and aluminium). Mitsui & Co (Australia) Limited and BP Australia Ltd have entered into an agreement to forward purchase 1,500,000 tonnes of the Emission Reduction Units.

GRD's engineering contractor subsidiary, GRD Minproc, built the Eastern Creek Facility. Global Renewables also has technology licence arrangements with ISKA (of Germany) for use of the ISKA® Percolation system and with Sorain Cecchini Techno SRL (of Italy) for resource separation and composting processes.

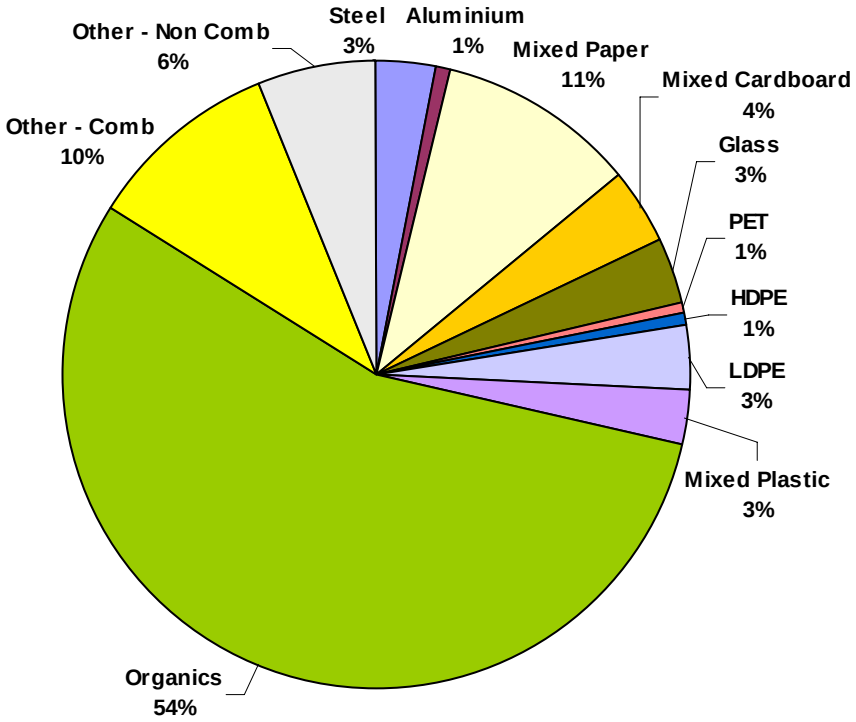


The UR-3R Process®

The UR-3R Facility receives and processes municipal solid waste (MSW), which includes collected household, commercial and green waste and is able to deliver a truly sustainable waste management solution by:

- ***Reducing** waste generation through community education and recognition of the full life cycle cost of waste management*
- ***Reducing** greenhouse gas and leachate emissions by processing the putrescible portion of the waste stream*
- ***Recovering** valuable recyclables from the non-putrescible portion of the waste stream*
- ***Recycling** the organic portion of the putrescible waste stream into renewable energy and high quality organic growth media (OGM), thereby reducing greenhouse gas emissions and leachate, and helping to close the carbon cycle.*

The Eastern Creek UR-3R Facility, Sydney, is recovering resources from as many components of the waste stream as possible



Breakdown of the resources contained in the waste stream received at the Eastern Creek UR-3R Facility, Sydney

In September 2005, the Eastern Creek operation passed an important milestone in receiving AS4454 certification for the composts, soil conditioners and mulches it produces.

Organic growth media produced from municipal solid waste at the Eastern Creek UR-3R Facility

As a result of GRD's successful research and its operations at the Eastern Creek UR-3R Facility:

- Alternative waste technologies such as the UR-3R Process® can now be viewed in Australia as a viable replacement for landfilling of putrescrible waste
- Alternative waste strategies are able to divert around 80%, and possibly more, of household Municipal Solid Waste from landfill
- The external costs of landfilling in Australia have now be quantified
- When the external costs of landfilling are taken into account, alternative waste treatments offer a highly competitive and fundamentally better treatment of municipal solid waste
- Alternative waste strategies have a higher propensity to fulfill sustainability principles, which have become the major plank in public planning policies throughout the world.

In the meantime, GRD's combination of leading edge waste treatment technology in the UR-3R Process® has received international recognition through its selection as preferred bidder for the Lancashire Waste Management Partnership Privately Funded Infrastructure Project, in the United Kingdom and, within Australia, for the Western Region Waste Management Group Project in Melbourne.

The Lancashire Waste Partnership PFI Project, one of the largest waste undertakings in the UK, is an integrated network of waste treatment facilities.
Global Renewables, in consortium with its partners, will build own and operate these facilities under a 25 year contract.

The Lancashire Waste Partnership PFI Project will:

- *Process enough household waste to fill Perth's Subiaco Oval to the roof every 6 months or bury Monaco in 22 level metres of rubbish*
- *Process the waste for 1.4 million people, equivalent to the entire metropolitan population of Perth*
- *Remediate land and create woodlands 2.5 times bigger than King's Park in Perth*
- *Recover enough steel to produce 10 Sydney Harbour Bridges*
- *The aluminium recovered will save enough electricity through recycling to power the lights of the MCG for over 3,500 years*
- *Recover paper equivalent to a phonebook that would stretch around the Earth 1.8 times at the equator*
- *Recover enough glass to produce around 120 pint glasses for every adult in Australia.*

4. Addressing the Terms of Reference

The terms of reference to the Inquiry designate five key issues for examination which are considered critical to the scope of the Inquiry. These are listed below, together with GRD's views which, as previously stated, are drawn from seven years of research and practical experience in developing the UR-3R sustainable urban waste management solution.

4.1 Key Issue: The economic, environmental and social benefits and costs of optimal approaches to resource recovery and efficiency and waste management for municipal solid waste.

In 2004 GRD Limited commissioned Nolan-ITU to carry out a Triple Bottom Line Assessment of the UR-3R Process® with the overall aim to identify the economic, environmental and social performance of the process. It did this by addressing the cost/benefit of each aspect of performance – economic, environmental, and social – and then combining them for an overall net result.

Nolan-ITU is a sustainability consultancy with expertise in the waste/resource arena, and was selected because it has a long track-record of working with and for a variety of environmental technology proponents, Federal and State Governments, major corporations, local Councils, local communities, and environmental; non-government organisations.

In commissioning the project GRD requested it be conducted as a fully independent study. The study, a copy of which is attached to this submission, modeled the operation of UR-3R facilities across Australia's major population centres.

The triple bottom line cost/benefit analysis indicated a very significant net benefit from the UR-3R Process® to the community of $130-$150 per household per year in Australia's major population centres.

When summed over the total number of households in the major population centres modeled, the annual net benefit from the UR-3R Process® over landfill disposal amounts to $159 per household per year in Australia's major population centres, or $741 million per year for Australia.

When applied to each major population centre, an estimated 353,000 tonne per year of dry recyclable materials would be diverted from landfill and recovered for recycling by the UR-3R Process®. The processing of mixed waste through UR-3R facilities would therefore increase Australia's recovery of dry recyclable materials by an estimated 42% (ie. from 847,000 tonnes per year to 1.20 million tonnes per year).

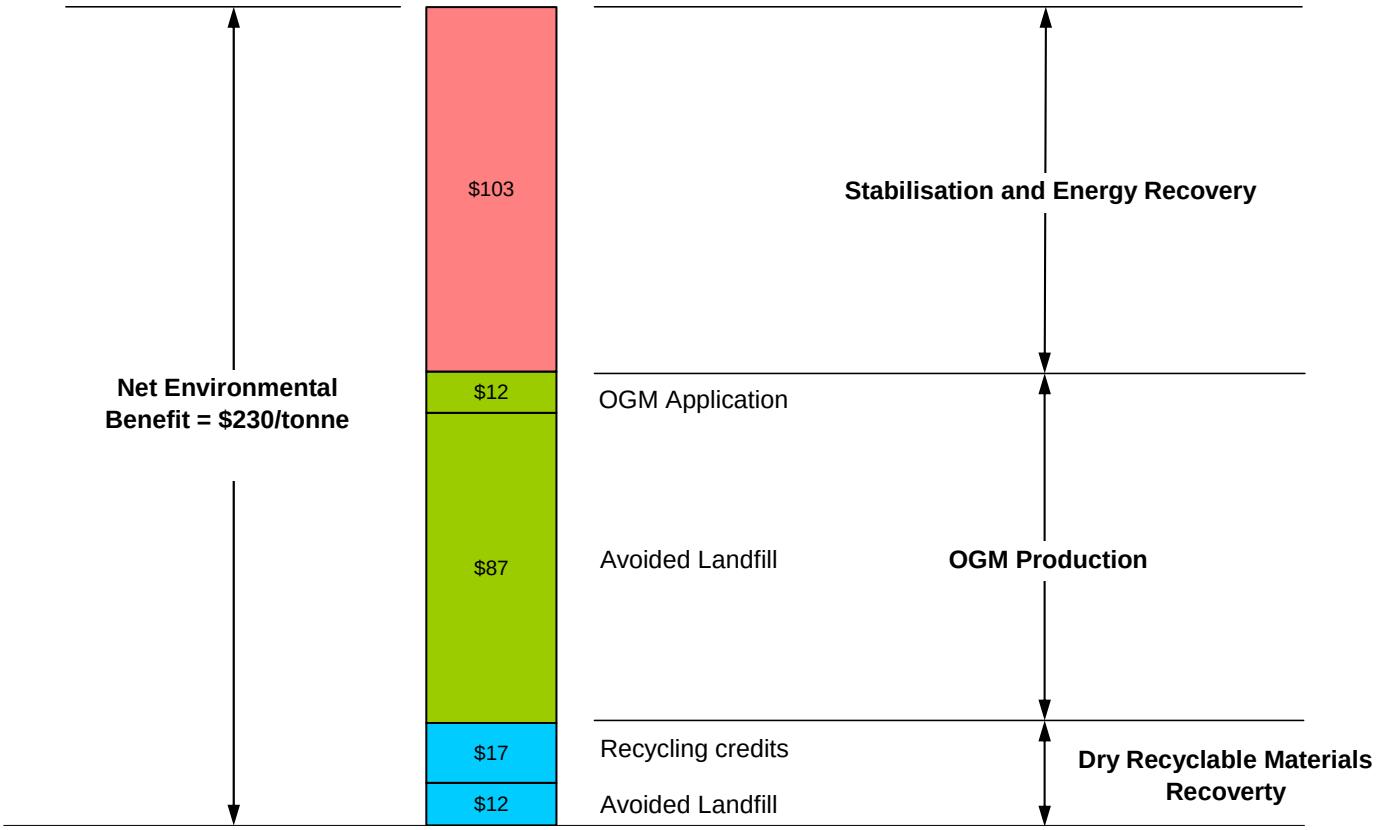
In addition the analysis of social indicators provided a positive result – the UR-3R Process® is clearly preferred to landfill disposal in terms of social indicators including social cohesion and quality of life.

In order to compare the UR-3R Process® against a baseline, the study needed to determine the environmental cost of the landfill disposal of putrescible waste in Australia's major population centres. It was determined that the annual environmental cost of landfilling of putrescible waste in Australian major population centres may exceed $640 million per year.

This costing includes air emissions from best practice landfill, leachate from best practice landfill, and greenhouse gases from best practice landfill.

In comparison, the cost of salinity (according to Commonwealth Government estimates) to Australia amounts to $243 million per year. Nolan-ITU also estimated that on a State by State basis, the environmental cost of landfilling putrescible waste could potentially be as high as follows:

NSW	$238 million
Victoria	$132 million
Queensland	$124 million
South Australia	$50 million
Western Australia	$90 million
ACT	$9 million



Net environmental benefit
UR-3R Process® versus landfill disposal contribution by process per tonne of input

This theme was identified in one of the key findings of *The Public Accounts and Estimates Committee Report*, in Victoria in 2005, which states that:

> *Pricing decisions being made by landfill operators may not be indicative of the true cost of landfill operation in the long term.*

This document goes on to say:

> *Lack of accessible and competitively priced alternatives to landfill can be the greatest obstacle to resource recovery. Landfill disposal is sometimes discounted below the full costs required to cover site rehabilitation and aftercare. Where this occurs, it is difficult for recycling services to successfully compete.*

And further:

> *Despite the work being done by the EPA in conjunction with the ICAA and the Commonwealth Department of Environment and Heritage, the Committee believes the prices charged at landfills do not take account of the full cost of operating a landfill (including site remediation and after care). The Committee believes that this is acting as a barrier to the development of economically viable landfill alternatives.*
>
> *The Committee noted for example, that the financial statements of all landfill operators do not make provision for site remediation and after care. If these expenses are significant, but not factored in to pricing decisions, then the current differential between the price paid to deposit waste in landfill and the cost of alternatives is unrealistically large.*

As indicated above, the Nolan-ITU report quantified the costs of landfill not included in calculations of waste disposal pricing. They estimate the long-term environmental costs of leachate and landfill gas emissions at significantly more than $150 per tonne of municipal solid waste disposed of to best practice landfill. These are hidden environmental and social costs not reflected in current landfill prices. Some of these costs are borne by our community as environmental impacts, and some will be borne by future generations. In addition, where remediation is necessary, the responsible councils or state governments will carry this liability.

The cost structures of alternative waste treatments, including the costs of the higher standards imposed on such facilities, can result in higher gate prices than current land fill prices. When the external costs of best practice landfill, as identified by Nolan-ITU, are included, however, alternative waste treatments can be implemented at around half the total cost per tonne of waste processed, compared to landfilling.

Councils are still relying on the landfill gate fees, however, as the only cost they need consider when making decisions on how to manage their municipal solid waste. This is evidenced by the recent applications by groups of Sydney councils to the ACCC for authority to sign long term agreements for the disposal of waste to landfill. Such agreements preclude the adoption of alternate waste treatment and, in the light of the inadequate pricing regime of landfill operators, are anti-competitive by nature.

While effective alternative waste treatments solutions are very recent in Australia, they now exist and the regulatory regimes must adjust rapidly to ensure that such solutions can be implemented and not prevented by anti-competitive long-term commitments to landfill disposal.

4.2 <u>Key Issue:</u> Institutional, regulatory and other factors which impede optimal resource efficiency and recovery and optimal approaches to waste management, including barriers to the development of markets for recovered resources.

Environmental Protection Agencies in the Australia States have traditionally focused on landfill as the only practical way of dealing with household municipal solid waste. This view has developed due to the lack of real alternatives.

A fully integrated resource recovery option was not available in Australia prior to the development of the UR-3R Process® by Global Renewables Limited.

Our first UR-3R Facility has been operating in Sydney since September 2004 and is processing 175,000 tonnes of municipal solid waste per annum, with approximate diversion rates from landfill of 70%. European and UK parliaments have passed legislation to phase out landfill disposal for municipal solid waste, made possible by the availability and proven viability of alternative waste technologies.

In Australia the legislation, policies, regulation, guidelines and strategies of state governments and environmental agencies have also focused on landfill, as this has been the primary method of disposal of municipal solid waste, and have not yet been adapted to accommodate alternative waste technologies.

We suggest that the Productivity Commission's Inquiry should recommend changes to the way in which landfill is assessed, regulated and valued so that:

- The external (hidden) costs of landfill will be fully accounted for by Local Government when evaluating landfill and alternative waste strategy competitive tenders.
- The legislation, policies, guidelines and strategies surrounding waste disposal will remove the assessment differential, which currently exists, and that assessment will be made on a fair and reasonable basis.
- Market mechanisms and incentives that favour resource recovery over landfill disposal are developed and implemented.

Now that commercially viable and environmentally superior methods, for processing municipal solid waste, are available, it is time for new policies to be established that provide guidance on alternatives to landfilling, based on the triple bottom line framework.

As Regional Waste Management Plans are required to provide a schedule for landfill disposal, they should also schedule facilities for resource recovery, recycling, treatment and disposal of residual household waste from alternative waste technologies facilities.

State Governments, which are committed to sustainability, need to clearly communicate that landfilling is not the long term planning direction for the management of municipal solid waste, and that alternative waste technologies, which focus on resource recovery, have the capacity to greatly reduce environmental emissions when compared to even the best landfill practices. Currently, and somewhat perversely, regulations that dictate the design or control of alternative waste processing inconsistently take a more rigorous approach to environmental management when compared to the regulations for landfilling.

Failure to factor in the differential costs imposed by these two blatantly inconsistent regulatory regimes will result in the continuing preferential treatment of landfills as opposed to alternative waste technologies. This will result in the delivery of an inferior outcome for the environment and for the national economic benefit.

The prices paid to consign waste to landfill are still relatively low in Australia (particularly when compared to the United Kingdom), although this varies from State to State depending on the availability of suitable sites. For example, Victoria is relatively inexpensive, while in NSW the increasing scarcity of landfills, in close proximity to Sydney, is driving up the cost of such disposal due to the higher cost of transport. Also, landfill levies, at $21 per tonne and due to increase by $30 per tonne over the next five years, are significantly higher in NSW than in Victoria where the current levy is $6 per tonne.

Direct financial comparisons of the treatment costs of landfill and alternative waste technologies ignore the environmental damage and waste of resources that result from landfilling. In circumstances where alternative waste technologies and landfill compete for business, as will increasingly be the case in all major Australian cities, landfill starts with a profound and unfair cost advantage (due to differential cost imposed by two different regulatory regimes) at the expense of the environment and the community.

This is a classic example of market failure, where government intervention is justified for the benefit of the environment, the economy and the people of Australia.

4.3 Key Issue: The adequacy of current data on material of flow and relevant economic activity and how data might be more efficiently collected and used to progress optimal approaches to waste management and resource efficiency and recovery.

As far as GRD is aware, the independent study as commissioned from Nolan ITU (of which a copy is attached) is the first comprehensive attempt to aggregate and analyse data about waste collection and disposal from all major Australian population centres.

This is an obvious need to upgrade the collection of quality data to support the introduction of more effective public policies to transform a large part of our future waste streams to resources.

Additional information on the externalised environmental costs of landfill would assist householders and decision makers assess the true costs and benefits of disposal versus resource recovery form municipal solid waste

4.4 Key Issue: The impact of international trade and trade agreements on the level and disposal of waste in Australia

As the world moves to transforming municipal solid waste into soil products it is essential that these materials be classified as soil conditioners, mulches and organic fertilisers based on the quality of the end product, not the source of the inputs. Artificially classing these products as ‘industrial waste’ based on their source will unnecessarily restrict their application (and hence the development of an organic fertiliser market in Australia) and run the risk of these products being captured by the Basel Convention, thus preventing their trade across national boundaries.

This will be an important factor in developing markets for waste derived organic fertilisers and also for Australian alternative waste treatment technologies penetrating markets in such as Singapore, Hong Kong and Taiwan where there is limited agricultural land to absorb organic fertiliser products, which may need exporting to neighbouring countries.

4.5 Key Issues: Strategies that could be adopted by Government and industry to encourage optimal resource efficiency and recovery

4.5.1 GRD suggests that adopting a policy of banning all putrescrible and recyclable waste to landfill in Australia by (say) 2010, supported by transitional step targets and addressing also the regulatory inconsistencies identified in 4.2 must be the first step towards an ultimate goal of zero waste.

4.5.2 A working model of an incentive scheme to drive the targeted outcomes in Australia is the Landfill Allowance Trading Scheme (LATS) adopted in the United Kingdom, which facilitates the achievement of waste diversion targets through a cap and trade system only accessible by local government. The local government councils that can most economically introduce resource recovery technology to exceed their LATS targets can trade their excess credits, while those which do not meet their targets can either purchase landfill credits from other councils or face a substantial penalty. Similar cap and trade markets have been established in Australia in the case of renewable energy certificates and salinity credits.

4.5.3 A government sustainable infrastructure fund would help to facilitate the necessary urban waste infrastructure development.

Allocating funds to stimulate the development of sustainable waste and other infrastructure throughout Australia and supporting local government transition towards processing household waste is essential.

An excellent example of government policy and regulation that is used to deliver higher quality and more cost effective waste management services is the Private Finance Initiative (PFI) Scheme in the United Kingdom.

The PFI Scheme achieves positive outcomes by directly involving the private sector in asset provision and operation – which changes the focus away from the procurement of capital assets, to access to, and use of, a serviced asset by the public sector.

The PFI approach recognises that the private sector takes the business risk (and that significant capital is invested) in committing to supply the service (for contracted levels of payment). As such, the United Kingdom central government has set aside funds for allocation to specific projects for the purpose of ensuring appropriate provision of sustainable waste management initiatives across England. During the 2004–2006 period, GBP135 million will be made available (in the form of PFI Credits) in respect of which local authorities may bid for “projects” to receive revenue support.

The PFI process requires that projects seeking revenue support are first submitted to the central government for review against a specific “framework” before a local authority can commit to it. This framework is designed to ensure that all procured projects are affordable, deliverable, will achieve

service delivery goals, will provide value for money, and are consistent with policy priorities (such as the United Kingdom Waste Strategy 2000). Successful projects will then be endorsed as being eligible to receive revenue support (in the form of PFI Credits), and the local authority can then proceed to procurement.

A PFI Credit effectively provides an assurance that once the contract is signed, there will be subsequent payment of revenue in support of the project. This process is efficient and effective, in that it ensures both the private and public sectors do not waste resources in promoting and procuring projects that will ultimately not be supported and will not go ahead.

The procurement phase of the PFI process is not unlike the tendering process in Australia, in that a local authority will seek to purchase a capital intensive service from a private sector provider over a long term period. The private sector provider is paid for the performance of the service in accordance with specified levels of performance and/or usage of that service. The private sector provider is responsible for the investment in capital assets, financing that investment and ongoing operation and management of the facilities to provide the specified levels of service.

In summary, the PFI and LATS schemes are a well structured approach to fostering public private partnerships as a means to implementing capital intensive infrastructure projects that enable the achievement of planned targets while delivering cost effective public services. More importantly, the PFI and LATS schemes are designed to provide greater certainty for both the private and public sector during project procurement, and in doing so, addresses the market and regulatory failures that otherwise exist in the context of the waste management industry.

GRD suggests that a funding and market based policy approach similar to the PFI and LATS should be used to drive more positive government policy and regulatory intervention in Australia to remove the hurdles faced by the proponents of sustainable waste management technologies.

4.5.4 Nationally targeted research, education and market development programs are required to develop a public awareness of, and support for, the transformation of waste to resources and to facilitate the process.

The message of waste to resources should be linked with sustainability and top the highly developed public awareness of all issues concerning the environment.

In addition, research, education and development programs are required specifically to develop agricultural markets for compost and organic fertilisers produced by alternative waste treatment facilities.

GRD has recently received AS4454 certification for the composts, soil conditioners and mulches it produces for the Eastern Creek UR-3R Facility.

Achieving broad scale use of composts and organic fertilisers in agriculture as a substitute for inorganic chemical imports, however, will require research, field trials and education to demonstrate the benefits and create an economically viable market to stimulate further industrial and agricultural

growth in Australia. This could also enhance the 'green' brand for our agricultural produce, particularly for the European market.

Significant research is taking place to identify and quantify greenhouse gas emission reductions in the farming sector. Current science is pointing towards a formula of at least one tonne of reduced greenhouse gas emission for every tonne of organic/carbon material substituted for superphosphate/chemical usage.

Global Renewables is committed to developing a composite organic product as a substitute for the superphosphates and other chemical additives used in broadacre farming and other high volume agricultural applications. This initiative is important in the context that superphosphate is extensively required for farming in Australia – and therefore a composite product is needed to achieve the volumes, productivity and mix of carbon and organic ingredients. Global Renewables, however, does not have the resources alone to undertake all the activities required to develop a comprehensive market for organic fertilisers in Australia. A conducive policy framework together with government incentives and funding for research, education and market development are required.

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Attc: *National Benefits of Implementation of UR-3R Process®, A Triple Bottom Line Assessment, July 2004* – Nolan-ITU Pty Ltd